Azizul Hassan   *Editor*

Technology Application in the Tourism and Hospitality Industry of Bangladesh

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Introduction

Digital technology has experienced rapid development in recent years, and this has helped the global tourism industry to move forward. There is increasing evidence of the integration of innovative technology application with the tourism industry. It is almost impossible to think about a developed tourism industry without technological support. Such integration makes the use and availability of technology easier for tourists. Tourists at present have more options and choices around the world.

Technology application allows tourists to collect relevant information and data from Internet-based sources. Such collection happens prior to their decision making (i.e., local culture, weather, cuisine, environment, etc.) about the possible holiday destination. These tourists can confirm hotel bookings and obtain information about local transportation and eateries to provide them a hassle-free holiday. Also during the holiday, either by browsing the available websites or with the use of apps installed on their Smartphone, tourists can learn about the destination, local attractions, accommodation standards, etc. Global Positioning System (GPS) as the digital route map allows tourists to roam around with ease. With the support of technology, tourists now very rarely face natural disasters or unexpected situations. Without the use of technology, tourists would be unaware of necessary itineraries and would not enjoy their holiday to the same extent. Such popularization of innovative technologies is indebted to specific tourist segments.

Generation Z and young tourists are motivated to get involved in tourism activities through innovative technologies. These tourists tend to opt for adventure tours, and take trips to previously unexplored destinations. In addition, they are interested in visiting remote destinations to experience tour expeditions under the sea, scuba diving, cruising, snorkeling, etc. Generation Z are mostly school, college or university students from many parts of the world who subscribe to the "learning by travelling" philosophy. These young tourists, with the support of innovative technologies, are more concerned about the potential of the destinations. They also attain considerable knowledge about tourism from their academic studies and activities. In addition, they are capable of collecting data and relevant information on low-budget destinations. In the current digitalized age, older tourists are also able to take advantage of out-of-the-way tourist destinations with confidence. The application of

innovative technologies can thus turn into positive support for tourism business entrepreneurs. From the tourism products and services perspective, tourism entrepreneurs can create more offers. They can add attractive features to these offers with the aim of drawing the attention of an increased number of potential tourists. These entrepreneurs allow tourists to be the product and service consumers while booking their preferred package holiday offers, as well as to get the best bargains, and to give immediate feedback on the received services. Marketing publicity and promotional activities of the tourism industry at present mostly depend on digital technology. An update on a tourism product or service offer can now reach millions of tourists through social media networks such as Facebook, Twitter, YouTube, etc. All sorts of tourists, ranging from youth to seniors, use social media platforms. Tourists can also write and share their innovative nature views, ideas, and opinions on social media. This writing and sharing with the support of digital technologies benefits the development and promotion of the tourism industry. As in developed countries, tourism business entrepreneurs and the Government of Bangladesh (GoB) also stress digital technology application for both marketing and promotional purposes in the country. Previously, this was almost impossible in a South Asian developing country like Bangladesh.

The tourism industry in Bangladesh as a South Asian country has potentials. Sustainable development of this industry in Bangladesh is on the move. Nevertheless, some hindrances appear to be stymieing this industry's overall development potentials. Overcoming such hindrances could be partly achievable with the support of digital innovation and more Internet-based platforms in the tourism industry of Bangladesh. In many countries, this industry has experienced considerable development in line with the effective application of digital technologies. This application allows product and service offers to reach millions of potential tourists in seconds. These tourists are also able to make choices regarding the desired tourism product and service offers from online platforms. The use of paper is diminished with the use of technology, which makes it eco-friendly and sustainable to reach the set goals.

The tourism industry can play an important role in achieving the Sustainable Development Goals (SDGs), as SDG 8, 12 and 14 are directly involved with tourism. Digital technology application supports the development of the tourism industry in the most unique way. Several tourism business entrepreneurships have thus developed local and young community engagement. Such engagement gradually leads to the generation of employment and reduction of poverty in both urban and rural areas with the support of innovative digital technology. These are contributing to the GoB's efforts to achieve the SDGs through the adoption of the tourism development-focused National Tourism Policy (NTP).

The existing NTP-2010 of Bangladesh arguably presents useful directions in which to apply digital technology for the country's tourism promotion and development. Budgetary allocation of the GoB is also said to have increased significantly in this regard. In collaboration with the a2i (Access to Information), the Bangladesh Parjatan Corporation (BPC) has initiated several programs to brand and to create awareness about the tourism industry of Bangladesh on various YouTube channels. However, these have mostly been discontinued. In theory, both the Bangladesh

Tourism Board (BTB) and BPC are keen to ensure online services for tourists at all of its hotels and motels that include booking, payment and upgradation on their website. BPC has also installed a "Grievances Redress System" (GDS) for accepting complaints and addressing them. Tourists at present are able to lodge complaints and can send feedback to the BPC from anywhere. In addition, digital initiatives are in place for resolving any issues that are faced by tourists. However, the success and effectiveness of these initiatives are often questionable, which necessitates the publication of this book.

This is evident that a good number of research studies are conducted outlining the contributions and importance of tourism including the Caribbean and many other developing countries. However, researching technology application in the tourism industry of Bangladesh so far has attracted very few researchers. Very few and insufficient contributions are made.

With the consideration of the ongoing technology-savvy trend in Bangladesh, this book is a significant contribution towards the very limited knowledge in this identified research area. The book is designed to accommodate research studies that outline the present technology application scenario of Bangladesh in order to suggest some promises. In nine parts (i.e. concept and context; the present scenario; product and service offers; role analysis of public and private institutions; social media, networking and connectivity; sustainability practices and climate change effects; tourist experiences; developments; and challenges, suggestions, and future research directions), each of the 22 chapters is rich in content, methodology and arguments. Summary of the chapters is presented as follows:

In Chap. 1, Deb proposes the eTourism Adoption Model (eTAM) in the Bangladesh perspective. According to the author, eTourism as a phenomenon has been closely related to Information and Communications Technology (ICT) and tourism for at least three decades. Highlighting the importance of ICT in tourism, the chapter assesses and examines a conceptual framework of technology acceptance models and then proposes eTAM in the context of Bangladesh. This model is developed with the unique application of secondary and primary data.

In Chap. 2, Avi and Hassan outline the Diffusion of Technology (DOI) of Rogers (1962) and then apply its relevant examples to the tourism and hospitality industry in Bangladesh. The authors contend that the DOI could serve as a valid and relevant concept for tourism marketing and technology application research. This chapter focuses on the key features and stages of this theory and presents a specific reference to its application in Bangladesh.

In Chap. 3, Roy and Salimullah propose tourism technology as one of the evidential factors in the growth of tourism in this rapidly changing, advanced and globalized world. This research aims at investigating some diverse product/service segments of technology application in this industry. In addition, this research focuses on technological strategies for assisting the tourism business in Bangladesh. This covers earlier discussions in a concise summary of some key marketing points to promote potential tourism technologies. The chapter examines some diverse tourism technological products and services.

In Chap. 4, Bappy and Avi critically analyze the application of technological innovation in the tourism and hospitality industry of Bangladesh. According to the authors, policy, structure, strategy and the role of the global tourism and hospitality industry are altered by the application of Innovative Technology (IT). With successful application, IT could be the key driving force to increase the competitiveness of the tourism and hospitality industry. On these grounds, this chapter aims to explore how innovative technological application can support the development and investment of this industry. The chapter then offers a brief overview of this industry, coupled with the degree to which IT can be adopted by the relevant stakeholders.

In Chap. 5, Avi, Nasrin and Hassan discuss the existing scenario of innovative technology application in the tourism and hospitality industry of Bangladesh. The chapter creates a conceptual link between tourism and hospitality, innovations and technologies. It then concentrates on describing the importance and implications of technology application in this industry. The chapter provides some recommendations for stakeholders of this industry to help them make the best use of technology.

In Chap. 6, Khan, Anika and Hassan present the application of innovative technologies in the tourism industry of Bangladesh. This chapter discusses how innovative technology application facilitates the reduction of costs, boosts productivity, improves services and supports the creation of an environment congenial to new entrepreneurship and innovation in tourism industry. This chapter aims to explore whether the application of innovative technology can help in the development of a new dimension in the Bangladeshi tourism industry.

In Chap. 7, Ananya discusses the application of technology in agri-tourism in Bangladesh. The author features agri-tourism as a tourism type that has rapidly gained popularity by offering enormous opportunities for the producers, generating more income, and direct marketing. Bangladesh is an agricultural country with huge potential for agri-tourism. The author affirms that agri-tourism can be presented as a selling point. Comparative advantages can be generated from agriculture for the tourism industry in Bangladesh, as agriculture is the combination of three revenue-generating sectors (i.e. agriculture, industry, service). In rural areas of the country, agricultural product marketing is difficult due to the lack of advanced technologies. This chapter covers the present status of technology application along with the aptitude for agri-tourism business in Bangladesh. The chapter also features the reasons that agricultural attractions demand technologies (i.e. devices, software, Android apps, etc.) for tourists.

In Chap. 8, Hassan deals with the role of Social Networking Sites (SSN) in shaping university students' attitudes towards ecotourism in Bangladesh. This research aims to identify the antecedents of attitudes and intention towards ecotourism with the use of SNSs. The author confirms that the importance of social networking proliferates in the tourism industry. However, limited studies have been conducted outlining and predicting attitudes towards ecotourism in the context of SNSs. Thus, this research is carried out as an extension of the Technology Acceptance Model (TAM) in the wider context of university students of Bangladesh. This rigid statistical data analysis-based research applies the bootstrapping technique.

In Chap. 9, Mohiuddin and Sajib apply Information Technology (IT) to indigenous gastronomy and tourism development in the Chittagong Hill Tracts (CHT). The authors argue that at present, IT is a useful element for tourists, and offers opportunities for promoting indigenous gastronomy in the tourism industry. The authors reveal that the CHT is inhabited by 11 indigenous communities, featuring it as a region with multi-ethnic gastronomy, cultural diversity and beautiful ecological setting in South Asia. In CHT, tourists tend to appreciate "primitive" dishes that represent the indigenous food culture. Thus, this chapter methodologically employs ethnographic approaches for collecting data from the field with the use of in-depth interview, Focus Group Discussion (FGDs), case studies, and Key Informant Interviews (KIIs), and analyses the application of information and communication technologies for the promotion of indigenous gastronomy in the CHT.

In Chap. 10, Islam and Sajib discuss about technology supported tourism in the Buddhist Vihara at Paharpur in Bangladesh. This research aims for understanding the likely application of Augmented Reality (AR) as an innovative technology in this religiously important tourist site in Bangladesh. The Buddhist Vihara at Paharpur World Heritage Site (WHS) is attached to the Buddhist religious culture and customs. This mixed method research outlines sustainability issues that can generate from AR application. This research finds that tourists visiting this religiously important site are typically keener for knowing its cultural background and richness with local community engagements.

In Chap. 11, Pramanik, Rakib and Hassan assess the perceptions of the stakeholders and tourists for implementing AR application that has promises in the cultural, heritage and museum background. This qualitative research takes the case of the Buddhist Vihara at Paharpur of Bangladesh, a sacred and religiously important tourist site. The study with the deliberation of AR and AR application in tourism, identifies the reasons to apply this modern technological tool in this real world setting. Necessary elements to implement AR in this site are also revealed and analyzed.

In Chap. 12, Alauddin and Hassan elaborate in depth the application of technology for visas and immigration for tourists in Bangladesh. The authors argue that the tourism industry has become a reliable source of generating revenue and foreign currency. Advancements in information and communication technology (ICT) benefit tourists by making global travel easier than ever. In many countries, visa and immigration systems have adopted online-based technologies. This chapter stresses the importance of applying modern technologies in this industry.

In Chap. 13, Tripura and Avi analytically explain the role of public and private institutions in terms of applying innovative technologies in the tourism and hospitality industry of Bangladesh. According to the authors, the usefulness of technology applications in this industry is well recognised all over the world. However, the role of public and private organisations associated with this industry is yet to be well clarified.

Chap. 14, by Nowreen and Hossain, presents the role of Social Media (SM) as an element to motivate tourists in Bangladesh. The authors argue that SM and the Internet have effective interrelationships. The application of SM in the tourism industry can be viewed as significant where SM has influenced almost every aspect

of tourist activity. Travel agencies support the flourishing tourism industry with its user-friendly attributes. The authors state that, recently, SM has influenced the tourism industry of Bangladesh, and thus this chapter depicts the role of SM in motivating tourists, which is further analyzed from data and information collected from 200 university students aged between 18 and 24 years from three public universities.

In Chap. 15, Rakib and Hassan present social media as a technology-supported enabler of tourism promotion in Bangladesh. The authors state that social media in recent years has transformed into a unique tool for social interaction. This is mainly due to the development and expansion of users' communication range. Social media, according to the authors, creates more scope for users to interact. As long as the capacity of social media expands, tourism as an industry will also benefit. Such influence, with the support of relevant stakeholders and tourism administration, can thus promote tourism in a positive way. In this context, this research outlines the interaction between social media usage and tourism promotion. The chapter focuses on tourism stakeholders and tourism administration in Bangladesh.

In Chap. 16, Roy, Kuri, Ananya and Hassan examine the various social media channels available, their applications in tourism, and their efficacy, benefits, and potential challenges in Bangladesh. The chapter also analytically explains different aspects of technology applications in the tourism industry.

In Chap. 17, Hossain, Rakib and Hassan emphasize on climate change as the buzzword of the past decade to attract the attention of researchers and academics. Climate change can result in depletion of water supply and quality. Negative effects can result in warmer water temperatures and pollution. Thus, the authors believe that countries with closer proximity to the sea, including Bangladesh, will be particularly vulnerable to global climate change. On the basis of both primary and secondary data, this study outlines climate change effects on the tourism and hospitality industry in Bangladesh.

In Chap. 18, Mohiuddin, Uddin, Nowreen and Nahian explain climate change effects and sustainable tourism products and services through innovation in Bangladesh. The chapter shows that global climate change (CC) is as a challenging issue for every sector of the economy. Tourism is not an exception to this because of the adversity of the impact of climate change on Bangladesh as a disaster-prone country. Indeed, in many cases, this industry can be viewed as the greatest victim of CC. Thus, this chapter presents the impacts of CC on tourism in Bangladesh with some potential strategies for sustainable tourism development. This chapter performs a thorough systematic review of peer-reviewed journal articles, reports by tourism policymakers and civil society dialogues to outline the likely adaptation strategies by Bangladeshi tourism industry stakeholders for making it more sustainable.

Chapter 19, by Rahman and Hassan, discusses tourist experience and the application of technology in Bangladesh. The chapter states that technology application in the tourism and hospitality industry can have both direct and indirect influences on tourist experience when Bangladesh has diversity in its tourism and hospitality industry. Advanced technology application incorporates inimitable dimensions and allows tourists to become more technology-oriented for information collection

about the required products and services. Research studies are conducted in the tourism and hospitality industry to cover tourist experiences with technology application. However, the authors discuss the need for more contributions to this very specific research area. Thus, against the tourism and hospitality industry background of Bangladesh, this review chapter broadly emphasises tourist experiences using innovative technologies.

In Chap. 20, Ananya outlines the experience of tourists with the application of technology in the tourism and hospitality industry in Bangladesh. The author claims that the advancement of civilization is partly related to the development of technologies in fulfilling peoples' demands. This chapter thus identifies tourist experiences through the application of innovative technologies, and explores the interaction of technology with the industry, offering some suggestions.

In Chap. 21, Rahman and Saima discuss the application of technology in the tourism industry of Bangladesh for socio-economic development. The chapter begins by arguing that the application of technology has appeared as a general feature of the global tourism industry, but in Bangladesh, the providers of tourism services are using comparatively less competitive and cutting-edge technologies. The authors state that the actual contributions from the use of such technologies are still unexplored in Bangladesh, mainly because of the lack of necessary data and empirical information. In this context, the chapter focuses on explaining the use of innovations and technologies in the tourism industry of Bangladesh. It also outlines the way in which such revolutionary technologies are affecting the socio-economic development of the country.

In Chap. 22, Avi and Sardar discuss the challenges of applying innovative technologies in the tourism and hospitality industry of Bangladesh with propositions for overcoming them. The authors describe the application of Innovative Technologies (ITs) in the tourism and hospitality industry and find the use of digital and innovative devices to fulfil multiple functions. Bangladesh has made steady progress in technological innovation. However, the application of technologies is in its early stage. This research thus identifies the challenges and issues of this industry in applying ITs in its business operation.

This book is a useful contribution to the expanding tourism literature in Bangladesh. It can be used as a reading companion mainly for tourism students in higher academic institutions in Bangladesh. This book can also be read by policy planners and industry professionals. In addition, this book is expected to be appreciated by expatriate researchers and PhD researchers on Bangladesh with a keen interest in the tourism industry of Bangladesh.

London, UK   Azizul Hassan

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Part V   Social Media, Networking and Connectivity

Contributors

Md. Alauddin has been working as an Assistant Professor (Study Leave) of Marketing in International Islamic University Chittagong, (IIUC) Bangladesh. He has completed his BBA, MBA, MPhil degrees in Marketing from the University of Chittagong, Bangladesh. He is now doing PhD in marketing from the City University of Hong Kong, Hong Kong. His research contribution and interest are in the field of Service Quality, Tourism Marketing, Strategic Marketing, Branding, and Customer Engagement.

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Dr Santus Kumar Deb is currently an Associate Professor in the Department of Tourism and Hospitality Management, University of Dhaka, Bangladesh. He earned his PhD in Service Management and Erasmus Mundus Scholar. He earned Executive Program in Strategic Digital Marketing (EPSDM) from University of Cambridge and learning partner UpGrad. He also earned Post Graduate Diploma in Supply Chain Management, MBA in Marketing. His core subjects are Marketing, eTourism, Service Management, Sustainable Tourism, Digital Marketing, and Logistics. Deb is a regular reviewer of Journal of Public Health (Springer), Journal of Hospitality and Tourism Insights (Emerald), South Asian Journal of Marketing (Emerald), and other international journals. He conducted classes in Vincent Pol University Lublin, Poland as a visiting professor. He has many International publications in the era of business and tourism in renowned journals.

Dr Azizul Hassan is a member of the Tourism Consultants Network of the UK Tourism Society. Dr Hassan has been working for the tourism industry as a consultant, academic, and researcher for over 20 years. His research interest areas are technology-supported marketing for tourism and hospitality, immersive technology applications in the tourism and hospitality industry, and technology-influenced marketing suggestions for sustainable tourism and hospitality industry in developing countries. Dr Hassan has authored over 150 articles and book chapters in leading tourism outlets. He is also part of the editorial team of 25 book projects from Routledge, Springer, CAB International, and Emerald Group Publishing Limited. He is a regular reviewer of a number of international journals.

H. M. Kamrul Hassan studied and lectures Marketing and Entrepreneurship. Currently, he is working as Associate Professor in the Department of Marketing, University of Chittagong. Hassan has completed his graduation and post-graduation in Marketing from the University of Chittagong. Recently he finished his second Masters in Asian Institute of Technology, Thailand, where his research study is on Social Entrepreneurship. He attended many local and international conferences in Bangladesh, India, Malaysia, Thailand and the Czech Republic. His principal interest in teaching is developing, using, and disseminating comprehensive, affordable teaching and business education platforms to be maximized both by faculty members and students for which he has been experimenting with different stakeholders. He regularly writes on business in academic and non-academic journals and newspapers.

Kazi Faruk Hossain is Assistant Professor of the Institute of Education and Research (I.E.R.), Jagannath University, Dhaka, Bangladesh. He has completed Master of Education (Specialization in Curriculum and Instructional Technology) and Bachelor of Education from the Institute of Education and Research, University of Dhaka. He has been working as a researcher in EIA-DU-OU collaboration program at the Institute of Education and Research (I.E.R.), University of Dhaka (DU). He is also pursuing his Master of Philosophy (MPhil) from the same institution under EIA-DU-OU (UK) Research Collaboration Programme. He worked for Plan International Bangladesh as Deputy Area Coordinator and completed five Govt. funded research projects. He has six published research articles in the reputed journals and has a special interest in research on education, research, curriculum, special education, teacher training, language education, use of technology and technology in education, education management and education policy.

Md. Julhaz Hossain obtained both the BBA and MBA degree major in Marketing from the Department of Marketing, University of Rajshahi, Bangladesh. Soon after completion of his study, he joined in and started working for a renowned scheduled private bank and gained extensive knowledge in the monetary system and competency in banking operations and practices. However, after returning to academia, he is currently serving as a Lecturer at the Institute of Business Administration, University of Rajshahi, Bangladesh. His research interest covers a wide range of

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Md Yusuf Hossein Khan is currently working as an Assistant Professor at the College of Tourism and Hospitality Management (CTHM) of IUBAT—International University of Business Agriculture and Technology, Dhaka, Bangladesh. He is also a PhD Researcher at the faculty of Economics at the University of Algarve, Portugal. He has a good number of years' experience working within the tourism and hospitality industry in several countries. Khan has completed his MSc in International Tourism Management from the Cardiff Metropolitan University, UK, and MBA International from the Anglia Ruskin University, UK. Besides, being a member of CinTurs – Research Centre for Tourism, Sustainability, and Well-being of Ualg, Faro, Portugal he is also serving several International Journals as Editorial Board Member and reviewer. Khan is an expert in curriculum design and currently is an active member of the CTHM curriculum task force team of IUBAT. His current research interests are in particular, Safety and Risk in Tourism, Travelers loyalty, Tourist motivation and behavior, and Tourism destination image and development. He has a good number of publications in these areas.

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Audrika Nahian has completed graduation from Bangladesh University of Engineering and Technology (BUET), concentrating in Water Resources Engineering. She worked on Environmental Flow for her thesis under the title "Environmental Flow Assessment on Dharala River". She has an enthusiasm for software-related works. She has interests in GIS, HEC-RAS, MATLAB, C, Auto-CAD Drawing. Apart from educational interests, she also has involved herself in several research projects in her academic life.

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Dr Muhammad Khalilur Rahman holds a PhD from University of Malaya (UM). He has been actively involved in research activities and published more than 45 journal articles, and book chapters in internationally peer-reviewed journals with Web of Science, Scopus and non-indexed journals. He has a wide interest in tourism management research which includes medical tourism, eco-tourism, halal tourism, service quality, brand equity, marketing, management, supply chain management and business administration. He is a reviewer of Tourism Review, Journal of Islamic Marketing, International Journal of Tourism Cities and BMC Health Services Research.

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Part I
Concept and Context

Chapter 1
Proposing the eTourism Adoption Model (eTAM) in the Context of Bangladesh

Santus Kumar Deb

Abstract eTourism is a phenomenon that has been closely linked to the growth of Information and Communications Technology (ICT) and to understand the areas of tourism more than 30 years ago. The purpose of this study is to assess and examine theoretical framework of technology acceptance models to develop the eTourism Adoption Model (eTAM) in the context of Bangladesh. Mixed method research was applied for exploring the challenges and motivational factors for eTourism adoption. In order to propose the eTAM, this study investigated previous studies, theories of technology adoption and tourists' expectations as the bases of literature review section to develop eTAM. The research then conducted in-depth interviews of the target respondents using a semi-structured questionnaire. Based on the literature review and in-depth interview outcomes, this study identified the factors of electronic Tourism Adoption Model (eTAM). eTAM provides a basic structure of tourists' adoption of technologies to meet their demands and satisfaction. As believed, eTAM can support the concerned tourism agencies for policy making, demand and supply assessing, and guidelines for sustainable tourism development. Based on the outcome of this research, further study is recommended to measure the economic impacts of eTAM in Bangladesh and in the wider scenario of the South Asian countries.

Keywords technology · eTourism · eTAM · adoption · satisfaction

Introduction

Boston Hospitality Review (2018) stated that digitisation is one of the most significant innovations in our rapidly developing world. Digital developments and technological innovations are correlated for growth and have global impacts, especially in

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manufacturing, Information and Communication Technology (ICT), travel and tourism services, and other services industries. ICT has transformed tourism worldwide. A creative system of tourism information must provide information on various output devices and take into account the spatial milieu of the corresponding data. In the adoption of digital tourist information services (Fritsch, 2001) the user-related presentation and location knowledge will be crucially relevant ("Customisation").

Chen and Shih (2014) believed wearable technology was not a completely latest technology, but that we concentrated on the post-service era, when personal technology devices were turned into wearable gargets. The age for digital tourism areas followed by thematic parks and theme destinations – began with the advent of websites of information; but this focused flow of information was one-sided and minimal. The rapid expansion of Information Technology (IT), especially of the Internet, has provided tourist and entertainment industry opportunities. Tourism is the largest industry in the world (Sheldon, 2001). The key features of the market structure and the functioning of new technology (Inkpen, 1998; Sheldon, 1997) were studied Information-case studies were divided into all aspects of ICT applications in various areas such as hotels, travel agencies, tour operators, airlines services and etc.

E-commerce is described as the purchase and sale process or the exchange via computer networks, including Internet products, services and information, in particular (Lee & Turban, 2001). ICT is one of the main tools for e-commerce in the tourism industry and favors eMarketing as well as innovative technology marketing that mediate companies and consumers (Brodie et al., 2007). In e-commerce/e-travel/e-tourism produces one of the quickest growing instruments, for example telecom and IT, hospitality/marketing-strategic plan.

Today, the dimension of tourism has shifted which concentration in online media in replaced of the buzz of positive words, which is a big source of tourist's information. Some of them focus on awareness requirements, information bases, navigation routes and the mindset of online tourism research (Pan & Fesenmaier, 2006).

ICTs include a whole range of electronic resources that enable organizations to operate and interact with stakeholders and their knowledge, functions and processes in their efforts (Buhalis, 2003).

eTourism in particular comprises three distinct disciplines: business management, IT and tourism. Figure 1.1 indicates the concept and its regions of eTourism. In general, eTourism comprises IT, industry and tourism (i.e. eCommerce, eMarketing, eTransport, eFinance, eHRM, eProcurement, and eProduction) as well as ePlanning and eManagement in all the sectors of tourism industry (Buhalis, 2003).

In Bangladesh; tourism is rapidly recognized as a largest growing economic industries in the world as an integral contributor of job development and wealth creation, economic growth, environmental conservation and alleviation of poverty. Tourism is a key contributor to meet the sustainable development goal (SGD) in Bangladesh while the growth of tourism 90% is domestic tourists and rest of them are international tourists. In Bangladesh; online marketing and promotional activities can be the most suitable and common way to deliver products and services, promote products, and pass digital information to the target market (Rahman &
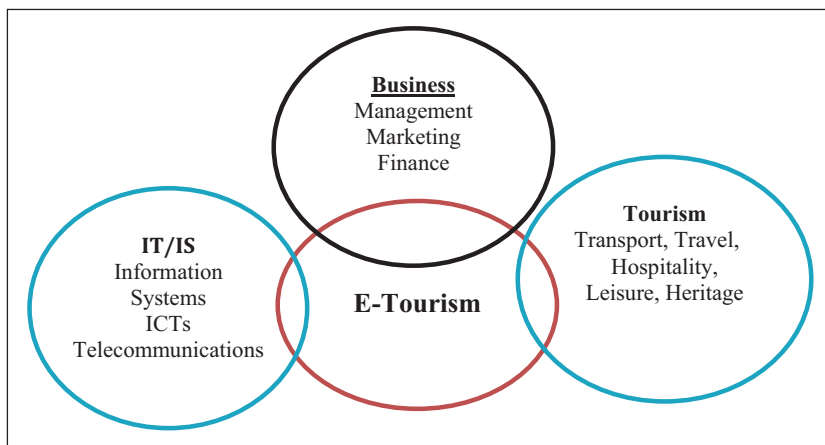
Fig. 1.1 eTourism concept and domains. (Source: Adapted from Buhalis 2003)

Rahman, 2020). During COVID-19 outbreak tourism sector is mostly affected due to travel restriction and majority domestic and international tourists order tourism (leisure and recreation) products through online that's eTourism getting popularity. During post-COVID-19, globally eTourism functions will be more popular to tourists and service providers to promote tourism products through online services at a cost effective way.

Tourism has a larger number of heterogeneous stakeholders than many others as a worldwide sector and as the largest supplier of workers on the planet. The industry's energy demand and growth is perhaps only expressed in its ICT growth (Buhalis & Law, 2008). The competitiveness of organizations is determined by e-tourism, which uses intranet systems to re-organize internal processes, extranets to conduct trading with trustworthy associates and the Internet to communicate with interest groups (Buhalis, 2003).

Buhalis and O'Connor (2005) found that e-Tourism will concentrate on consumer-centric technology to support the latest sophisticated and seasoned customers. At both the strategic and tactical levels of management, therefore, agile strategies are needed to establish "information structures that allow tourism organizations to manage their internal functions, relationships with partners and engagement with all stakeholders, including consumers". Sultana (2016) stated that Bangladesh is a naturally enrich country with world longest sandy sea beach, hilly mountains, flora and fauna, healthy weather, diversity of seasons, and technological application in tourism are key dynamics of sustainable tourism development. Despite the fact Deb (2020) found that eVisa, eTour, eReservation, eItenary, eTicketing, and Virtual tourism have statistically important and accurate characteristics for mobile applications in eTourism.

Previous researchers have discovered a significant role in tourist studies for portable technical instruments i.e. notebook, laptop, smartphone have a positive impact on E-Tourism adoption (Tussyadiah & Fesenmaier, 2009; Green, 2002).

Nevertheless, tourism industry is now facing a range of innovative challenges as a result of market and environmental shifts that are shaped by technological innovation (Buhalis & Amaranggana, 2013). Moreover, few studies have been found in the era of eCommerce, eTourism, and technology adoption in tourism but there is no study has been conducted to the technological applications in tourism with model specification for adoption. Henceforth this study reflects on the footstep of electronic tourism acceptance model (eTAM) whereas study pointed on tourists' demand from tourism industry and available supply facilities of providers through intermediaries to meet the tourists' expectation and also take initiatives to develop a eTourism value chain network based on existing technology and tourism literatures.

This study examines the key success factors of technology acceptance theoretical framework and behavioral intention towards technology adoption in tourism. To develop electronic Tourism Acceptance Model (eTAM) in terms of demand site, supply site, intermediaries' service perspective, and expectation for tourists' satisfaction; at first the study bestows earlier adopted theoretical models. The inclusive purpose of the study is to assess and comprehend the tourists' expectation and experiences regarding eTourism Acceptance Model (eTAM). Conclusively perform a mirror image from literature review, qualitative interviews with experts, and draw conclusions with implication of the study.

Literature Review

Venkatesh et al. (2003) stated that the importance to accept the innovation of technology for further development of information dissemination thoroughly to the stakeholders by using the models of technology adoption (de Souza Dias, 2002). Users can select "Digital views" to display 360 degrees of space. The first interactive web-based tour of the facility consisted of a mix of views, a lesson map and equipment information. Moreover, triangulating the satellite signal around the globe is a function of Global Positioning System (GPS). Check the e-itinerary directly, check the flight and check the flight status, including information on delay, cancelations and gate departures, in real time (Berry & Seltman, 2007).

As culture becomes interconnected, and networks become omnipresent through the use of cell phones, society undergoes a fundamental transition, none more than in travel (Dickinson et al., 2014). Tourism information is primarily geographically linked and many valuable applications with knowledge of the area can therefore be offered.

The information services offered by mobile apps show that mobile phones can alter visitor behavior. Currently; Mobile device is considered as a key device for communication purposes in the society (Balachandran & Tan, 2015). Smartphone is also an inevitable tourism partner, and a fruitful basis has been built for mobile computer tourism. Likewise; smartphone is also an inevitable tourism partner and a fertile basement electronic tourism (Cheverst et al., 2000). Buhalis and Law (2008) have established three key axes for e-tourism research: consumption and demand;

technical innovation; and business. However, qualitative results of this study displayed that the information provided on Facebook is subjective and non-representative and therefore not credible while Triposo Travel Guides (TTG) pointed out that the tour application is useful to restaurant, hotel, tourist and tourist attractions, shopping and nightlife.

M-apps can be preferred to shopping as compared to a typical mobile browser (m-browser) for several benefits. Initially; m-apps overwhelmed the mobile navigation barrier since m-apps can be customized to the users (Wang & Wang, 2010). The use of mobile applications can be optimized. Second, the advantages of "ever on", "ever on", and flexibility help foster the effectiveness of consumer day-to-day tasks (Kim et al., 2013a, b).

Figure 1.2 shows the evolution of eTourism industry whereas online application, online payment, online order, and direct shopping, virtual service and virtual process are very crucial for eTourism development to change the physical atmosphere and introduce the virtual environment. As a result, both the service provider and the consumer benefited from improved market conditions.

Customer Centric Approach of eTourism

Generally, the population travels more often is linguistically and technologically skilled and is able to work in multicultural and challenging environments abroad. The Internet helps such "new" visitors and encourages them to pursue outstanding value for time and money (Buhalis & O'Connor, 2005). New innovations in the field of tourism attempt to meet their customers with tailor-made services and also compete with other retailers and distribution networks (Tsiotsou & Ratten, 2010). One of their most frequent uses is to share their own experience through social networks such as Facebook, Twitter etc. (Buhalis & Costa, 2006). Jain et al. (2013) revealed five drivers that influenced the adoptability of e-tourism services: utility, economics, reliability, quality and security.

Almer and Stelzl (2002) found that interactive multimedia information is embedded in thematically and locally-related data and provides for maximum tourist information online and offline on a spectrum of digital media. The device integrates satellite, GPS, Geographical Information System (GIS), Terrestrial images, tourist information and multi-media, 2D and 3D visualization and interactive navigation technologies (Fig. 1.3).

The essence of the aviation industry is related to the high level of passenger-aviation processes (Egger, 2013). Starwood Hotels has introduced the Google Glass Software (Android Community, 2014) of Google Favorite Guest (SPG). During tourist exploration, local maps and other needed information will react to messages while driving. In reality, personal technology intermediates between users and objects and technologies emerge and alter human perceptions in people and the environment (Ihde, 1990).
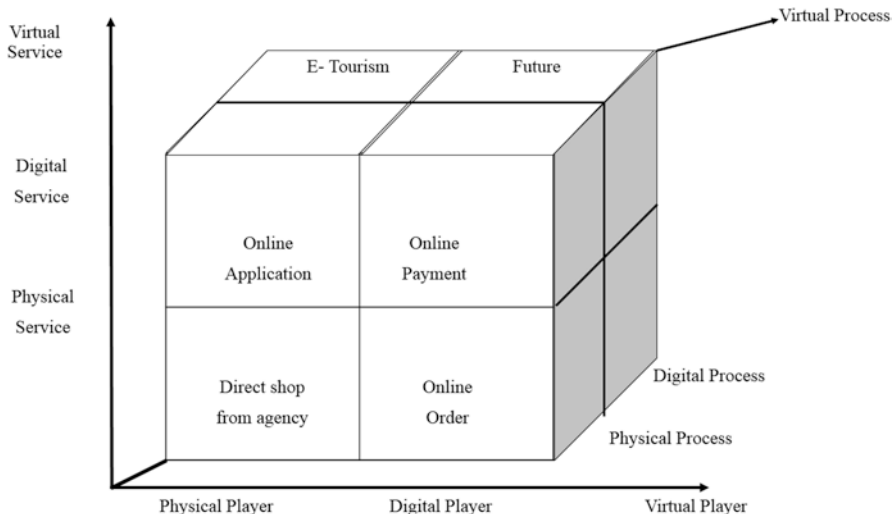
Fig. 1.2 Evolution of the eTourism industry. (Source: Adapted from Choi and Sirakaya 2005)
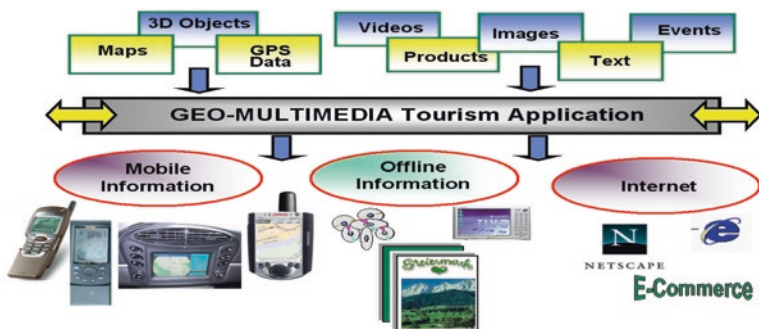
Fig. 1.3 Technology application in tourism. (Source: Adapted from Almer and Stelzl 2002)

The early innovations in ICT not only resulted in improved airlines' capacities being used but also price compatibility and in the near future, the advent of the discount airlines resulted in industry innovation and in the forced production of all segments (Fig. 1.4).

In order to simplify the tourist's choices, the factors are socio-economic commitment, cultural environment, family commitments, peer group pressure, tourists' demographical variables (i.e. disposable income, education, market offering and others). Tourist's decision-making process to visit a tourism destination depends on destination brand image and motivational factors like attractive tourism package, amenities, food and services, location, price, and promotional offer. To make a decision to visit a destination focal point is leisure time. In order to ensure tourism satisfaction, wireless technology, localization services, smart transport approaches, goal management frameworks, virtual realities and social media are essential (Ali &
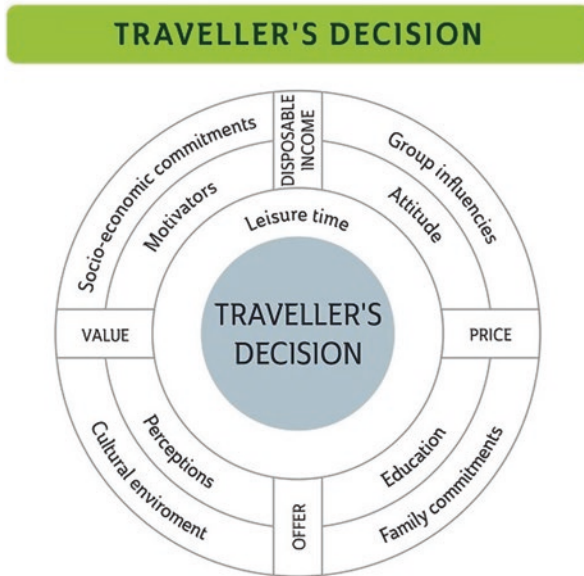
Fig. 1.4 Influencing factors of tourist's decision. (Source: Adapted from Zsarnóczky 2017)

Frew, 2014). Currently tourism market is very competitive and tourists are looking for better opportunity. However, several tourism service providers were pushed out of the market that could not cope with new challenges.

Customer satisfaction is a crucial part in the era of hospitality and tourism. Gursoy et al. (2007) state that customer satisfaction on the goods and services of tourism is a prime aspect of sustainability and future development. Parasuraman et al. (1985) indicated that quality of service can also be described as exceeding customer expectations as well as customers, irrespective of service type, defined service quality using ten different criteria known as quality determinants likewise "physical elements, reliability, communication, consistency, protection, competence, compliance, accessibility and empathy". Subsequently the numbers of these criteria were reduced to five namely "tangibles, reliability, responsiveness, assurance, and empathy" (Parasuraman et al., 1988) (Fig. 1.5).

Tourists' centric order considered three stages of consumption in which pre-consumption stage includes planning, expectation, perception, and economic status. During the time of consumption Internet connectivity, navigation, durable or non-durable products terms and condition, and ePurchase option are mostly preferred but post consumption stage share their positive experience with the people, suggested to buy the tourism products, and revisit a destination for re-experience.

Pre-consumption		Consumption		Post-consumption

◆Planning
◆Expectation-
  formation
◆Decision-
  making
◆Transactions
◆Anticipation
	→	◆Connection
		◆Navigation
		◆Short-term
		  Decision-
		  making
		◆On-site
		  transactions
			→	◆Sharing
				◆Documentation
				◆External
				  memory
				◆Re-experiencing
				◆Attachment
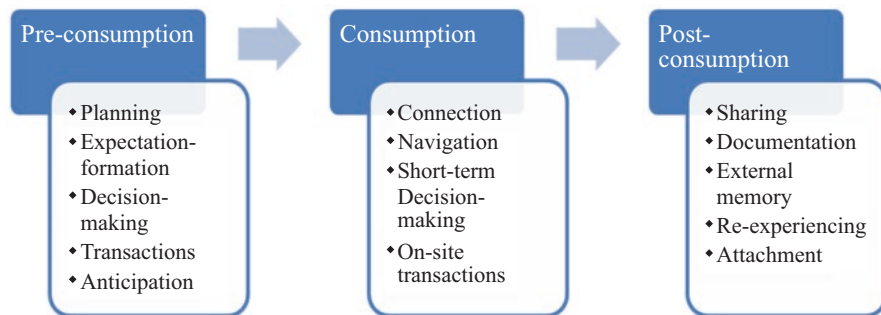
Fig. 1.5 Stages of Tourism Consumption. (Source: Adapted from Buhalis and Costa 2006)

Theoretical Framework of Technology Adoption

Several theoretical models were developed over the last 20 years to understand the actions of the implementation of IT and technological diffusion in the era of manufacturing and services area development as per global standard. To make a technology accepted conceptual framework for the tourism industry, it is essential to make a scrutiny on previous developed mostly acceptable theories of technology adoption.

In the eve of technology diffusion tourism services are mostly technology oriented, to proposed a technology based conceptual framework for tourism industry this study considered the concept of "Technology Acceptance Model (TAM)", "Theory of Reason Action (TRA)", "Theory of Planned Behavior (TPB)" and "Diffusion of Innovation (DOI)" (Davis, 1989; Fishbein & Ajzen, 1975; Rogers, 1995). In light of their limitations, some models were criticized. A significant number of models are not able to clarify predictive abilities with sufficient evidence of empirical outcome (Chaudhry et al., 2006). Consequently, this study decided to use "UTAUT" as the basic model and superior than current system (Venkatesh et al., 2003; Venkatesh & Zhang, 2010), and theory of tourism intermediaries and stakeholders for supporting (Sheldon, 97) whereas both are considering more acceptable for tourism industry.

Silva (2006) emphasizes the importance of not only providing an understanding of technological aspects, but also trying to understand the actions of the individual who is going to make use of the technology. Fishbein and Ajzen (1975) affirmed that Theory of Reasoned Action (TRA) related to the belief, subjective norms and attitude, which attempt to intentional behavior (Fig. 1.6).

TRA shows that people are rational and their behavioral pattern is more logical to evaluate pros and cons of beliefs and attitude towards act and subjective norms for behavioral intention.

Ajzen (1991) designed "Theory of Planned Behavior" (TPB) theory that attempts to predict and describe the actions of people for example in information systems, in some contexts while perceived behavioral control shows self-reliance in the access to resources and the basic behavioral likelihoods (Oliveira junior, 2006) (Fig. 1.7).
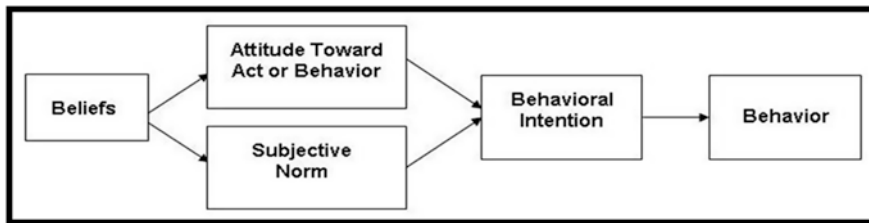
Fig. 1.6 Theory of Reasoned Action (TRA). (Source: Adapted from Fishbein and Ajzen 1975)
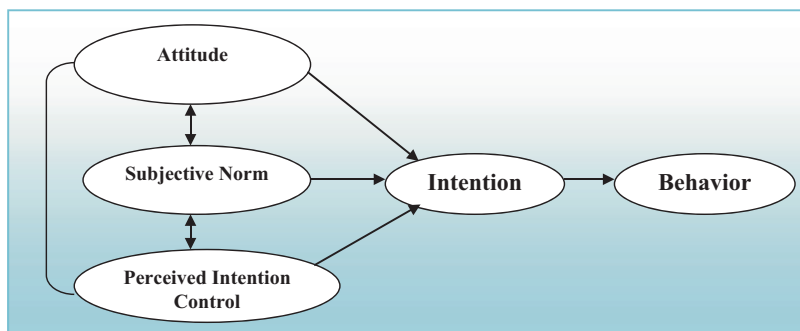
Fig. 1.7 Theory of Planned Behavior (TPB). (Source: Adapted from Ajzen 1991)

TPB Theory stated that attitude towards technology; perceived control on technology uses behavior, and users' theoretical norms influences to predicted behavior towards technology adoption. Moreover; Davis (1989) focused on "Technology Acceptance Model (TAM)" which is known as popular model for technology diffusion based on earlier stated Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975) (Fig. 1.8).

Moreover, Davis (1989) defines the two main determinants of TAM on the following way: (i) The degree of perceived utility describes that person usual belief usages of certain technology enhance his performance; (ii) Perceived use measure the degree of person confidence towards free of effort information. Furthermore; usefulness, ease of use, attitude, and relative advantages are considered critical success factor of technology acceptance nevertheless the mentioned factors are connected with "Unified Theory of Acceptance and Use of Technologies (UTAUT)". Pheeraphuttharangkoon (2015) affirmed that UTAUT notes that population dynamics, performance expectations, planned programs, peer group pressures, structure of the society, accessibility and user experience are essential factors for the intended actions and use of technology; while UTAUT is a model to describe the key factors of behavioral intention of technology (Venkatesh and Zhang, 2010) (Fig. 1.9).
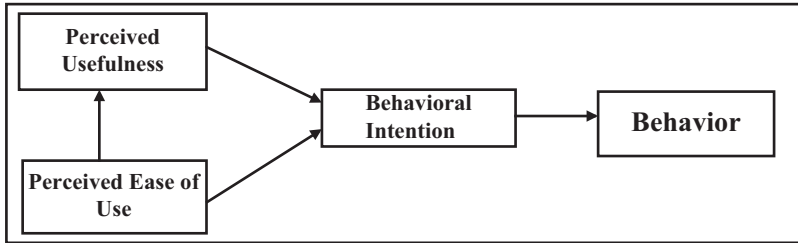
Fig. 1.8 Technology Acceptance Model (TAM). (Source: Adapted from Davis 1989)
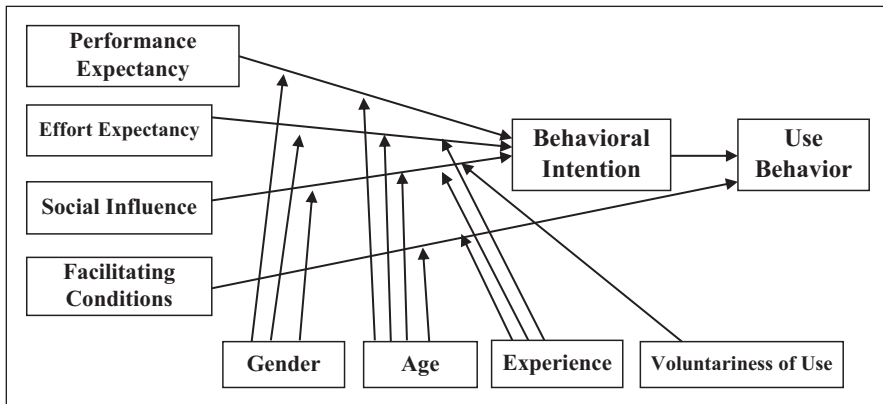
Fig. 1.9 Unified Theory of Acceptance and Use of Technology. (Source: Adapted from Pheeraphuttharangkoon 2015)

Tourism Intermediaries and Stakeholders for Tourist Satisfaction (Fig. 1.10)

To make sure the satisfaction of tourists' Sheldon (1997) developed a framework named e-tourism intermediaries and stakeholders in which market research and experts viewpoints are considered as a foundation and destination organization and government support are considered facilitating factors and available services for tourists (i.e. hotels, airlines, attraction, and entertainment facilities through travel agent, tour operator, and special channel based tourists' expectations).
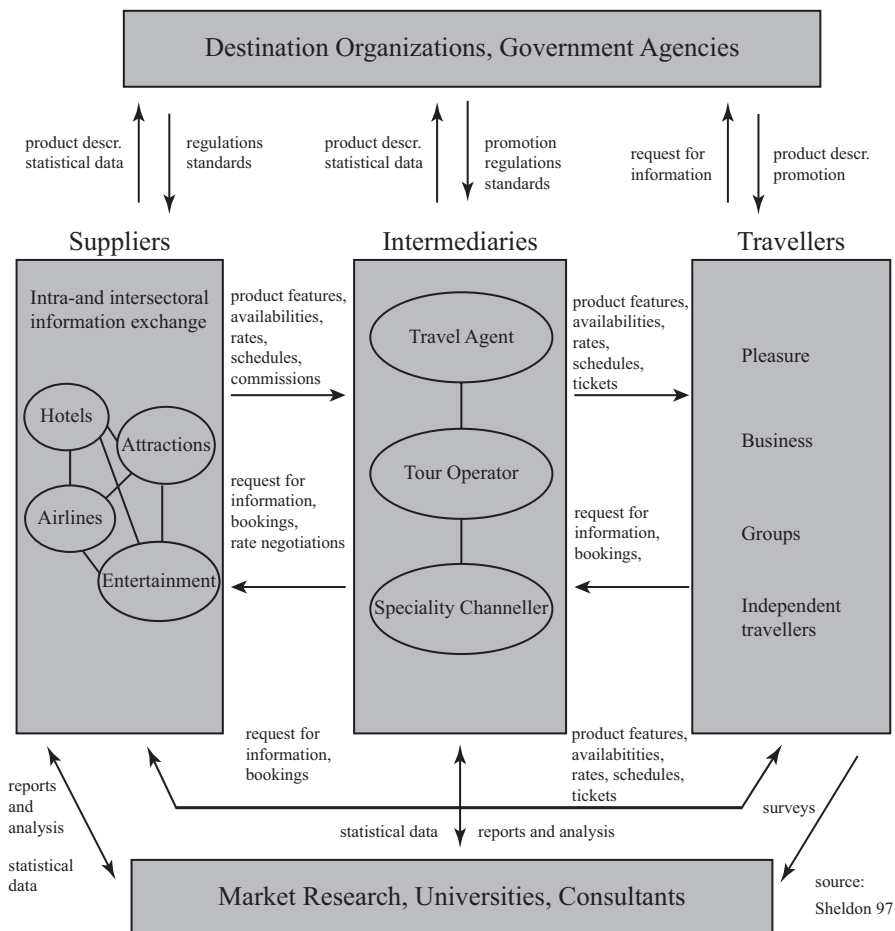
Fig. 1.10 eTourism intermediaries and stakeholders. (Source: Adapted from Sheldon 1997)

Linkage Between the Tourism, Travel, and Hospitality Industry: Tourism Supply

To provide a better service among domestic and international tourists is required a good linkage between travel, tourism and hospitality industry. Tourists are looking for good quality food, accommodation, and transportation at a reasonable price. Tourism planning and development plays a substantial role to promote tourism attraction and branding the destination. Figure 1.11 below shows the linkage components of travel, tourism, and hospitality industry.
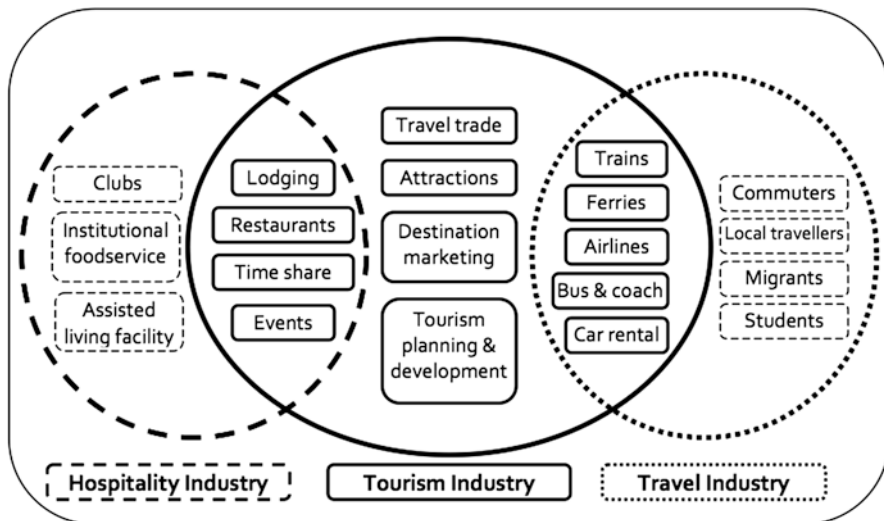
Fig. 1.11 Relationship between the tourism, hospitality and travel industry. (Source: Adapted from Pizam 2009)

Method and Materials

A mixed method has been considered as a wide range of study and make the study more comprehensive, to explore the barriers and motivational factors for eTourism adoption (Creswell, 2013). Initially this study considered literature review from previous studies based on secondary sources in which investigated technology applications in tourism and to identify the critical factors of eTourism adoption.

To generate the primary data from the respondents were asked about what are the factors affecting the adoption of eTourism in Bangladesh, at present what is the gap between demand and supply of Tourism industry in Bangladesh, suggestions related to minimize the gap between demand and supply, what are the factors affecting the value chain network for tourist satisfaction, and tourists' future expectations towards electronic tourism. Data collected from in-depth interview of 15 respondents through a semi-structured questionnaire and open ended discussions (see respondent profiles in Table 1.1 below)

The profile of the respondents shows that majority of the respondents are male (80%) and depth interview conducted from tourist (33.33%), academician (20%), tourism expert (26.7%), and service providers (20%) to identify get a clear idea regarding the factors of eTAM.

All of these in-depth interviews were conducted over the telephone, audio-recorded and had the duration between 10–15 min. These were manually transcribed for analysis. The most relevant statements generated from these interviews are presented in the next section of findings and discussions.

Table 1.1 Profile of the respondents

Variables	Respondents N = 15	Frequency (%)
Gender		
Male	12	80
Female	03	20
Occupation		
Academician	03	20
Tourism Expert	04	26.67
Tourist	05	33.33
Service providers	03	20
Education Level		
PhD	03	20
MBA/Masters	07	46.67
BBA/Honors	05	33.33
HSC	0	0
SSC	0	0
Marital Status		
Single	5	33.33
Married	10	66.67

Source: survey results

Findings and Discussions

Factors of Technology Acceptance Model and eTourism as Summarized from Reviewing the Existing Literature Studies

Previous research studies have demonstrated the impact of various technology adoption theory models on behavioral intention, intention to use, desire, and actual use of technology, as well as the factors that influence technology adoption in developed and developing countries around the world. Results are summarized in Tables 1.2 and 1.3 below.

Technology or requirements to allow the use of the technology apply to the available technological infrastructure (Van Biljon & Kotzé, 2007). The aim to use an expected model includes TAM, UTAUT, TRA, TPB and DOI theory principles and constructs. Many studies have employed a theoretical structure that incorporates models or theories (Chen & Chen, 2009; López-Nicolás et al., 2008).

Factors Relevant to Technology Acceptance and eTourism as Summarised from In-Depth Interviews

Tourism is a growing industry in Bangladesh, which has a valuable contribution to employment and economic development.

Table 1.2 Factors of technology acceptance model

Title	Theory – Model	Key factors	Source
Analyze factors affecting adoption of Smartphone	TAM	Wireless Internet, Multimedia, Post-purchase service, Technology application	Kang et al. (2011)
A study on the adoption and use of the Smartphone by older adults	TAM, UTAUT, DOI	Compatibility, Effort expectancy, Social influence	Choudrie et al. (2014)
Investigating consumers' behavioral intentions when it comes to using mobile wireless technologies	TAM	Perceived Ubiquity, Perceived Usefulness, Relevance, Behavioral intention	Kim and Garrison (2014)
Investigate the factors that affect Chinese users' intentions to use Smartphones	Theory of Reasoned Action (TRA)	Innovation, Entertainment, Attitude, Subjective norms	Ling and Yuan (2012)
To investigate the factors that influence Thai elderly people's willingness to use smartphones for e-health services	UTAUT	Perceived value, Usefulness, Effort expectancy	Boontarig et al. (2012)

Source: Constructed by the author

One of the academic respondents stated that "electronic tourism acceptance depends on social media marketing, destination attraction, ePromotion, eBranding, eTravel Package, eGuideline for ecotourism, and Virtual tourism".

Then, one of the tourism expert respondents stated that "eBanking facilities for tourism, ambient attractions, wildlife, superstructure' are significant factors for electronic tourism adoption".

The tourist respondent stated that "eShopping facilities, eTicketing, eReservation, ePayment, destination map, reliability and security, and cloud tourism are required for satisfaction".

The service provider respondent stated that "prompt service, 24/7 service, online order and payment, tourism destination map, location tracker, eBranding, ePromotion; eTourism Package; eDatabase, Tourism eBanking, Virtual tourism, and Reliability & Security of services are essential for value creation and tourists' satisfaction".

Grounded on all the technology acceptance models and qualitative data from academician, professionals, tourism experts and tourists, this study design proposed eTourism Adoption Model (eTAM).

Table 1.3 Critical factors of technology applications in eTourism

Source	Dimensions	Topic
Chiu et al. (2005)	Quality of service, Usefulness, quality, Ease purchase	eTourism
Jonathan and Tarigan (2016)	ICT, eMarketing, eTourism	eTourism effect on Economic Development
Condratov (2013)	eTourism, ICT, Internet, Marketing, Market	Concept and evolution of eTourism
Buhalis and Law (2008)	Demand dimensions, Technological Innovation	eTourism
Jain et al. (2013)	Economic, Security, Reliability, efficiency	eTourism services adoption
Berry and Seltman (2007)	eItineary, Flight status, Delay & Cancellation details	Technology application in Tourism
Buhalis (2003)	eCommerce, eMarketing, eManagement, ePlanning, eTransportation	Concept of eTourism
Conyette (2015)	Smartwatch, Phototags, Check in data	Destination Selection
Tan et al. (2017)	Effort expectancy, Social Influences	Mobile Applications in Tourism
Jain et al. (2013)	Online ticketing, Online promotion, Secure transaction, Online check in	Adoption of eToruism Services
Atembe (2015)	Accessibility, Travel history, Virtual tourism	Uses of wearable device in tourism
So et al. (2014)	Tourism Brands, Cultural and Mega events	Tourism brands and customer engagement
Deb (2020)	eVisa Processing, eTour guide, eReservation, eItenary, eTicketing, Destination Map, and Virtual Tourism	Mobile applications in eTourism
Ramos and Rodrigues (2010)	Internet, cost, and Technology	Online tourism demand
Farkhondehzadeh (2013)	Hotels, airlines, travel agencies	ICT in Tourism
Mohamed and Moradi (2011)	eMoney transfer, online payment, eTicketing, eReservation, Website, Infrastructure	Foreign tourists satisfaction towards eTourism
Pizam (2009)	Attraction, Time Share, Events, Destination Marketing, Restaurants, Lodging	Hospitality Industry and Travel industry linkage

Source: Constructed by the author

Proposed Electronic Tourism Adoption Model (eTAM)

eTourism Adoption Model (eTAM) is proposed on the basis of key findings from the relevant literature review and in-depth interviews. This model describes that to provide digital services to the customer/tourist focal point is Internet and technological innovation. eTAM focus on the tourists' demand, industry supplies, intermediaries support, paradigm of tourists, and tourist expectation (Fig. 1.12).

Fig. 1.12 Electronic Tourism Adoption Model (eTAM). (Source: Developed by the author 2020)

Due to the technological diffusion tourists demand are mostly social media marketing, eAwareness, ePlanning, eDestination branding, eGuideline for Eco-tourism, eTrade show, eArchelogical tourism promotion, eDestination Branding, eMarketing, ePromotion, eTravel Package, and Virtual tourism. On the other hand, eTourism supply site comprises of restaurants, food & beverage, eOrder and delivery, lodging, eEvents, hotel/motel/resort, time share, people and process, ambient attractions, heritage sites, sport facilities, mega event attractions, cultural events, religious events, wildlife, and superstructure provides better satisfaction of tourists. To measure the satisfaction of tourists which depends on the quality of service providers and intermediates services for example tour operator, travel agent, booking centers, online travel agencies, destination marketing organization (DMO) delivers professional and quality services to domestic and foreign tourists for positive experience of a tourism destination that assists to make a good brand image of a nation. Satisfied tourists are considering spokesperson that spread positive word of mouth for

tourism branding in locally and celebrity spokesperson assists to country branding to the international tourists.

Theoretical Justifications of eTAM

Buhalis (2003) explored that eTourism digitalises the entire value chain and process for the travel, tourism and hospitality sector, enabling businesses to improve their performance and productivity. This definition clarifies that electronic tours are the digitalization of all travel, hospitality, tourism and catering value chains, and practices. Moreover, from the tourists' perspectives 'value chain' is a critical factor in which involves cooperation and communication with channel partners, who can be vendors, mediators, third party service providers, and customers. In essence, supply chain management combines the management of supply and demand inside and over the industries. The effective way of relocate and redistributed the risk, and provides essential services as per expectation creates value (Ricketts et al., 2014).

Due to digitalization, tourists' expectation is increasing day by day that is why it is critical to get depicts about the preferences and choices of tourists through tourism database (i.e. traveler profile, traveler location, traveler latent demand) is significant aspect. On the other hand; eBranding is an essential part for the adoption of eTourism whereas eBranding enhance lively online communities, user-friendly site, ePromotion, eMarketing, mobile marketing through social media. Deb and Roy (2015) mentioned that eTourism facilities, attractive tourism site, eService, usefulness; and eSecurity are significant for eTourism adoption in Bangladesh, which represents most of the variables are similar with this study. Today eTourism value chain one of the key focus points is virtual tourism which helps to promote tourism through destination promo, video presentation of a tourism place, virtual reality, and spoke persons who provides positive message to the people to visit a tourism destination for recreation.

Implications of eTAM in the Tourism Industry

Over the decades, tourism has continued to expand and become world rapidest growing economic sectors with deepening diversification. Digitalization and use of new technologies have changed our outlook and perception of the tourism services. Modern tourism has strong links with a rising number of new destinations and technology application in tourism for socio-economic growth of a nation.

In Bangladesh the users of Internet are increasing day by day and most of them are smartphone users while smartphone provides computer enabled all the facilities and information to the tourist. Therefore, prompt service, 24 h in a week any time service, online order and payment, tourism destination map, location tracker, reliability and security have become a crucial factor to the tourists so that tourism

service providers offers better quality food and beverage with home delivery services, 5*, 4*, 3* chain hotels, leisure hotels, and city hotels providing better accommodation for domestic and international tourists with room service facilities at a reasonable cost. Socio-economic condition of Bangladesh is increasing as a surprising rate so that tourist's eServices demand boost in social media marketing, eTourism package, ePromotion, eBranding, and virtual tourism that is why Bangladesh Tourism Board (BTB) developed tourism destination promotional videos with foreign celebrities for country branding. Bangladesh Parjatan Corporation (BPC) provides accommodation, food & beverage, and even in Dhaka restaurants business included Robot to serve food and other services to the customer while eReservation, eMarketing, eAwareness through social will be a best option to attract more international tourists. In Bangladesh travel and tourism mediators for example; tour operators, travel agencies, DMO, booking centers have to use eService's in the area of shopping, cloud tourism, Travel Package, time share, and even in cultural events to generate competitive advantage and tourists' satisfaction.

eTourism is a modern way to think, plan and observe the holidays. Smartphone, laptops and tablets are constantly being used to book flights and hotels. They prefer to also chat about and submit their stay photos and videos. During eTourism, travelers share their views and experience before they go on a ride, during the journey and after the social networks holidays is related to the promotion of eTourism.

Go global and think Big is a common aspect in the tourism industry. Both concepts play a boosting role for tourism in globally even also in Bangladesh that is why each tourism organization thinks about tourism revitalization through technology value chain model. Most of tourism service providers change their business notion and turn into digital tourism (eTourism) which is environmental friendly, mega online database about the choice and preferences of tourists, ePayment facilities throughout debit card, credit card, and priority pass etc. provided by banks. All the services of the values chain are interlinked between tourists' expectation and satisfaction. Government tourism supporting agencies are also encouraging digital tourism for green environment and sustainable development.

Amid the use of eTAM model, the stakeholders of tourism industry will get a clear depicts on the challenges and opportunities of eTourism adoption in Bangladesh but this model can be applicable in any country eService development in tourism sector. Government should have to develop technology-based infrastructure, and make a master plan for tourism development besides these stakeholders will have to take the opportunity to attract domestic and international tourists to revive the business at a profit with tourist satisfaction.

Conclusion and Further Direction of Study

eTourism plays a crucial part in developed and developing countries' socio-economic growth. It offers the chance to diversify the economy and plays a major role in rising living standards and lifting people beyond the poverty line. Technology

adoption in tourism business has both challenges and opportunities in the emerging economy though the competition of tourism business increases dramatically due the expectations of tourists.

This study developed electronic tourism adoption model (eTAM), which processes the theories of technology acceptance, based on TAM, TPB, TRA, UTAUT, eTourism intermediaries and stakeholders model for customer behavior towards technology applications in tourism. Proposed model provides factors of value chain that is closely connected with eTourism adoption model. This model provides appropriate information on eTourism key factors for adoption, which can help the government and concern tourism development agencies for policy making, demand assessment, customised services, eco-tourism guidelines, a master plan for sustainable tourism.

Social media are becoming increasingly important for the user to schedule and enjoy traveling online and mobile. Visitors are linked socially not only before and after but also more and more by mobile devices. In response, the tourism industry should make much more extensive use of social media. International IPK (2012) stated that social media are fetching more significant to make a plan of customer and enjoy the travel with mobile technology and broadband facilities.

Today social media (i.e. Facebook, Instagram, LinkedIn, WhatsApp, and others) are became a crucial platform for promoting and branding tourism destinations to the domestic and international tourists. Tourists are now combating the latest digital technologies that can enhance tourists' customised services and online meaningful interactions-the Web 3.0. Moreover, next generation will be more focus on the reliability and privacy of eTourism services.

This study focus on the technological applications in tourism sector with a propose tourism acceptance model adoption. Further study is recommended to measure the economic impact of eTAM in Bangladesh and a comparative study can be conducted in between South Asian countries. It is also recommended that a profounder study can be carried out to discover tourists' attitudes towards technology adoption intention in tourism industry.

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Chapter 2
The Diffusion of Technologies: Concept Analysis and Relevant Examples in the Tourism and Hospitality Industry of Bangladesh

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Abstract Research studies in tourism marketing and technology application suggest that the Diffusion of Innovation Theory of Rogers (Diffusion of innovations. The Free Press, New York, 1962) can be one of the most relevant and valid concept. While focusing on the basic features of this theory, this study analyses its stages. This study offers a particular reference to Bangladesh to study technology adoption in the tourism and hospitality. The study concentrates on this theory for understanding its features and critically outlines its validity for the tourism and hospitality industry of Bangladesh. The study identifies the application of Augmented Reality (AR) as an element of eMarketing in the tourism and tourism industry in Bangladesh stays as the Early Majority Stage; while, Network Structure as the most influential component in this context.

Keywords Innovation · The diffusion of innovation · Augmented reality · Bangladesh · Adoption · Narrative

Introduction

The adoption of useful and innovative technologies is important in any industry including the tourism and hospitality. Effective selection and adoption of technology can be ensuring the access of services and products to tourists. Also, such

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selection and adoption can help tourism and hospitality enterprises to achieve targets that can turn to more realistic and achievable. However, this is important to select the most suitable and innovative technologies for marketing needs. This is very typical that technologies mainly support and give rise to innovations. In terms of marketing, diffusions are adapted mostly in digital forms and related to digital marketing. A theoretical investigation and some narratives are offered to explore Augmented Reality (AR) technology adoption in the tourism industry of Bangladesh. A technological shift from traditional to online marketing platform is viewed as an ultimate outcome of technological advancements of recent years. An innovative technology an AR creates scopes for tourism and tourism business expansion. The study thoroughly outlines the features of AR as a useful and valid technology for the tourism and tourism industry on the ground of the Diffusion of Innovation Theory of Rogers (1962). This contents of this research are based on gaps in the literature when aspiring to develop the application of AR in tourism based on generic criticisms and analytical explanations made in the earlier literature studies. In addition, logical consistencies in arguments are ensured as individual consumers' reactions to a specific innovative technology as AR deserves attention. Hence, this research is anticipated to contribute to filling existing gaps in the current literature.

What is an Innovation?

Innovation in organization and service delivery is seen as a new generation of habits, routines, and ways of operating aimed at enhancing health outcomes, administrative performance, cost-effectiveness, or the experience of users (Greenhalgh et al. 2004). The distribution, diffusion, sustainability, and implementation of these technologies are all linked by concerted and scheduled actions. These are categorized in six ways: the actual innovation, the process of adoption/assimilation, influence and communication, the inner perspectives, the outer perspectives, and the process of implementation.

According to Meyer, Johnson and Ethington (1997), Dirksen, Ament and Go (1996), Rogers (1995), and Marshall (1990), unambiguous and clear innovations for both cost-effectiveness and effectiveness are easier for adopting and implementing within an organization that is termed as "relative advantage". Still, the extensive adoption and implementation of this theory can hardly be guaranteed (Denis et al., 2002; Grimshaw et al., 2004; Fitzgerald et al., 2002). Ferlie, Gabbay, Fitzgerald, Locock and Dopson (2001) argue that the potential adopters of this theory may analyze, discuss, reframe and contest their perceived notion of a specific innovation.

At the time of readily adoption of an innovation, compatibility becomes crucial. Researchers refer to the potential adopters' norms, values and perceived needs through compatibility (Denis et al., 2002; Foy et al., 2002; Ferlie et al., 2001; Rogers, 1995). For a good assimilation, organizational continuity with technologies becomes critical (Denis et al., 2002; Ferlie et al., 2001; Fennell & Warnecke, 1988).

Simplicity in innovation is relatively easier to adopt by an organization. However, in case the key management and players perceive the innovation process as complex, this can lead to complexities for put in position (Denis et al., 2002; Rogers, 1995; Grilli & Lomas, 1994; Meyer & Goes, 1988; Marshall, 1990; Meyer et al., 1997).

These obstacles or drawbacks or can be levied by applied experience supported by relevant demonstration. An innovation can be subcategorized and incrementally adopted and can be straightforwardly accepted because of relatively fewer response barriers that are required to overcome (Plsek, 2003; Rogers, 1995).

Trial and error coupled with the new innovations are important for its adoption and implementation (Plsek, 2003; Yetton et al., 1999; Grilli & Lomas, 1994; Rogers, 1995). In such situation, the consumers can become able for experimenting on limited basis that is known as "trialability space" (Plsek, 2003; Øvretveit et al., 2002; Rogers, 1995).

If an innovation's benefits becomes visible to meet particular demands of the consumers, there are more probability for its adoption, implementation and assimilation (Denis et al., 2002; Grilli & Lomas, 1994; Meyer & Goes, 1988). A tangible aspect of newly considered innovations is a huge asset in encouraging the audience to buy into the overall process (Øvretveit et al., 2002).

The reinvention capacity of an innovation is important, where potential adopters can either adopt, modify or otherwise refine for matching to their specific demands for making the adoption practice smoother (Meyer et al., 1997; Rogers, 1995). Standard attributes of innovation alone are not sufficient in explaining the adoption and assimilation of an organization (Rogers, 1995).

The successful adoption and practice of an innovation can be badly affected by the risk associated to it. The benefits and risks of an innovation cannot be always evenly distributed in any organization (Meyer et al., 1997; Meyer & Goes, 1988). Thus, the acceptable balance between benefits and risks of an innovation needs to be ensured for its successful assimilation (Denis et al., 2002; Ferlie et al., 2001).

The Diffusion of Innovation

With an aim to understand the diffusion of innovative technology as AR, this research considers the work of Kozinets, 2015; Machi & McEvoy, 2012; Hart, 2005; Fink, 2010; Pan, 2008. In the process of adoption, there are some stages where the strengths and weaknesses are generally analyzed for these successive stages. Post hoc empirical research that characterized and clarified diffusion processes gradually replaced early theorizing from the turn of the twentieth century. Diffusion theorists began to apply what they had discovered about naturalistic diffusion in studies of process interventions to influence the dissemination of technologies in the 1950s (Dearing, 2009). The Diffusion of Innovation Theory in tourism by Rogers (1962) is important because marketing on electronic platforms can require both expertise and capacities of technology and marketing. The study outlines that, businesses

place this theory in practice in times when they launch, adapt, or even introduce a product or service in a new market or a new market environment.

Assimilation by the system in the process of technology diffusion is important. A good number of research studies on the innovation diffusion highlighted product-based innovations, the simplicity that resulted in the individual as the adoption unit. This also led diffusion to occur by the means of simple imitation and identified such components as: Network Structure, Homophily, Opinion Leaders, Champions, and Boundary Spanners (Rogers, 1995). Also, five identified stages are innovations, early adopters, early majority, late majority, and laggards according to the Diffusion of Innovation Theory of Rogers (1962).

Using a proposed innovation dissemination program can be more effective if organizers of the program can: first, consider the potential adopters' full account of demands and perspectives followed by the specific attention of their costs and benefits; second, can tailor diverse strategies tailored for different demographic, cultural and structural characteristics of diverse subgroups; third, can apply an appropriate styled message, metaphors, imagery, and so on; fourth, can both identify and apply the specific channels of communication; and finally, can incorporate rigorous monitoring evaluation and of defined milestones and goals (Rogers, 1995).

The functions of eMediaries with their roles for diffusing innovation are crucial. In a technology-induced business world, the tourism industry is largely influenced by innovations. The outcome of innovative technologies as AR appears quite commonly for use by the consumers. Technological innovation is adopted by practitioners in the tourism industry. Technological innovations are diffused by eMediaries through their marketing strategies mainly in digitalized formats. This form of marketing creates numerous platforms of communications and thus offers a more beneficial digital marketing network. Innovations are thus believed to be adopted more intensively than ever before in the recent travel market context. This is granted that technological innovations and eMediaries have closer proximities, in terms of their interrelationships and offers. In the present tourism world, technologies are diffused through certain platforms, and out of these, AR has better acceptability. This technology arguably renders potentials to be used for tourism marketing purposes. There are also contexts where technologies can act and support the entire tourism business industry through capacity enhancements. These are also quite typical that innovative technology adoptions are explained through the role analysis of eMediaries. These are normally viewed as having better capacities and strengths to initiate and perform in more manageable ways. Marketers and business persons emphasize the relevancy and essentiality of technology use in tourism but, the patterns and expected ways are still subjects of further exploration.

Setting the right target of customer bases, marketers have to be well informed and should have detailed information about their potential and targeted customers. This is crucial to understand the core of target customers with their non-defined characteristics. Information on almost all areas of targeted customer bases is required to allow the business to stand on a solid and apparent platform that is meant to be more useful and rewarding. This is also important for the roles and possible contributions of related factors with the data collection and their interpretation. For

this purpose, both online and offline media platforms can offer responsible features. These are simply the demands of the on-growing demand of data and information in a more technology intervened business world. Data on targeted customers should cover the typical demographics and these are more or less considered as traditional. To follow a logical sequence is important and this is thus believed as more result-oriented or focused. The identification of the right data or information, selecting their typologies, ensuring maximum quality, and thus turning them as valid in the volatile or complex market situation is undoubtedly essential. Internet protocol-based information is the most sought after item of recent times and these can be considered as reliable in any type of market setting. This is important to learn and know the location of solid customers who can push the business forward. This is why the marketers are required to understand and outline features of such identified customers at the earliest possible time of the business starting time.

The use of valid and most updated information or data is also important for the business to exist and flourish. The notion that the Internet has no geographical boundaries, that is, that this technology is universal and open to the interaction of diverse viewpoints and knowledge, is widely held. This is beneficial for marketers where they can easily locate their targeted customer bases. The use of the Internet by users can turn them into potential customers through the effective involvement of marketers and business persons. Even though the platforms of Internet use are changed within numerous gadgets like laptops, mobile phones, servers, and so on, there is a constant development of technologies that allow the spotting of targeted customers in different market environments and geographical locations.

Is Augmented Reality the Diffusion of Innovation?

On the ground of the Diffusion of Innovation Theory (Rogers, 1962), an innovative technology as AR can be viewed as a technological innovation diffused in many societies. To define, "augmented reality 'augments' the viewer's surroundings with new digital imagery and information… To that extent, AR may or may not mean much to the average consumer - a cool image is great, but it doesn't create a connection. Thus, augmented reality in and of itself usually isn't the goal of any marketing campaign; the goal is to use AR in such a way that it creates an interactive experience, engaging the customer through a rich and rewarding experience" (Vong, 2012: p.1).

Buchholz (2014) also defines AR as the computer-assisted augmenting of experience by means of additional interactive knowledge levels in real-time is known as Augmented Reality, or AR. The difference between AR and Virtual Reality (VR) is that in Virtual Reality, the user is fully submerged in a virtual environment that is unrelated to reality.

Few of the features and capacities of AR that have innovativeness are: innovation, optimism, novelty, personal innovativeness, uniqueness, innovativeness, difference, a new virtual sphere, a new media platform or a new sphere of opportunities).

Some other user-friendliness features of AR are: functional benefits, ease of use, the visual factor of AR, brand attitudes, content, information quality, system quality, recommendations, user costs, individual abilities, knowledge, involvement, redefined mobile technology experience, local culture, improved mobile usability, revolutionized experience, better personal experience, interactivity advantage, social media compatibility, interactivity capacities with viral loop, virality, interface technique, personalization, increased content, visualized catalogue, enriched usability etc.

Some features of AR that can be labelled as availability issues are: integration failure, security risks, insecurity). Some technological issues are: discomfort, situational factor risk, facilitating conditions, technological similarity, uncertainty about fully taking off, depth perception's disturbed binocular vision, confusion with animation, cartoonish image, the limited scope of image recognition, problematic object recognition, glitch imaging, disturbed compatibility with Smartphones etc.

Customer perception that affects AR adoption by tourists in this regard is the customer views about AR. AR has a playfulness to be adopted by tourists. The key reason to adopt AR is immediate amazement (Johnson, 2015). On the other side, AR as technology is user-friendly, encouraging adoption by tourists. Personalization (Smith, 2010) is a prime positive factor for AR adoption by tourists. Thus, customer perception is considered as the basic reason for this research to continue rigid statistical analysis.

On the basis of critical discussions of AR specific literature studies, theoretical factors of AR adoption and innovative technology are considered. Classified reasons for AR adoption by tourists are presented. The first part of the third objective of this research, to determine positive factors for AR adoption by tourists, is discussed. Selected factors generated from AR specific literature to serve this objective are defined as positive as they most likely to motivate tourists to adopt AR. These positive factors for AR adoption by tourists are generated from literature and are considered while developing the conceptual framework of this research. This part aligns with the third objective of this research: to determine negative factors discouraging the adoption of AR by tourists. These are also generated from AR specific literature. They are defined as negative because they influence tourists not to adopt AR. These are assigned to relevant domains. Many items thus are not included having different focus as: new marketing campaign (Larkin, 2011) is more oriented to marketing and business than tourist adoption; this factor is not considered as it is beyond the focus of this research. AR suffers from a lack of brand ownership. This negative feature is more focused on marketing and business than on tourism and remains beyond the scope of this research. Thus, this feature of AR is not considered.

Hassan and Rahimi (2016) viewed AR as an innovation for digital tourism marketing. Hassan et al. (2017) outlined the adoption of AR by tourism product and service consumers and found that AR is being adopted successfully. In a similar line of research, Hassan (2018), Shabani and Hassan (2017), and Rahimi et al. (2017) proposed that AR is adopted for the formation of a destination image. AR is also

adopted as an emerging tool in education (Hassan & Jung, 2016) and for better visitor experience generation (Hassan & Ramkissoon, 2017).

Summing up the discussions made in the available literature studies on AR adoption as made in the earlier section. These reasons are generated from the most relevant literature studies and theories. Researchers argue that the five selected positive reasons for the adoption of AR by tourists are: innovativeness, usability, real-time experience, tourist support, special features, and computing device compatibility. On the other side, three negative reasons for not accepting AR by tourists are: technological issues, availability issues, and perceived risk discouraging the adoption of AR. Reasons generated from relevant AR adoption research studies in tourism, positive factors of AR adoption and negative factors discouraging the adoption of AR by tourists have both similarities and differences among them.

The Bangladesh Context

What Is Innovation in Bangladesh?

The application of different innovative technological tools such as mobile or smartphone-based software applications, user-friendly websites and web solutions, chatbot services, VR etc. in the tourism and hospitality industry of Bangladesh is noticed in a very limited scale. Thus, the critical aspect needs to be defined as innovation as seen as early by the tourism and tourism industry in Bangladesh while, Network Structure as the most influential component in this context. The activities of eMediaries and young entrepreneurs in the tourism and hospitality industry of Bangladesh are important as they are introducing and applying newer forms of technologies in this industry. For instance, in 2017, for the first time in Bangladesh, an entrepreneur has introduced robot technology in delivering food services to the guests (The Daily Star, 2017; Dhaka Tribune, 2017) as well as many travel agencies and tour companies from the public and private bodies started using technological innovations such as the internet, websites, software applications, and social media platforms to promote, offer, and sell their package services and products to the tourists or customers (Howlader, 2018). Besides, the authority of Fantasy Kingdom, one of Bangladesh's most popular theme parks, has applied VR technology for enhancing visitors' experience (Daily Sun, 2019). The government tourism organizations are also initiating innovative technology applications to facilitate hotel booking, ticketing, complaint handling, and to give feedback to the tourists (Howlader, 2018). However, eMediaries, entrepreneurs, and parties involved in the tourism and hospitality industries support research and partnerships, and their positions in the process of making new technologies accessible in Bangladesh are critical.

The Diffusion of Innovation in Bangladesh

The discussion of the theory of "Diffusion of Innovation" is relevant here. This study checked the validity of this theory within the specific areas of innovation as AR. The "Diffusion of Innovation" theory as outlined by Rogers (1962) genuinely supports the adoption and explanation of technological advancements. This also supports that technological innovations are required to be adopted and diffused over time in the diverse social scenarios and diverse patterns. However, the background when this theory was offered shows dissimilarities than today, and the entire social variables have also been altered. Thus this is necessary to study, the "Diffusion of Innovation" theory to outline and analyze the present tourism market structure and to recommend some implications for future marketers. In this theory, most of the key research areas are given considerable importance while discussing and analyzing. On the basis of this theory, this research guides towards an acceptable conclusion that innovative technologies are adopted in Bangladesh.

Is Augmented Reality the Diffusion of Innovation in Bangladesh?

AR is an innovative technology that can bring changes in specific industries including tourism. The usage and effectiveness of AR technology application in the tourism industry throughout the world are well appreciated (Chung et al., 2015; Dadwal & Hassan, 2015; Jung & Han, 2014; Han et al., 2014; Nayyar et al., 2018; Kounavis et al., 2012; Yovcheva et al., 2012) and this technology plays substantial role when applied as a tool for tourism and hospitality eMarketing (Shabani et al., 2018; Shabani & Hassan, 2018; Ilhan & Celtek, 2016). From the perspective of Bangladesh, this technology is essentially an innovation and this has been successfully diffusing in the tourism industry. This industry is expanding and getting more attention from the parties involved. Thus, there are scopes for applying different technologies that can be termed as innovations on the basis of their features and usability. Hassan and Ramkissoon (2017) found an enormous possibility of AR technology application in the tourism industry particularly in the museum segment of Bangladesh requiring technological infrastructure and skilled human resources. But many theoretical discussions exist in the literature which suggests that AR has some technological difficulties that can become reasons for not adopting this technology. The adoption of AR for meeting consumers' increasing demand is important when AR is reliant on mobile technology applications. For a couple of years, in Bangladesh, the advancement of mobile technology usage is significant. Recently, the country has witnessed a boom in mobile internet usage as well (The Financial Express, 2020). So it is evident that mobile technology users are also on the rise. In tourism mobile technology applications cannot be conventional and static rather in many cases, there is a very rapid implementation of innovation in using mobile technology. Moreover, the

applications of innovative technologies in tourism and hospitality industry promote achieving sustainable development goals. AR technology can be revolutionary in such cases and manage to bring some key advancement. Reasons drawn from AR specific literature studies reviews are brought under several reasons based on their features. There are some basic reasons that influence tourists positively to adopt AR as well as there some negative reasons that act as barriers to adopt AR by the tourists. Considerable number of research studies are conducted covering the application of AR in many selected areas of the tourism and hospitality industry.

Conclusion

Bangladesh as a cosmopolitan country attracts visitors from all over the world. The Diffusion of Innovation theory supports businesses in understanding the steps and processes through which a buyer gets engaged and supports a newer version of technology or products as innovation over a certain period of time. This principle resembles the process of adapting a new product or service, which is accompanied by five groups and types of customers, as well as the trends in which to participate in any business involving those people. This determines that the use of AR as a tool of eMarketing covers the component of Network Structure. Apart from the food-related business industry focus, entertainment and gaming industries in Bangladesh has also seen the introduction and expansion of an updated technology as AR. This technology in its real sense has enriched the tourism industry in Bangladesh.

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Chapter 3
Application of Technology for Tourism Products and Services in Bangladesh

Mallika Roy and A H M Salimullah

Abstract This paper discusses the related topic of tourism technology value assessment. Technology is now one of the evidential drivers of tourism growth in a rapidly evolving, globalized, and advanced world. The paper looks at a variety of technological products and services used in the tourism industry. Entertainment falls within the umbrella of relaxation, and it incorporates the activities and events we do to enjoy our time. Tourism makes it one step further-it is heading out to evenly accommodate entertainment and relaxation. The emergence of technological application has transformed the conventional use of the Internet. This new point of view has prompted a slew of studies on its effect on the tourism industry. The Internet is the most important tourism technology. Mobile phones, cable television, fixed telephones, and standard personal computers and laptops can all be used to access it. Information is readily throughout the day and night, and the cost transparency that results allows customers to make more informed decisions. Tourism is still a thriving industry in Bangladesh, but it has some difficulties relating to the data available. As a result, two approaches were needed for this study's methodology: desk approaches that included meta-analysis; and approaches of in-depth interview of selected markets. The study relied on primary data. Most of the previous topic has been condensed into a succinct overview of some important marketing points for applying to promote potential tourism technologies in this report.

Keywords Technology · ICT · Telecommunications · One stop service

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Introduction

Tourism is a high-value income-generating enterprise in today's world. It holds inordinate economic potential for the developing countries. Bangladesh is a developing country with a vast potential to grow tourism industry. The country has heroic history, abundant natural beauties, and archaeological resources that are available for tourists to experience.

Technology has reliably encouraged us in our step by step lives. It has changed us in each field. Advancement in transport sector has empowered us to arrive at those parts which are perilous to explore. Different things like mobile, PC and more have changed the manner in which we sell, purchase, work and basically change each piece of our lives. It has ended up being a right hand for our lives. Technological devices' acceptance and usage in the tourism industry appear to be showing an increased interest. Its effect on the tourism is massive. Technologies have been changing the tourism industry all around the world. The technology driven redesigning has steadily created another change in outlook, adjusting the business structure and building up an entire scope of chances and problems. Technologies enable consumers to recognize, redo and buy the tourism industry products and services while inaugurating a globalized tourism sector by giving instruments to production, overseeing and distribution around the world. Technology is becoming a basic part of competitiveness in tourism industry.

Tourism technology advancements can help local people earn more money and live better lives. It has the potential to resuscitate local customs, culture, and especially traditional crafts. It can boost the rural economy's growth by generating demand for agricultural goods and funding infrastructure projects; it can also inject capital into rural areas. As a result, technical devices that can help distribute tourism knowledge should be available for effective tourism marketing for the good of all sharers. Until now, the idea of technological innovation in Bangladesh has not been adequately reflected in the country's existing tourism development programs. A few of the tourism experts believe that instead of trying to accommodate many tourists beyond its ability, Bangladesh should focus on ecotourism growth. In our paper, we attempted to assess the state of technology in selected regions based on the expectations and views of tourists and tourism employees, and we proposed a business design to boost the tourism industry in Bangladesh.

This paper looks at the field of tourism and the different information technology that can be used to improve the industry's infrastructure. The results of this study will assist policymakers in identifying a mix of technological solutions that can assist them in developing tourist-friendly policies and proper resource use policies for optimum return.

The main goal of this research is to focus on issues related to the problem and potential of technology in the Bangladeshi tourism industry. However, the basic objectives of this study are as follows: first, to understand the current scenario of technology in tourism products and services in Bangladesh; second, to understand the existing problems and prospects associated with technology growth in

Bangladesh; and third, to recommend a technology in tourism industry paradigm in Bangladesh.

Literature Review

Despite the fact that usually abused, technological advancement and imagination, mean and speak to various things since innovativeness covers new items and new administrations, creation of novel thoughts, new cycles, new brands, new strategies, new methodologies and developments, while innovation covers the utilization of new and inventive thoughts just as implication of discoveries (Decelle, 2004; Erdem et al., 2011; Tan, 2004).

According to evidence, information and communication technologies (ICT) improve accessibility and enjoyment for both residents and visitors by providing digital services and interconnectivity (Buhalis & Amaranggana, 2014). Another viewpoint is that we live in a "smart environment" in which the landscape is constantly evolving and becoming more welcoming as a result of rapid advancements in ICTs (United Nations World Tourism Organization, 2011). Without a doubt, the use of ICTs provides simpler solutions that help to save time and money while also triggering new tourist reactions (Tourism Embassy, 2013; United Nations World Tourism Organization, 2011). In recent years, wireless and mobile technology have had a significant impact on tourist activity. These technologies allow tourists to engage in mobile social web activities, thereby establishing a new way of life (Fesenmaier et al., 2000; Ye & Tussyadiah, 2011; Lee & Mills, 2010; Luz et al., 2010; Tourism Review, 2014; Tussyadiah & Fesenmaier, 2008; Wang et al., 2012) and facilitating the development of meaningful personalized experiences (Mihajlovic, 2014; Neuhofer et al., 2015).

Since the tourism industry is an information-intensive industry, a focal reservation framework was frequently used to store and recover data and direct exchanges (Buhalis, 2000), in this way making a focal client information base. Booking in the tourism industry administrations relied upon travel planners, who intervened the connection between the tourism industry firms and clients (Buhalis, 1996). Nonetheless, the pervasiveness of personal computer (PC) frameworks and the development of the web changed and altered the manner, in which the tourism industry exchanges are directed (Buhalis & Deimezi, 2004). The Internet has become a place for shoppers to look for the tourism industry related data, buy the tourism industry products and services, and acquire others' feelings.

Uncertainty about the wellbeing of online tourism bookings and exchanges impacted on early streams of examination of security (Kim et al., 2006), protection (Lee & Cranage, 2011) and trust (Wu & Chang, 2005). Especially, security was viewed as the main thought for internet booking (Kim et al., 2006; Ryan & Rao, 2008). Increments in buyers' adoption and utilization of web based platforms in the tourism industry and friendliness administrations made site quality concerns, in this manner affecting exploration on web architecture quality (Ku & Chen, 2015).

Simplicity of route and data quality became significant contemplations for drawing in and holding clients (Wong & Law, 2005; Kaplanidou & Vogt, 2006), as user-friendly sites upgraded data search and helped sightseers show up at speedy choices (Ku & Chen, 2015). Then, Destination Marketing Organizations (DMO) understood that the web offered bountiful open doors for their activities. Therefore, sites were intended to reflect objective ascribes, accordingly impacting the apparent picture of the objective and making a virtual encounter for the buyer (Sparks & Pan, 2009). Genuine travel and the aim to travel were affected by touring, culture and legacy action; thus, customers were pulled in to objective sites that mirrored these qualities (Murphy et al., 2011).

The aim of this chapter's investigation is to concentrate on technology-assisted tourism strategies in Bangladesh. First, we looked at the current tourism technology and its trends. Second, we described the tourism technology customer and their buying behavior in terms of motivation-based tourism. Finally, we looked at the tourism technology's potential in Bangladesh from a global perspective. Finally, we offered suggestions for promoting potential technical applications more effectively and efficiently with limited resources.

The Role of Technology in Tourism

The hugeness of technology in tourism has brought all the far spots close. The speed of time has extended its rules, one road trip is basic nowadays, and the experience is agreeable and quick. Things that should be conceivable in an hour, they would now have the option to be done in a second or even in a second, to recognize themselves for innovation. Spots that cannot contact people consistently; now, one can be reached in a moment. Innovation gives us apparatuses that can make a striking outing. Today, the advancement has advanced in gigantic limits and jumps. We cannot imagine the world without innovative progressions, for instance, LEDs, Computer and machines, and so forth. Despite the facilities, there are a couple of burdens and preferences of the procedure. Above all, innovation plays a significant occupation in the overall population since it makes life less tedious and much simpler to live. Technology can make simple courses at work. People do not have to buckle down as of now, individuals use advanced technology to make arrangements for their excursion, which makes it dynamically worthwhile and basic. They can ask about the spots on their own movement, search for the best hotels and charges and hold a spot from their mobile or PC.

Tourism, Hospitality and Technology

E-Tourism Demand and Technology-Driven Revolution

The Internet has capacities to bring flexibility in the processes of service delivery and consumer choices. At present, customers also become more discerning and sophisticated. One of the main reasons is that they experience high levels of service and because the standard of living has grown considerably. Thus, tourists have become more demanding, demanding high-quality products and placing a high value on their money, as well as, probably more crucially, their time. This indicates that people are pressed for time. After being introduced to a variety of tourist products and places, experienced, smart, and demanding visitors rely significantly on electronic media to get knowledge about destinations and rapidly communicate their wants and wishes to suppliers (Bethapudi, 2013).

E-Tourism Impacts on Marketing Mix

The Internet and the World Wide Web (WWWW) have changed the way tourism is promoted and communicated. ICTs will help you save money on commissions. Expedia is using eBooks to break into the market and acquire a large share, resulting in a re-intermediation of the distribution system. E-Airlines are a form of online airline. Travel agencies had to manually locate the best routes and fares for their customers in a manual, then call for availability, reservation, and confirmation before manually issuing a ticket, and American Airlines launched its SABRE Computerized Reservations Systems (CRS) in 1962 to replace manual reservations on display boards where passengers were identified. In the worldwide tourist industry, the accommodation sector is the least automated. Property Management Systems (PMSs) were created to help with front desk, sales, planning, and operations. This was accomplished by maintaining a database that included all reservations, prices, occupancy, and cancellations, allowing the hotel inventory to be managed. Computerized systems are constantly being used by hospitality companies to enhance inventory control, connect with customers, and cut some of their operating costs (Alipour et al., 2011).

E-Hospitality

ICTs have quickly entered the hospitality industry, integrating hotel operations, reshaping marketing functions, increasing overall performance, offering resources for marketing analysis and relationship building, and improving customer service, all while providing strategic opportunities. Furthermore, customers are increasingly expecting ICT amenities in their rooms; internet connectivity via television and data port has become norm in higher hotel categories. The Internet has significantly

enhanced hotel representation and reservation processes. Customers who visit the hotel would appreciate the convenience of booking online because it offers an easy and reliable communication tool. The more offices, transactions, arrivals and departures, and reservations, the more the demand for technology for helping the processes (Sigala, 2014).

E-Tour Operators

ICTs are also important for the delivery of tour operators' packages, as they must continuously communicate with all of their suppliers, including lodging and transportation providers. For tour operators, the introduction of the Internet, Extranets, and Intranets as strategic resources has some advantages. Since it helps tour operators to coordinate operations, address possible challenges, and ensure that customer needs are conveyed to all principals providing the tourism product, timely coordination and sharing of information is critical. ICTs are crucial for tour operators from a strategic standpoint. Kuoni, as an example, allows customers to customize their tourism packages online and create their own itinerary by allowing them to extend their vacation, change their lodging, plan for meals, and include value-added services like car rentals and scuba diving lessons. Tour operators, on the other hand, would undoubtedly need to move their attention away from information provision and reservation mechanisms and toward a strategic position to add value to the product and operation. As a result, tour operators will demand to rethink their core principles and pinpoint new consumer segments that they can serve in the future (Bethapudi, 2013).

E-Travel Agencies

ICTs also significantly improved travel agency's internal organization. Travel agencies have realized considerable synergies, efficiencies, and cost savings through the combination of their back-office (accounting, personnel, and commission tracking) and front-office (ticketing, customer background, itinerary growth, and contact with suppliers) functions. Tighter financial monitoring can be accomplished. The reason is that purchases that ar made in branch offices are recorded automatically back to the head office. Furthermore, transactions include essential marketing analysis data, which can be used to report market trends and assist tactical decisions almost instantly. CRM systems can assist agencies in monitoring the activities of their efficiencies, control, and competition on an individual basis. Storing data in a data center will also assist them in developing proactive marketing tools to target specific consumers with customized goods. So, these increase the value added services provided to each customer and defend disintermediation. As a result, agencies must use modified ICT that is comparable to that used by manufacturers and consumers ("Khal" Nusair et al., 2010).

E-Destinations

The complete tourism supply at destinations is integrated using a destination management system (DMS). Their ability to unite all stakeholders at destinations to enter a global market demonstrates their commitment to strategic management and marketing. DMS provides cutting-edge information and, on occasion, assists with reservations. Also, Destination Integrated Computerized Information Reservation Management Systems (DICIRMS) address the full spectrum of needs and resources needed for particular destinations for both tourism businesses and consumers. DICRIMS provide the infrastructure for all stakeholders, including customers, principals, dealers, and destination marketing organizations, to communicate and conduct business (Buhalis & Wagner, 2013).

Methodology

Research Design

There are two main sections to this research. The first part is based on secondary data, while the second part is based on primary data. In this report, the author attempted to create a conceptual structure for technology deployment in the tourism industry. Based on the conceptual context, secondary data primarily focuses on the infrastructural elements of technology. Furthermore, the section of this study that deals with primary data is a major part of it. This section is divided into two parts. Technological demand makes up one half of the equation, while technological supply makes up the other. To investigate the technical demand side, the author gathered primary data through a questionnaire to collect possible variables of tourist satisfaction. On the other hand, in order to investigate the supply side of technology, the author conducted interviews with tour operators, hotel managers, and others. And, based on the findings of both respondents' reports, the author devised an activities-challenges-prospects approach.

Data Collection

Primary Data

- *Demand side*

  The primary data comprised the tourists' age, gender, and occupation when they arrived in Chattogram, Bangladesh for treatment.

- *Supply side*

Details on the tourism personnel who are also responders were included in the primary data.

Secondary Data

Secondary data from many sources such as websites, journals, and other sources is used to demonstrate the activities and present state of technology in the tourism industry.

Sample Size and Response Rate

Demand Side

A total of 257 people were picked from various tourist attractions in Chattogram, Bangladesh. The sample was taken between November 2019 and January 2020. A total of 350 people were sampled by the authors. Only 300 of the 350 responses were domestic tourists visiting from other countries. However, 50 people declined to participate for personal reasons. 43 of the 300 surveys received were incomplete because respondents were unable to answer some questions (Table 3.1).

The following are some of the regions where usable responses were received (Table 3.2).

The frequency of data by location is depicted in the diagram below (Fig. 3.1).

Result and Analysis

Applications of Technology in Tourism

Mobile Technology

Traveling is unquestionably characterized by mobile technology. Our mobile phones have taken on the roles of travel agency, tour guide, best restaurant locator, map, and many other functions. Throughout the entire purchasing process, it is still by our side. The majority of visitors use their smartphones for all aspects of their

Table 3.1 Sample size and response

Sample size	Total number of responses received	Usable responses received
350	300	257

(Source: authors' survey, 2020)

Table 3.2 usable response

Chattogram City	60
Cox's bazar	125
Khagrachari	32
SAJEK	40

(Source: authors' survey, 2020)
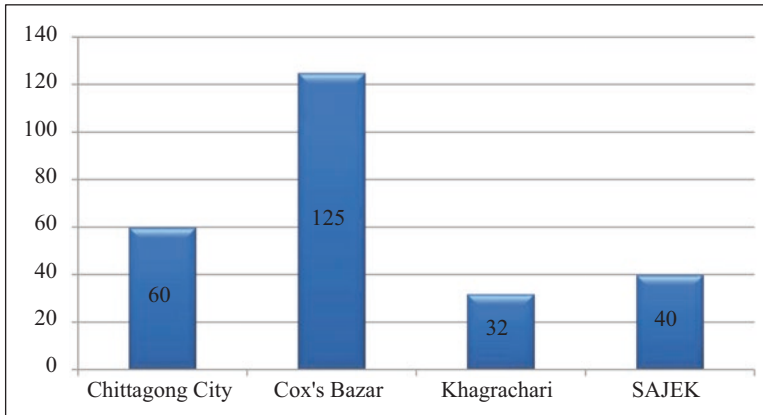
Fig. 3.1 Frequency of respondents by region. (Source: authors' survey, 2020)

vacations. They can use a "Google map" to search the internet. They can also use social media for guidance. Tourists have all of the information they need about their journey in the palm of their hands, thanks to an app they already use, which eliminates the need to download something else (Fig. 3.2).

Below figure shows the scenario of mobile phone uses in tourism. According to our survey, 83% tourists use smartphone for everything during traveling. Only 2% do not use smartphone. The reason behind it is that the people who do not use smartphone in this purpose, they do not know the use of some apps. Most of them are old people. They do not have curiosity to learn the use of the apps or other mobile technology.

Augmented Reality (AR) or Virtual Reality (VR)

Augmented reality holds the capability of empowering tourist companies to portray their services more creatively. Providing virtual tours through accommodation and other facilities with a solitary tap on mobile screens, facilitates the research process for explorers as well as encourages them to settle on better reserving choices. VR app lets someone see the top of the world without climbing to the top. Newer device
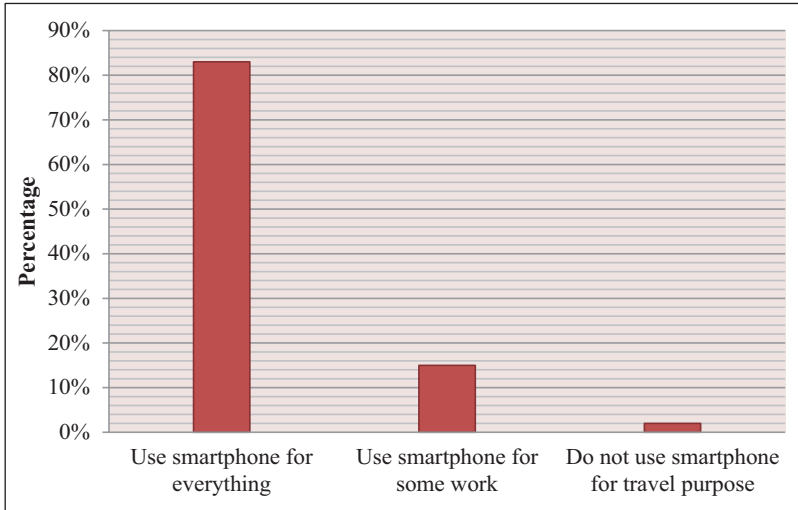
Fig. 3.2 Use of mobile technology by the tourists. (Source: authors' survey, 2020)

models have AR software already integrated into the phone. For example, iPhone (iOS 11.0) or the ARCore app installed from the Google Play Store can provide the AR service.

The following Figure shows the result about AR/VR knowledge in Bangladesh (Fig. 3.3).

Unfortunately, the use of AR or VR is very few in Bangladesh. Though people use smartphone, but most of the people are not able to buy iPhone. According to our study, only 31% tourists know about the AR or VR. 69% tourists even do not know about these apps.

Internet of Things

The Internet of Things (IoT) is a network of physical objects—"things"—that are implanted with sensors, software, and other technologies in order to communicate and exchange data with other devices and systems over the Internet. Sensors connected to the Internet are being integrated into vehicles, bags, homes, and other objects. Customers at some Virgin Hotel hotels can use an app to connect to the room's thermostat or monitor the TV. There are also bags with electronics that allow clients to watch their baggage at any time using their phones, allowing them to prevent losing stuff at the airport or other public locations (Fig. 3.4).

Below figure shows the application of internet of things in Bangladesh. According to our survey, only 12% use internet of things whereas 88% do not use internet of things. In general, internet of things is quite expensive. In Bangladesh, most of the people belong from middle class or lower class family. They cannot afford the costs of internet of things. 12% tourists who utilize this facility have a background of residing abroad. They are very familiar with the service and also enjoy a lot.
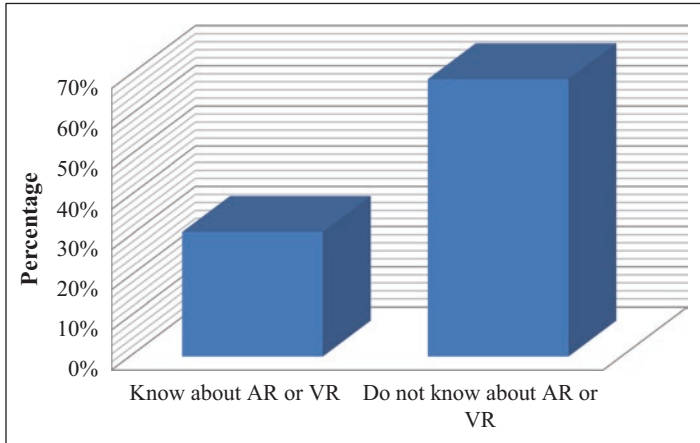
Fig. 3.3 Scenario of AR/VR Knowledge. (Source: authors' survey, 2020)
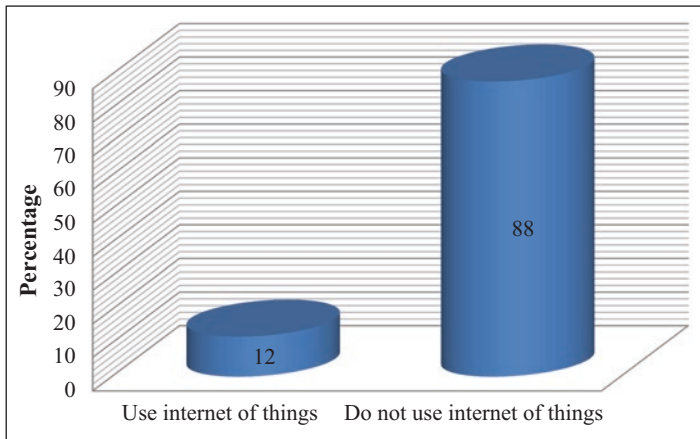
Fig. 3.4 Application of Internet of Things. (Source: authors' survey, 2020)

Virtual Assistance

This is an open technology that companies can utilize and customize to meet their own requirements. Some virtual assistants will answer all of our questions, such as how to switch on the radio, check email, and so on. Inns are now enrolling this "support" as a result of the emergence of virtual assistants who are specially intended for this setting. IBM's Watson Assistant is an AI-powered virtual assistant that gives users intuitive and personalized information.

In the below Fig. 3.5, we can get a clear picture of the scenario of virtual assistance in Bangladesh. According to our study, 67% tourists utilize virtual assistance during traveling. Only 33% do not utilize the facility. The reasons behind not using

Fig. 3.5 Virtual assistance.
(Source: authors' survey,
2020)
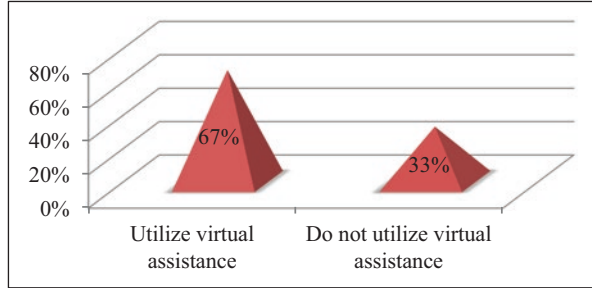
are: (i) Some do not have Smartphone; (ii) some do not know about the use of vir-
tual assistance etc.

Big Data

There has been a lot of talk about Big Data lately, but no one seems to be able to
display all of the opportunities it provides for the tourism industry. Regardless, it is
already being used by a number of industry players. The inn network uses the infor-
mation gathered about their guests to choose the ideal target for their marketing
efforts. In essence, they review their data collection and look at the amount spent,
the reason for the trip, and the place of origin, then cross-reference this information
with public data from government sources to construct the most relevant client pro-
file and increase their success rate. As a result, they establish a higher division for
their missions in order to improve their viability and advance the venture required
to execute them.

We also interviewed the hotel managers to know the information about it
(Fig. 3.6).

According to our survey, 98% hotel managers stated that they use big data for
further progress. Only 2% do not use big data. This is obvious that it is a good thing
for us. Our hotel industry has improved a lot recently.

Blockchain

Blockchain is a technology that has the potential to transform the world as we know
it. Despite the fact that it is mainly associated with banking, it gives the impression
that it may have an effect on travel. Although there has not been much testing, it's
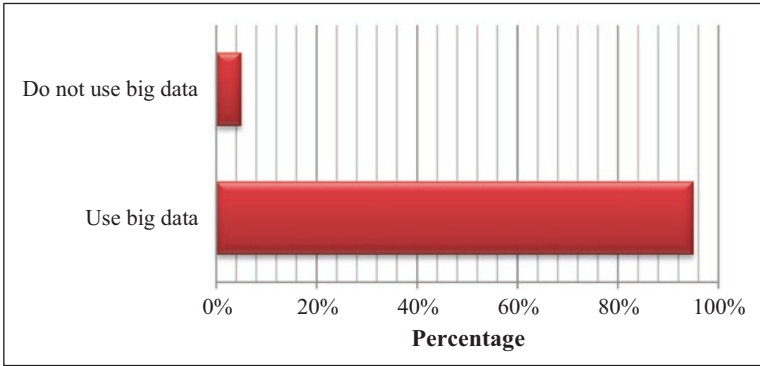
Fig. 3.6 Scenario of utilizing the big data. (Source: authors' survey, 2020)
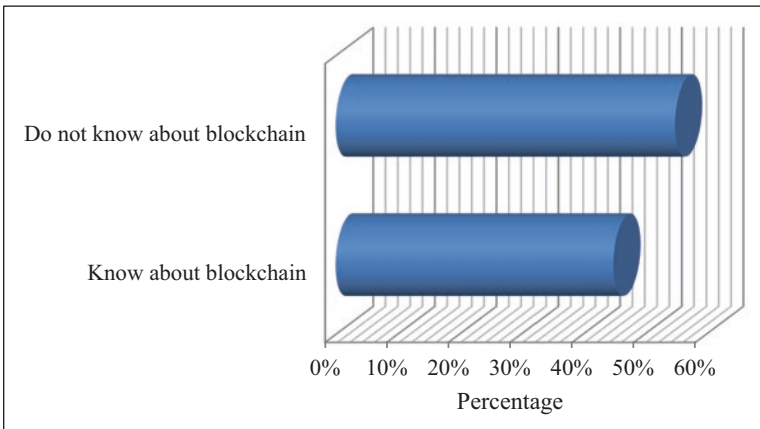
Fig. 3.7 Scenario of block chain knowledge. (Source: authors' survey, 2020)

possible that it would be useful in identifying travelers at the airport, maintaining transparency in sightseers' views, and facilitating quick and safe payments. In an increasingly digital environment, block chain is an evolving technology with numerous advantages. It makes use of a digital signature feature to facilitate fraud-free transactions, making it impossible for various clients to alter or destroy a person's information without a specific digital signature.

It is programable and can produce precise activities, occasions, and installments consequently when the criteria of the trigger are met (Fig. 3.7).

Clearly, more than half of the tourists in our sample do not have any idea about the block chain technology. Only 45% tourists are aware of it. To adapt with the improved technology more information should be provided to general people by the authority.
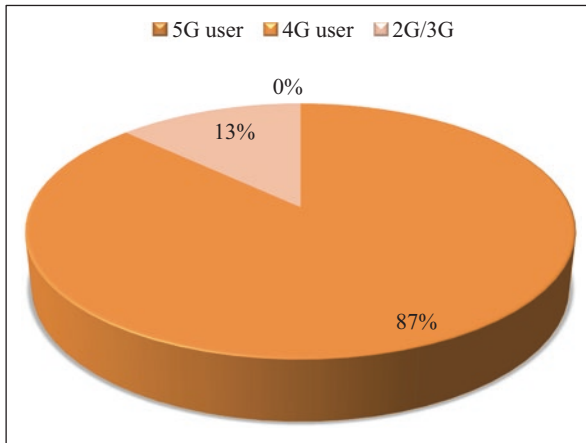
Fig. 3.8 2G/3G, 4G and 5G Users. (Source: authors' survey, 2020)

5G Technology

With the help of the 5G network, travel creativity becomes even more impressive. They ensure much faster loading and downloading rates, as well as more comprehensive inclusion and more stable connections. With several times the download speed of 4G, 5G allows us to build and transmit creativity that was previously impossible. As a result, the interconnectedness between smart devices can become more effective to fully appreciate the Internet of Things (IoT). Immersive tourism, in which technology turns visitors into the hero of the experience, will become a reality. In addition, augmented reality (AR) or 360° video will become more widespread and available (Fig. 3.8).

In the above figure, it is clear that 5G is not available in Bangladesh yet now. However, 4G network is available here. And according to our study, 87% tourists are 4G user. On the contrary, 13% tourists are using 2G/3G network. They opined that 2G/3G also provide such a network which is not bad at all. Those who are using 4G network, they stated that 4G is quite enough to browse during traveling.

Supply Side of Technology in Tourism Industry

A hotel employee named Foysal Ahmed (26 years old) said, "overall performance of technology in the hotels is good. Their colleagues are very responsible and serious".

Ziaul Hoque (33 years old), an employee said, "I found that the services are excellent. Especially the tourists are highly satisfied due to advanced technology".

A tour operator, Akter Kamal (21 years old) said, "All his colleagues are very well-behaved".

Demand Side of Technology in Tourism Industry

Information Collection Medium

The authors gathered data in order to learn more about how tourists gather information. Since data plays such an important role in tourism marketing, it is essential to understand it in order to reform a business design. The table below depicts a straightforward picture of the information gathering medium (Table 3.3).

As can be seen from the table below, the majority of tourists (more than 50%) received information from friends and relatives. The internet, which is a technology, is the second most used medium. However, there is a significant difference between these two mediums. The percentages of tourists who obtained information from magazines and guides, the media, as part of a travel package, through a travel agent, and from other sources are 5,3,2,3 and 1, respectively. It is obvious that modern marketing design has a lot of potential to change certain industries. The questionnaire included a question about "fairs and exhibits." No visitors have chosen this as a mode of transportation. As a result, tourism fairs/exhibitions can clearly be organized to draw more visitors.

Booking

Tourists were asked about the information gathering medium, that is, from where, they get to know about the place. Authors found that people gathered information from different sources such as travel agency, friends and relatives, internet and others.

Figure 3.9 below shows that most of the tourists (42%) booked through travel agency. A good number of tourists (41%) were influenced and also got booking help by friends and relatives. Percentage of tourists booked through internet and others are 11% and 6%, respectively.

Table 3.3 Information gathering medium

Information gathering medium	% of tourists
Friends and relatives	56%
Magazines and guides	5
Media	3
Part of travel package	2
Internet	30%
Travel agency	3
Others	1

(Source: authors' survey, 2020)
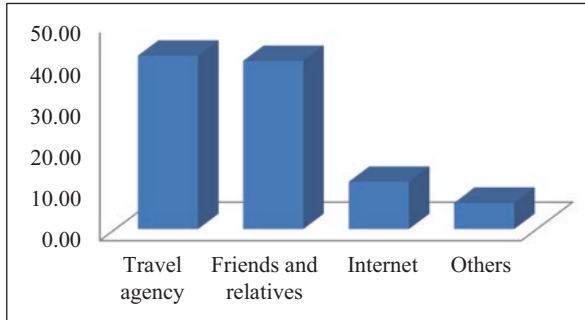
Fig. 3.9 Booking medium. (Source: authors' survey, 2020)

Application of Technology in Tourism Marketing

Respondents were asked about marketing technologies. More than 40% of those polled said they were pleased with the technology. Just 7% of people thought the technology in the marketing industry was bad, while 13 percent, 4%, and 24% thought it was outstanding, very good, and good. However, 52% of respondents said that marketing technology is average (i.e. business as usual) (see Fig. 3.10).

Technology in Booking Systems

The technology in the booking system was discussed with the respondents. "Excellent," said 45 percent of respondents. This aspect was rated as very good or good by 23 percent and 21 percent of respondents, respectively. However, 10% and 1% of respondents rated this aspect as "average" and "poor," respectively. They stated that the preservation of this natural resource is insufficient. For the preservation of the waterfall's beauty, a proper strategic plan is needed (Fig. 3.11).

Technology in Accommodation Industry

A good number of people (56%) stated that they got technological support in accommodation industry such as in hotels or cottages. 27% and 14% people opined that the technologies in accommodation industry are very good and good. Only 3% respondents' replies were average (Fig. 3.12).
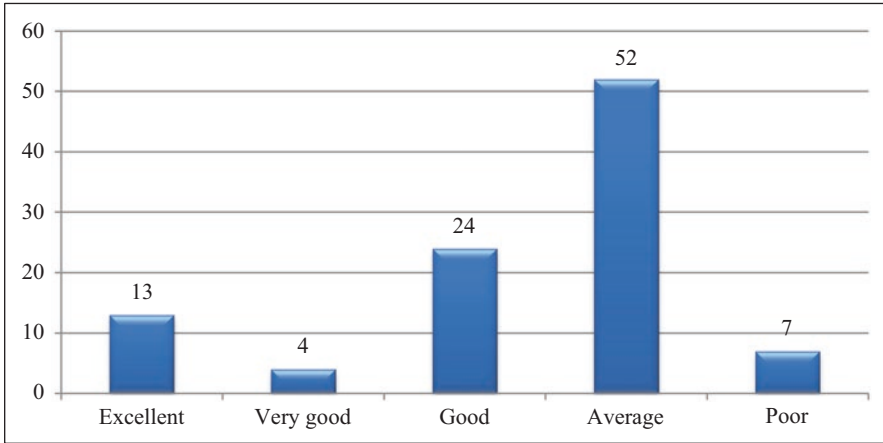
Fig. 3.10 Technology in marketing. (Source: authors' survey, 2020)
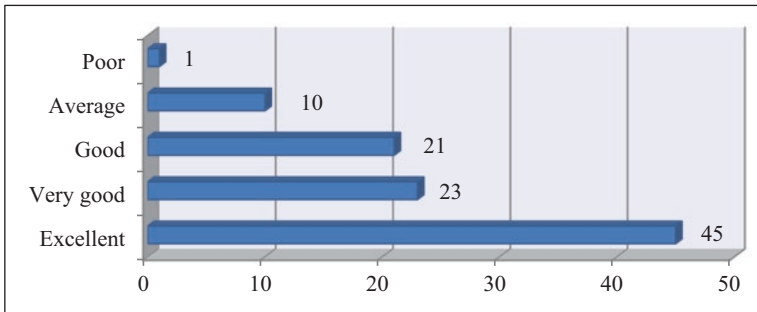
Fig. 3.11 Technology in booking system. (Source: authors' survey, 2020)

Technology in Restaurants

In Fig. 3.13, we can see that out of 100% respondents, 41%, 22% and 16% people opined that technological supports in restaurants are excellent, very good and good respectively, whereas only 9% people opined the quality as poor. However, 12% people mentioned that the technology is as usual.

Technology in Transport Industry

A large percentage of people (around 30%) thought boating was excellent, while more than 15% thought it was bad. They also explained their reasoning for making a negative statement. They drew attention to the transportation authority's weak
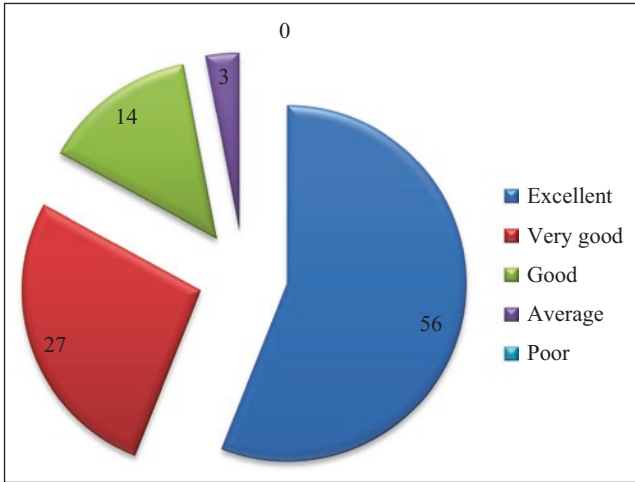
Fig. 3.12 Technology in accommodation industry. (Source: authors' survey, 2020)
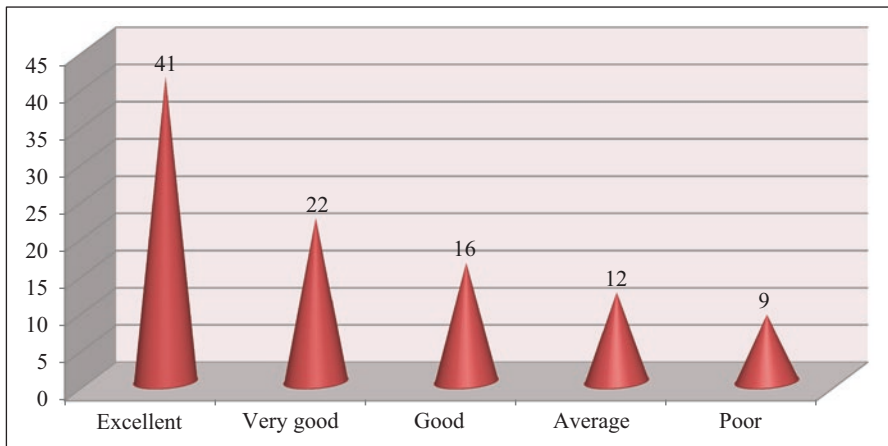
Fig. 3.13 Technology in restaurants. (Source: authors' survey, 2020)

management structure. The majority of the cars are very vintage. Those should be replaced with new vehicles by the authority. Otherwise, unanticipated mishaps can occur. However, less than 20% and less than 10% of respondents, respectively, rated the boating as very good and good (Fig. 3.14).

Technology in Tourist Spots

Authors tried to explore the satisfaction level of some factors in Bangladesh. As we can see from the diagram, 33% people opined that technology in tourist spots are poor and 13% people opined that nature is as usual. 32% and 12% respondents scored these two factors as excellent and very good respectively (Fig. 3.15).

Application of Technology in Tourism Products

Impression of a good number of people (85%) regarding telecommunications was excellent, whereas 5 people scored this factor as good. However, 10% respondents scored the telecommunications as very good (Fig. 3.16).
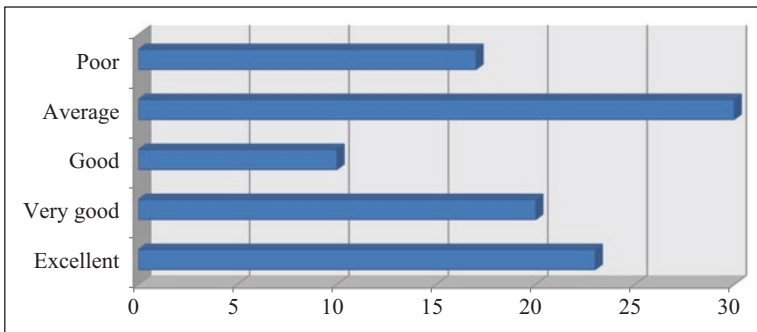
Fig. 3.14 Technology in transport industry. (Source: authors' survey, 2020)

Fig. 3.15 Technology in tourist spots. (Source: authors' survey, 2020)
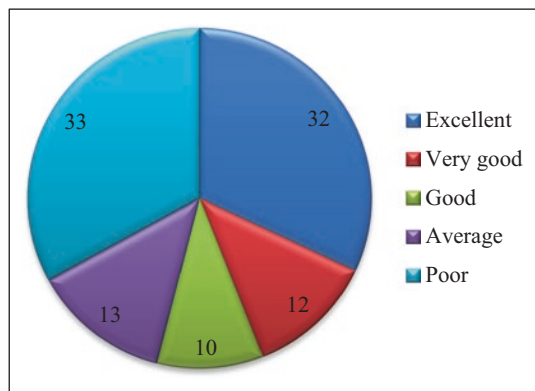
Televisions and Satellites

Another critical aspect that can affect visitors is television and satellite. Telecommunication services were rated excellent and very good by 90 percent and 5% of respondents, respectively, out of a total of 100 percent of respondents (Fig. 3.17).

Wi-Fi Connection

The respondents were asked how satisfied they were with their Wi-Fi link. The places were rated outstanding, very good, and good for Wi-Fi connection by 66, 22, and 5 respondents, respectively. However, 7% of respondents had a different view, stating that the places are average and bad for Wi-Fi access, respectively (Fig. 3.18).
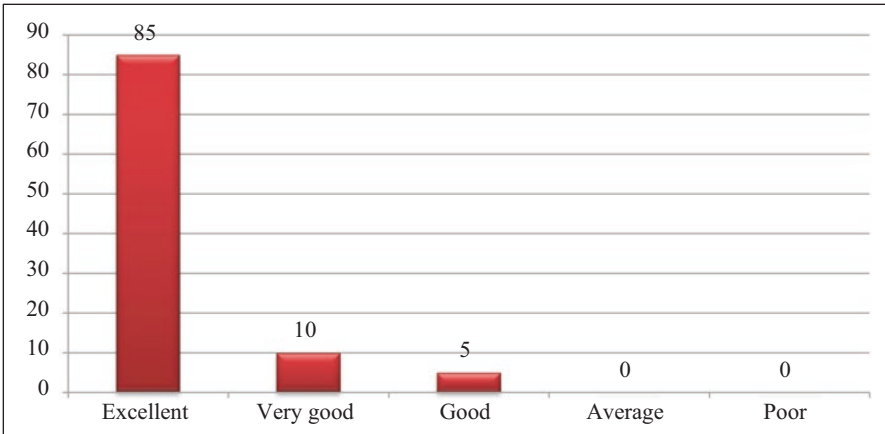
Fig. 3.16 Telecommunications. (Source: authors' survey, 2020)
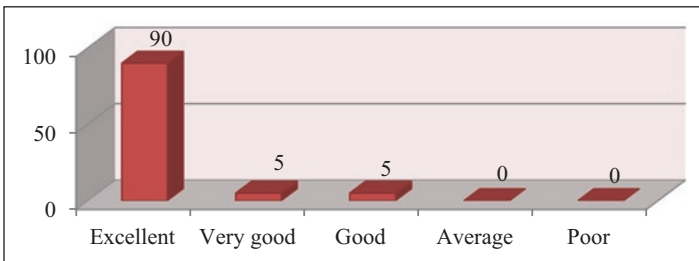
Fig. 3.17 Television and satellites. (Source: authors' survey, 2020)

Air Condition

Air condition is another important factor of accommodation and restaurants that can influence the tourists. Out of 100% respondents, 78% and 11% respondents opined air condition services as excellent and very good respectively. 5% opined air condition is good. Only 1% opined it as poor (Fig. 3.19).
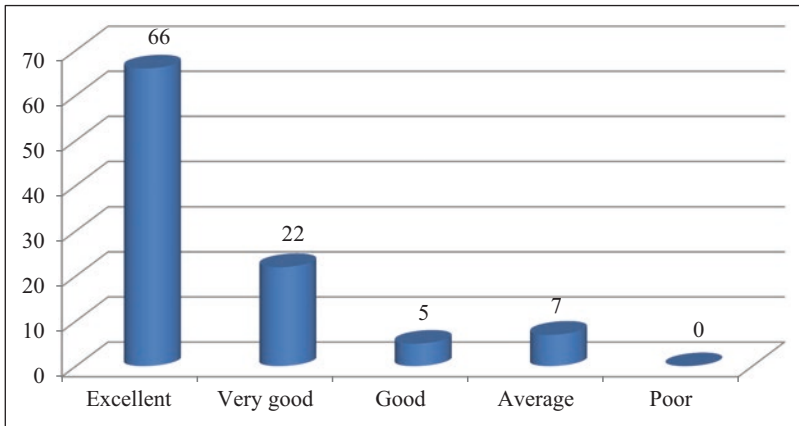
Fig. 3.18 Wi-Fi connection. (Source: authors' survey, 2020)

Fig. 3.19 Air condition. (Source: authors' survey, 2020)
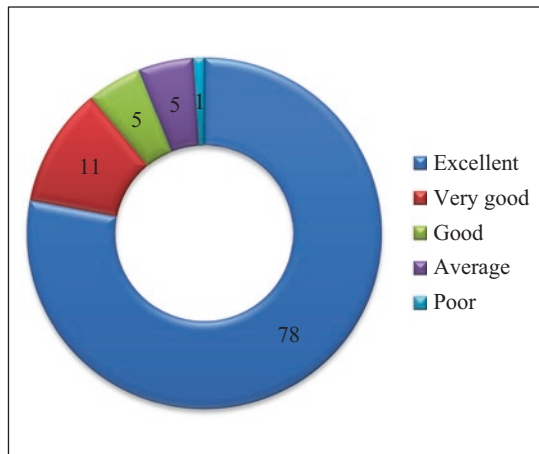
Washing Machine

Authors tried to explore the satisfaction level of the factors in Bangladesh. As we can see from the pie diagram, 52% people opined that washing machines in accommodation places are in excellent condition and 12% people opined that condition is very good. 10% and 10% respondents scored as good and average. 16% tourists scored washing machine as poor (Fig. 3.20).

Based on the findings, we may infer that technology plays a significant role in the growth of tourism and is therefore an unavoidable part of the industry's expansion. The majority of hotels and tourism organizations need technical upgrades to keep up with current trends. Travel is one of the most important aspects of tourism, so online reservations, especially for lodging, are crucial. In Bangladesh, more understanding of the knowledge process is needed, as well as ICT training at various levels of tourism, travel, and hospitality enterprises. As a result, tourism education in Bangladesh should place a strong emphasis on technology. Bangladesh should strive to increase the adoption of technology among the general public, as this is critical to the country's development. It should be noted that this is the most effective method of doing business in the tourism industry. Tourism companies should offer more resources to consumers in this line that are conveniently available to everyone in their locations. Bangladesh's government bears a significant amount of responsibility for streamlining ICT use among stakeholders (B to B) and clients (B to C). Websites for tourism should be upgraded and revised on a regular basis. More options for B2C and B2B customers to pay for their reservations using their mobile phones are required.
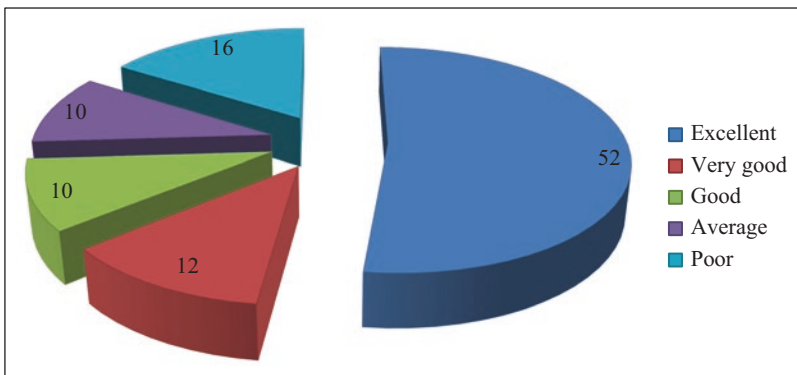
Fig. 3.20 Washing machine. (Source: authors' survey, 2020)

Strategic Model of One Stop Service for Technology in Tourism

The customer's experience with technology in tourism is the most important factor that affects his or her happiness, which influences the likelihood of returning. As a result, developing a framework that can provide travelers with a positive experience should be a top strategic priority for travel agencies and their administrators. Many agencies have a one-stop service system for their clients, which may include booking, lodging, transportation, and other services.

Bangladesh can follow the above model to improve the technological industry in tourism. Application of technology should be encouraged regarding tourists' spots, travel agent management, package management, transportation, booking, accommodation etc. In Fig. 3.21, a conceptual strategic model of one stop service has been drawn. If an agency can provide all the services together, tourists will be more interested to visit a place.

Suggested Strategies

A significant role is played by technology in the field of tourism and the tourism industry since a decade ago. Use of technology in the tourism industry has straightforwardly helped in diminishing the expense, improving administrations, and upgrading operational proficiency and client experience. Following strategies should be adopted to improve the current status in Bangladesh:

- Internet operators should provide better internet facilities so that tourists can easily get access to all the information.
- Tourism industry should follow up the tourism business and purchaser patterns closely.
- All the travel agencies should adopt creative, updated and innovative marketing approaches.
- Authority should arrange continuous training and periodical updates of tourism staff.
- Tourism industry should utilize the social media marketing (usage of Facebook, Twitter) and social commerce as an integral part of the tourism industry's online marketing mix.
- Travel agency should serve totally new tourism products and/or services to the market served.
- Travel agency should try to market different products, different services, offer excitement as well as an adventure, tell a story beyond the product for sale, look for and apply differential advantage in any way possible.

Conclusion

This study was set out to portray the use of technological gadgets in the tourism industry. Proof brings to light that the utilization of gadgets revolutionizes the tourism industry, in this way making added an incentive for the two providers and tourists. This study further affirms that technological device transforms consumers from tourists to explorers. Nowadays, nobody doubts that technology and travel complement each other. The usage of technology in the tourism industry and the hospitality industry has revived the action and made the travel process proficient and charming. Technology helps in big-chain hotels and contributes significantly for all travel agencies and inns in the tourism business. To boost tourism business operations, it is critical that existing technology be modified, improved, and seamless integration achieved both internally and externally. New technology is transforming the way we fly, and these enhancements ensure a much more intuitive and energizing experience. Technology incorporation in tourism will help both service providers and consumers, while also bringing together other stakeholders on a single platform. The use of technology has a number of advantages, including lower prices, improved operational productivity and/or profit levels, meeting evolving customer demands, integrating increased versatility in adjusting supply to changing demand profiles, and assisting the firm in standing out from the crowded market by having and communicating a competitive advantage.

It is critical to choose the best information communications technology method to fit consumer needs to service dimensions. Professionals will be able to use the latest tools to retrieve information, recognize suitable items, and make reservations as the use of technology spreads across the tourism distribution channels. Integration of technologies is an important tool that can help promote and improve the tourism industry.

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Chapter 4
Technological Innovation Application in the Tourism and Hospitality Industry of Bangladesh

Tauhid Ahmed Bappy and Md. Ashikur Rahman Avi

Abstract Application of Innovative Technology (IT) has significantly altered the policy, structure, strategy and role of the tourism and hospitality industry and its associated institutions around the world. If applied successfully, IT works as the driving force for tourism and hospitality development and competitiveness. Considering these, this chapter aims to explore how innovative technological application is advocating the tourism and hospitality industry in the context of a developing country, Bangladesh. In addressing the chapter aim, a brief overview of the tourism and hospitality industry of Bangladesh is covered and then the degree to which innovative technologies are being adopted by the stakeholders associated with the tourism and hospitality industry is explored based on the secondary literature studies. Finally, the chapter closely looked into the paradigm shift in the tourism and hospitality industry of Bangladesh that is likely to occur in near future as a result of technological innovation, and also highlighted the probable challenges to be faced by the tourism and hospitality industry of Bangladesh due to COVID-19 pandemic, while proposing several technological solutions to tackle such challenges. The chapter sets a benchmark for the policymakers, stakeholders of the tourism and hospitality industry in Bangladesh.

Keywords Innovation · Technology · Tourism · Hospitality · Bangladesh

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Introduction

The advancement of technology over the years has brought about significant changes and improvements in the travel, tourism and hospitality industry around the world (Buhalis, 2019). In fact, technology and tourism have turned out to be two inseparable things (Serravalle et al., 2019). Studies suggest that a typical tourist explores nearly twenty two websites related to tourism and hospitality before departing for a vacation; additionally, it has been also reported that more than 70% of the commercial travelers utilize their mobile or smartphone devices to reserve flight tickets (Vong, 2020). The uses and applications of "technovations" such as Augmented Reality (AR), Virtual Reality (VR), Artificial Intelligence (AI), social media platforms, tourist rating sites, Internet of Things (IoT), thousands mobile or smartphone software apps, big data analytics, block chain, and sharing economy, are apparently evident in various aspects of travel, tourism and hospitality associated industry (Chatzigeorgiou & Christou, 2019; Nam et al., 2021; Pourfakhimi et al., 2020; Li et al., 2018; Wise & Heidari, 2019; Yung & Khoo-Lattimore, 2019).

According to Parte and Alberca (2019), the international travel and tourism market accounts for 266 million employments and results in 9.5% of the Gross Domestic Product (GDP). In particular, Asian countries such as Taiwan, Malaysia, Indonesia, and China, are also progressing more rapidly in the field of travel and tourism as a result of growing disposable incomes of their population and Bangladesh is no exception (Ishtiaque, 2013). This small land hosts a lot of tourism treasures such as the longest unbroken sandy sea beach of the world, the largest mangrove forest, hills, island, thousands of religious and archeological sites, wetlands, waterfalls, diversified culture, and many more to amaze the tourists from different corner of the world (Muneem & Avi, 2017), even the rural areas of this country offer unique experiences to the tourists (Rahman et al., 2018). Although the contribution of this industry to the country's GDP is still insignificant, the inbound tourists in the country are growing each year due to the realistic measures adopted by the government in an attempt to attract global tourists by means of branding the country as "Beautiful Bangladesh" in front of the world (Daily Sun, 2020).

According to Bangladesh Tourism Board (BTB), approximately 323,295 inbound tourists traveled Bangladesh in 2019 which represents 21 times greater compared to the number of tourists visited in 2018 (Daily Sun, 2020). Besides, every year, nearly 7 million domestic tourists visit several tourism destinations of Bangladesh, such as Cox's Bazar, St. Martin's Island, Bandarban, Sundarbans, Sylhet, Kuakata, Dhaka, Cumilla, Bogura, and Dinajpur, to name a few (Rahman & Chakma, 2018). It is believed that the rise of domestic and international tourists in Bangladesh could not have been achieved without the contribution of the innovative technologies; because the "technovative" tools and devices has allowed the travel enthusiasts to easily investigate the condition of the destination ahead of starting their trip (Howlader, 2018; Karim, 2018).

In the earlier days, the tourists used to rely upon the tour operators or travel agencies for such information but now-a-days, as a result of the proliferation of

innovative technologies, Bangladeshi visitors can become familiar with the tourist places of interest, conditions of the lodging facilities, as well as can investigate the dependability of the travel offerings via several software apps or web solutions by using their personal digital devices (Mowla, 2019). With the assistance of "technovations" in the country's tourism and hospitality industry, tourists can likewise prebook their hotels, meals, and vehicles online (Islam, 2012). As a consequence, it becomes possible for the tourists to stay away from all tensions of preceding a tour. Furthermore, GPS tools assist Bangladeshi travelers to effortlessly wander around any unfamiliar tourism places of interest (Howlader, 2018).

Innovative technologies also offer several opportunities to the thousands of tourism service providers all over the world (Li et al., 2017). In Bangladesh, marketers of tourism services frequently utilize digital platforms, particularly social media, to promote their offerings and to provide varieties of packages with the intention of grabbing the interest of probable tourists (Karim, 2018). In addition, advanced "technovations" allow tourism service marketers to track the online behavior of the tourists and thus helps them (marketers) to deliver customized travel solutions that fit the individual profiles and interests of the tourists or guests (Liu et al., 2013; Mariani, 2019). Keeping all these trends in view, the authors have planned to design this chapter to focus on the innovative technological application in the tourism and hospitality industry of Bangladesh.

This chapter is aimed at fulfilling the objectives: first, to provide an overall in-depth view of the technological innovation in tourism industry. Second, to highlight the extent to which the tourists and tourism service providers in Bangladesh are adopting digital technologies at present. Finally, to provide future directions with regard to the use of innovative technologies as a recover strategy in the post-COVID-19 situation.

To fulfil the aforementioned objectives, several reputed journals, such as "Tourism Management", "Journal of Travel Research", "Tourism Review", "Information Technology in Tourism, "Information and Communication Technology in Tourism", and so on, were reviewed from June 03 to July 03 to obtain insights with regard to the digital revolution in the tourism and hospitality industry. Besides, articles published on local newspapers of Bangladesh have also been read thoroughly to understand the country's readiness to adopt technology for making travel decisions. In addition, discussion with industry experts and academicians has helped the authors immensely in the fulfillment of chapter objectives.

Technological Innovation and the Tourism Industry

The practice of developing new opportunities by means of employing innovative technologies is known as technological innovation or "technovation" (Ng et al., 2019). Technological innovation has brought about a paradigm shift in the tourism and hospitality industry all over the world (Buhalis, 2019). Before analyzing the uses of technology in various fields of tourism, it is important to identify the areas

that the tourism industry encompasses. According to Biederman (2008), tourism industry includes a wide range of areas and actions associated with the temporary movement of the tourists to destinations outside their usual residence. Figure 4.1 outlines the industries associated with tourism and hospitality industry. Each of these industries, more or less, reaps the advantages of several technological tools.

As evident in Fig. 4.1, tourism and hospitality industry encompasses several other industries like transportation, accommodation, food and beverage, entertainment, and other affiliated industries, to name a few. In the field of transportation subindustries, the uses of technological innovation are immense. These days, almost every airline/railway service provider has its own website or apps through which tourists and visitors can purchase tickets and reserve their seats (Taneja, 2016; Smit et al., 2018); besides, biometrics is being used for the purpose of passenger processing in the airports (Farrell, 2019). In addition, some of the airlines have started adopting block chain technology in an effort to innovatively implement loyalty programs, automate billing settlements between travel agents and airlines, protect travelers' booking information, and track tourists' belongings (Agrawal et al., 2018). Furthermore, several airports have introduced AI driven tools, such as robots, chatbots, and virtual assistants, etc. in order to enhance service performance and competence (Saadi et al., 2020). Also, modern day tourists can enjoy the benefits of ride sharing technologies such as Uber, Grab, Lyft, OLA in the travel destination sites (Park, 2020).

Industries	Subindustries	Effective technological application
Transportation	Airlines, Car Rentals, Water Transport, Coach Services, Railways	E-Ticketing, Online Booking, Biometric Terminal, Block chain for settling payments and Baggage Tracking, Onboard Connectivity, Robotics, Artificial Intelligence, Self-Service Technology, Ride Sharing Services
Accommodation	Hotels, Resorts, Motels, Shared Accommodations, Hostels, Camping, and so on	Wi-Fi (must), Online Booking, Automation, Robotics, Sensors, Smart Room Keys, Ratings on Social Media, Remote Check-Ins/Check Outs, CCTV, Sharing Economy Accommodations (Airbnb)
Food & Beverage	Restaurants, Catering, Bars, and Cafes	Social Media Promotion, Cloud Kitchen, Food Blogging, eWoM, Check-Ins, Google Map, Online Food Home Delivery Services, Automations, Digital Inventory Tracking, Kiosks, Digital Table/Reservation Manager
Entertainment	Casino, Nightclubs, Shopping, Adventurous Activities, Theme and Amusement Parks	RFID and Facial Recognition Systems in Casino, QR Codes, Digital Price Tags, Self-Check Outs in Retail Shopping, Use of Websites and Apps for Online Shopping
Connected Industry	Financial Services, Travel Agents, Tour Operators, Online Travel Agencies, Tourism Organizations	Wide Use of Co-branded Credit Cards, Gamification, Virtual Reality, Augmented Reality, Big Data for Behavioral Targeting, Social Media Marketing, Website or App-Based Travel Packages

Fig. 4.1 Effective technology application in the tourism industry. (Source: compiled by the authors, 2020)

In accommodation industry, the innovative applications of technology are apparently evident. Today, hospitality service providers must offer Wi-Fi services to their guests or tourists. Now, tourists from different parts of the world can make online hotel bookings using popular platforms such as booking.com, Agoda, and Trivago (Pitchayadejanant et al., 2019). It has turned out to be a common practice of the tourists to rate the services of the hospitality properties they already experienced on several social media platforms like Facebook, and Instagram or rating sites such as Tripadvisor and, Yelp (Kotler et al., 2016). The positive or negative online reviews attract or discourage the potential tourists to/from visiting particular hospitality properties such as hotel, motel, resort etc. (Bore et al., 2017). Moreover, hotel visitors, today, use smart room keys via smartphone apps as an alternative to plastic keys. On the other hand, some of the accommodation service providers enable their guests to remote check-in and out with their mobile or smartphone devices. Besides, the accommodation industry is using numerous sensors for the purpose of detecting smoke, gas, heat, occupancy, and so on (Chan et al., 2017). Also, CCTV cameras are deployed at different corners of a hotel to ensure safety of the tourists as well as to protect the possessions from theft. On the other hand, sharing accommodation services such as Airbnb has disrupted the lodging industry with their up to date digital technologies (Guttentag, 2015). Airbnb ensures economical rates and room availability at the certain tourism destinations at the time of overfull hotels demands (Gerdeman, 2018).

The food industry is also an integral part of the whole tourism and hospitality industry. At present, restaurants, bars, cafe businesses are taking the advantage of digital marketing tools, social media in particular, as it has become extremely convenient for them to reach narrowly defined target audiences with their tailored campaigns. Restaurants customers are constantly noticing reviews from an increasing number of food bloggers who constantly upload food related videos on YouTube or upload photos on Instagram, helping the food industry to flourish beyond imagination. In addition, people are using Google Map to find out nearby restaurants. Besides, the huge rise of food delivery apps such as Uber Eats, Doordash, Grabhub, Deliveroo, and so on has opened up new sales and delivery channels for restaurants. Recently, the concept of cloud kitchen has added new dimensions in the hospitality industry. Basically, a cloud kitchen, also known as ghost kitchen, is a delivery-only restaurant which does not have any physical storefront for the customers and normally operates in a commercial and centralized kitchen and partners up with third party delivery service providers for distributing the food offerings to the public. Customers cannot visit these restaurants because there are no physical dine-in facilities. The only way customers can have their products is by ordering foods through different apps (Uber Eats, for instance). Apart from cloud kitchen, technologies, such as digital inventory trackers, kiosks, digital table/reservation manager, are enhancing the efficiency of the restaurants, cafe and bars.

Several connected industries related to tourism such as financial service providers, travel agents, tour operators, are using various digital technologies as well. For instance, financial service providers are offering airline/hotel/retail co-branded credit cards which provide additional privileges to the tourists in the form of

coupons, club membership, and so on (Wang & Hsu, 2016). In addition, travel agents and tour operators are coming up with one stop solution on their websites where potential tourists can obtain necessary details on travel packages as well as flights, hotels, transportation, and destination attractions related information (Ivanov & Atanasova, 2019). Moreover, travel organizations are offering the potential customers a more lifelike experience of the hotel rooms they would stay in, or the tourist attractions that are nearby through the use of VR technology and use of 360° cameras. The use of such innovation provides the tourists hands on experience before making the actual decision to travel as it is a much more immersive and engaging version of the traditional way of just posting pictures on the website (Disztinger et al., 2017; Yung & Khoo-Lattimore, 2019; Loureiro et al., 2020). These technologies empower the tourism service providers to enhance user experience by offering an 'attempt ahead of purchase' alternative for the potential clients (Zhang, 2020).

Besides, with the use of big data (large volume, variety, and velocity of data which cannot be processed by traditional data processing tools), travel agencies, tour operators as well as tourism organizations may explore novel methods of utilizing various data sources to create relationships with potential tourists at several phases of a tour (Song & Liu, 2017). Today, tourists' interest, preferences, dislikes and other activities on the digital platform can be tracked easily using technovative devices which allow travel organizations to obtain huge volume and variety of data with regard to everything that is pertinent to each phase of a tour. Big data generated from the tourists are further utilized by the tourism marketers to comprehend the ever changing tourist demographics in a better way (Salas-Olmedo et al., 2018). This also allows the travel agents or tour operators to predict tourism demand (Song & Liu, 2017) and to retarget the potential tourists with customized solutions (Li et al., 2018).

Several prior literatures have pointed out that the adoption of technologies in the field of tourism and hospitality industry is basically determined by a number of factors. Table 4.1 depicts the determinants of technology acceptance in the tourism industry from several authors' point of view.

Application of Innovative Technology in Tourism and Hospitality Industry of Bangladesh: The Present Situation

Presently, the tourism industry of Bangladesh has come to a standstill due to COVID-19 pandemic. According to the report of The Business Standard (2020a, b), the case of COVID-19 patient in Bangladesh was first identified in March, 2020. Subsequently, the government had decided to shut down all the public gatherings at the tourist spots due to immense fear of this virus (Lalon, 2020). In particular, the tourist spots, hotels, and airlines were nearly vacant during the peak period of "Pahela Baishakh" (first day of Bengali New Year) and Eid-Ul-Fitr (Dhaka Tribune,

Table 4.1 Determinants of technology adoption in the tourism industry

Technologies	Factors	Sources
Self-service technologies	Perceived risk, trust, perceived ease of use, perceived usefulness, technology readiness, preference for personal contact and demographic variables	Kelly et al., (2011)
Online hotel reservation systems	Compatibility, firm size, technology competence, and critical mass	Wang et al., (2016)
Smartphone apps	Performance expectancy, social influence, price saving, perceived risk, perceived trust and prior usage habits	Gupta et al., (2018)
E-marketing in tourism firms	Internal factors, external factors, ease of use, relative advantage, compatibility, implementation tools	El-Gohary, (2012)
Virtual reality for travel planning	Perceived immersion, interest, perceived enjoyment and perceived usefulness	Disztinger et al., (2017)
Online travel agencies	External variables (information, factor, price, convenience, brand names, promotional factor, entertainment factor, usability), attitude, ease of use, perceived usefulness, degree of involvement	Cho & Agrusa, (2006)

(Source: compiled by the authors, 2020)

2020a). These are basically two of the largest festivals in Bangladesh on which huge number of tourists used flock towards amusement parks, tourist spots, sea beaches, and other areas of attractions. Reports suggest that the deadly corona virus has resulted in the closure of several travel and tourism organizations, hotels, resorts, parks, airlines, transports involved in tourism, restaurants, and cafes (The Daily Star, 2020a). As a result, tourism industry of Bangladesh has experienced a loss. According to the prediction of The World Tourism Organization (UNWTO), this year Bangladesh is going to face a loss of BDTk. 40 billion (The Business Standard, 2020a, b).

However, before COVID-19, tourism and hospitality industry of Bangladesh was running at a steady pace despite having limitations with regard to infrastructure, safety, and high cost of doing business (Daily Sun, 2020). Technological adoption among the tourists and tourism companies has been on the rise over the last couple of years (Howlader, 2018; Karim, 2018). According to Bangladesh Telecommunication Regulatory Commission (BTRC), the absolute number of the Internet subscribers in Bangladesh arrived at 103.253 Million till March, 2020 (BTRC, 2020) and the number of social media users in the country is over 30 million (The Financial Express, 2018). With the usage of the Internet and social media, tourism organizations in Bangladesh have been branding their destinations and services in an effort to attract domestic as well as foreign tourists (Karim, 2018). Besides, travelers can also obtain necessary travel information using these social networking sites (Sultan et al., 2019). There is a popular travel group on Facebook called "Travelers of Bangladesh" wherein tourists share their experiences pertaining to several travel destinations, write travel blogs, upload video and image contents (Kamal, 2017). These types of electronic word of mouth (eWoM) contents stimulate the travel lovers of Bangladesh to visit numerous tourist attractions (Sultana & Shil,

2019). Currently, in Bangladesh, almost all the travel agents, tour operators, airlines, restaurants have their digital presence through which they have been coming up with their packages for the tourists, passengers, and restaurant visitors (Daily Sun, 2020). Numerous travel websites and mobile apps, such as Share Trip, Nijhoom Tours, BD Tours LTD, Tour BD, bdtrips.com, and Pekhom etc. are bringing comfort for the travelers. To highlight how these travel websites and apps are shaping the tourism industry, the following case focuses on "Share Trip", one of the best online travel agencies in Bangladesh, which has been offering one stop travel solution to the tourism enthusiasts in recent times.

Case of Share Trip

"With the aim of providing "Unique Travelling Experience" across different countries of the world, 'Share Trip' started its journey in Bangladesh on 30th July, 2019. It is regarded as the country's first travel app through which starting from airline tickets to hotel bookings, probable cost listings, and managing suitable transports for travelling— all can be done. At first, it began with the name Travel Booking BD. The intention was to make travel simpler for individuals and as an online travel aggregator it has been attempting to ensure simplicity since their commencement. Its' app and website were developed by a group of young people of Bangladesh. This inventive and user- friendly app offers a wide range of help relating to travelling, which is easily accessible on the Android and iOS application and site of 'ShareTrip'. The application can be utilized through digital transactions by using local credit cards. Over 100 employees work in Share Trip and they are for the most part specialists in their separate fields. They have the knowledge and competence to see every single client's prerequisites and satisfy it. Besides, being the first travel app of the country, it has also introduced reward-driven gamification. Client can play 'Spin to Win', nation's first travel reward point, and gain Trip Coins. Trip Coins can likewise be earned by booking something from its application, or by sharing the booking. Trip Coins can later be regarded to get investment funds on flight, lodging, occasion booking and the sky is the limit from there. It believes that, clients will choose them because they have brought about a revolutionary change in the way Bangladeshi travellers book travel services. With Share Trip's website and mobile application, booking someone's flight, inn or occasions become increasingly fun that one would think" (source: ShareTrip, 2020).

Besides, Bangladesh Tourism Board (BTB), the national tourism organization responsible for tourism promotion, has been promoting tourism destinations of Bangladesh with its website, social media page, and YouTube channel, though the performance of BTB is unsatisfactory (Muneem et al., 2019). Another government tourism organization Bangladesh Parjatan Corporation (BPC) has been trying to digitalize its tourism services and recently it has launched online booking system in all commercial hotels and motels affiliated with this organization with the aim of building a "Digital Bangladesh" to implement the "Vision 2021" announced by the Government of the People's Republic of Bangladesh (BPC, 2020). Also, extensive mandates for the utilization of digital technology in the tourism industry of Bangladesh are enlisted in the National Tourism Policy-2010 (Hassan & Burns, 2014).

Today, Bangladeshi airline service providers, such as Biman Bangladesh Airlines, US-Bangla Airlines, Novoair, Regent Airways, are not lagging behind in the adoption of innovative technologies. Global travel technology providers such as Amadeus provide Global Distribution System (GDS) technologies in order to book and sell e-tickets for multiple airlines (The Daily Star, 2008). Now, for the tourists or passengers, it is possible to avail the facilities of web check-in, check the live flight status via online (US-Bangla Airlines, 2020). Moreover, airline customers can make payments online through credit cards, debit cards or via local digital financial services such as bKash, Nagad, Rocket, Upay, t-cash, among others. Besides, tourists can have live chats with the airline service providers on their website.

Over the last two decades, the use of technology has been increasing in the hospitality industry undoubtedly. Bangladesh has got its first ever robot restaurant (Mexwel Robot Restaurant) in the year 2017 and took a step ahead towards AI (Rabbi, 2017). Besides, social media based food review groups such as, Food Bloggers and Food Bank, have become common sources of information for the foodies or restaurant visitors from home and abroad (The Daily Star, 2014). Talking about comfort, food lovers are living in a time when they can avail their desired products or services at our doorsteps without going outside to buy those (Islam, 2019). The Internet has been working as a savior in that respect and facilitated newer things for the comfort of their lives. According to Islam (2019), it has become so easy to get foods delivered whenever and wherever through ordering online via different online food ordering services. In Bangladesh, some of the common online food delivery platforms include FoodPanda, HungryNaki, Pathao Food, Shohoz Food, Khaas Food, Foodfex, Cookups, and Kludio, to name a few. However, considering the COVID-19 crisis, recently global online food delivery service provider Uber Eats has decided to quit its operations from Bangladesh (Islam, 2020).

Sharing accommodation platform, Airbnb, has achieved strong foothold in the hospitality industry of Bangladesh (Dhaka Tribune, 2017). Basically, it is an online market space which includes a community of people who share their rooms, homes, or space for travelers from all over the world (Guttentag, 2015; Gerdeman, 2018). Today, Airbnb allows the property owners of Bangladesh to rent out their space to the travelers who are looking for a place to live. Reports suggest that tourists from the US, the UK, Spain, Malaysia, and Germany have connected with Bangladeshi hosts using Airbnb platform and expressed their satisfactions (Dhaka Tribune, 2017). In addition, tourists are adopting app based ride sharing services, such as Uber, Pathao, and Obhai, during their visits in Bangladesh (Bappy & Haque, 2018). It has been reported that travelers from 76 countries have adopted Uber services while traveling Bangladesh in 2019 (The Daily Star, 2020b). Recently, Uber has extended its operation in Cox's Bazar which is known to be the heart of tourism in Bangladesh (Dhaka Tribune, 2020b). Besides, other cities where Uber services are available include Sylhet, Chattogram, and Dhaka. All three cities also attract significant number of tourists and visitors from home and abroad.

Although, the application of VR and AR technology in the tourism industry of Bangladesh cannot be noticed on a large scale, some of the theme parks and museums have started using these technologies at a small level. For instance, "Fantasy

Kingdom", one of most renowned theme parks of Bangladesh, has introduced innovative attractions, such as "Rock and Roll" ride and virtual reality experience "9D (VR)", through which park visitors can enjoy immersive movies and interactive games simultaneously (Daily Sun, 2019). In addition, Bangladesh National Museum has applied augmented reality technologies for enhancing visitor experience (Hassan & Ramkissoon, 2017).

As Recovery Strategies, How Can Innovative Technologies Be Applied in the Tourism and Hospitality Industry in the Post-COVID-19 Period?

Traveling can be marked as one of the main factors of spreading out the Coronavirus around the world, and therefore the travel or movement restrictions imposed by the governmental body of almost every domain across the world have become a completely new trend. As a result, the international tourism market and tourism and hospitality associated industries including accommodation, transportation, restaurant, and entertainment, etc. have witnessed a devastating hit and are still inhaling the Corona effect, although tourism is widely recognized as one of the largest and fastest-growing industries. In such a situation, it is evident that the tourism and hospitality industries require an enormous effort to shift back to their core capacities in the post-COVID-19 period since the demands, behavior, and attitude of the tourists will surely different compared to the pre-COVID-19 ones. Technovative solutions relating to health and sanitation steps, as well as the vicinity of health care services, will be the key to success in satisfying the needs of the tourists (Innovation Cloud, 2020). Lennep (2020) has also focused on the importance of technology in post-COVID-19 hospitality operations.

According to UNWTO (2020), the digital transformation of the entire tourism and hospitality value chain, contactless payment system, e-booking, distance check-in and out, software apps, automation of services, etc. will be the success criteria to safe and seamless travel in the post-COVID-19 period. Similarly, Innovation Cloud (2020) argued that the use of "technovation" such as chatbots for reservations, mobility designs to manage the flow of tourists, AI, IoT, service robotics, and gamification methods for emotional monitoring, etc. will reshape the new tourist experience during the reopening period.

Conclusion

Today, the whole world is plagued and infected by the terrible grip of coronavirus, all the economic and social activities are at a standstill, and the tourism industry is no exception. As a result, the tourism and hospitality industry, its' associated

organizations, and all the tourism dependent countries are being severely affected. The international tourism market has faced various adversities before but the impact of those was short-lived, in case of COVID-19, only time can tell about how long this virus will last. However, it is evident that tourism and its associated industries will have to go through a difficult time in the post-COVID-19 period. The post-COVID-19 plan and management which are required to overcome this disaster in the tourism and hospitality industry need to be accurately outlined now. It is already recognized by the researches that the proper applications of technology can help tourism and hospitality industry to recover quickly.

Representing the growing tourism industry nation, Bangladesh can apply the innovative technological solution mentioned in this chapter in its tourism and hospitality associated industries for quick recovery. Additionally, the country can follow the technology application strategy from other nations particularly from the international tourism destinations which have already started opening and inviting tourists. The future research should focus on the new role of the stakeholders in applying the innovative technologies in tourism and hospitality industry in the new normal life.

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Part II
The Present Scenario

Chapter 5
Application of Innovative Technologies in the Tourism and Hospitality Industry of Bangladesh: The Present Scenario

Md. Ashikur Rahman Avi, Marufa Nasrin, and Azizul Hassan

Abstract Using innovative digital devices to accomplish maximum functions associated with tourism and hospitality is the key to the application of technology in the tourism and hospitality industry. Over the last decade, technology has played a very significant role in the hospitality and tourism industry and a technological revolution has been seen. The effective application of innovative technologies enhances operational performance, improves service quality and customer experience, at the same time reduces costs, automates operational tasks, and saves time. In Bangladesh, tremendous progress has been made by using technology in several sectors in the last couple of years but the technological application in the case of the country's tourism and hospitality industry is still at the nascent level compared to the world perspective, though the phenomenon is changing. Relying on secondary works of literature, this chapter aims to present the current scenario of innovative technology applications in the tourism and hospitality industry of Bangladesh. In addressing the chapter aim a theoretical link among tourism and hospitality, innovations and technology are explored first, and then the chapter focuses on describing the importance of technology applications, their implications in the industry, and finally, it highlights on the present state of technological applications from both the global and Bangladesh perspective. The chapter concludes by generating some suggestions for the stakeholders of the tourism and hospitality industry so that they can make the best use of technology in their field.

Keywords Technology · Tourism · Hospitality · Present · Bangladesh

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Introduction

Significant innovations, including such high-speed trains, electrical energy, telephone, motor vehicle, aviation engine, television, and radio, etc., have had a prevalent effect on both the business, professional and daily life (Barwise et al., 2006). Since the development of the printing press, the Internet is considered an important innovation as well (Hoffman, 2000). A tech revolution has been seen worldwide since the introduction and implementation of Internet-based digital technologies in the product, service, and other commercial fields. In this modern technological world, the Internet is perceived as the most advanced and multi-layered tool used to exchange and disseminate information, expertise at the lowest possible cost. The vast intelligent design continued rapid development and innovation of the technology, particularly the Internet and cloud computing has changed the shape, policy, and practices of maximum industry around the world (Buhalis, 1998, 2003; Sheldon, 2004; Buhalis & Leung, 2018).

Digital Technological innovations are arising, interfering and influencing our lives in so many ways which denote that we are at the very beginning of a fourth industrial revolution, a new paradigm in which digitalization guides and affects societies, cultures, and countries in new and sometimes unpredicted ways (UNWTO, 2018). The technological revolution brought by the Internet and digital innovations have significant implications for the tourism and hospitality industry because of the positive integrated relationship among internet technology, tourism and hospitality (Buhalis & Law, 2008; Law et al., 2010; Aldebert et al., 2011; Buhalis & Jun, 2011; Navío-Marco et al., 2018). Over the 30 years, tourism and its associated industries have been closely linked to the progress of the Internet and technological innovations. The application of the internet and innovative technologies has added a new dimension to the modern hospitality industry (Sigala, 2018; Buhalis & Leung, 2018).

According to Garín-Muñoz and Pérez-Amaral's (2011) argument as an information-intensive industry, tourism can gain significant advantages from using the internet. It was suggested by Law and Jogaratnam (2005) that information and communication technology can transform the nature of tourism and hospitality offerings, businesses, and the competition, and it would be difficult for tourism and hospitality organizations to run and manage their information-intensive business if they fail to implement the right technological systems in their operational field. The advancement of digital innovative technologies has helped the global tourism industry move forward and in this present era, without the blessings of digital technology, tourism development can't be accomplished (Howlader, 2018a).

In 2018, realizing the potentialities and impact of innovative technologies on the tourism industry, the apex international organization of tourism United Nations World Tourism Organization (UNWTO) declared the world tourism day celebration theme as Tourism and The Digital Transformation (UNWTO, 2020). This chapter aims to present the extent to which Bangladesh, as a developing country, has applied innovative technologies in its tourism and hospitality industry since the announcement of UNWTO. In so doing, the chapter explores the theoretical link tourism and

hospitality, innovations and technology, discusses the importance of technology applications in the tourism and hospitality industry, and highlights on the present state of technological applications from both the global and Bangladesh perspective.

Tourism, Hospitality and Technological Innovations

For many years, as a topic of interest, the discussion on the role of innovative technology applications in the tourism and hospitality industry is growing with importance. Ratten et al. (2019) identified two reasons behind this sensational growth: "firstly, the tourism industry has been the launchpad for new technological innovations that have created new markets and products; and secondly, the tourism industry has a large number of small-sized enterprises making it competitive and thus requiring constant innovation". In this notion, the enterprises of tourism comprise accommodation service providers (hotels, motels, resorts, etc.), travel agencies and tour operators, national tourism authorities, government tourism authorities, and tourism and hospitality associated educational institutions. With the emergence of modern technology devices and innovations, the service quality in tourism has been shifted in parallel with those tourism enterprises.

The tourism and hospitality industries have accepted the changes brought by innovative technologies and widely implemented those to lower costs, improve operational efficiency and productivity and, most specifically, improve service quality and guest experience (Law et al., 2009). Technology applications usually encompass the use of internet applications and new media which are advent with the help of the internet such as social media, artificial intelligence, etc.

The Innovative Technologies Applied in the Tourism and Hospitality Industry Around the World

The integrated tourism-technology relationship has changed this sector in many ways (Tourism Review News, 2019). Not only to improve operational efficiencies but also to ensure guests' or tourists' safety and security, increase their level of experience and enhance satisfaction the innovative technologies are applied by most of the tourism and hospitality organizations across the world. Technological innovations such as the introduction of mobile or smartphone software apps, travelers' biometrics recognition, E-room booking, or car rentals with Global Positioning System (GPS), and web solutions, etc. have generated a tremendous effect on tourism and hospitality industry worldwide. The following Fig. 5.1 lists the most applied innovative technologies in the tourism and hospitality industry around the world:
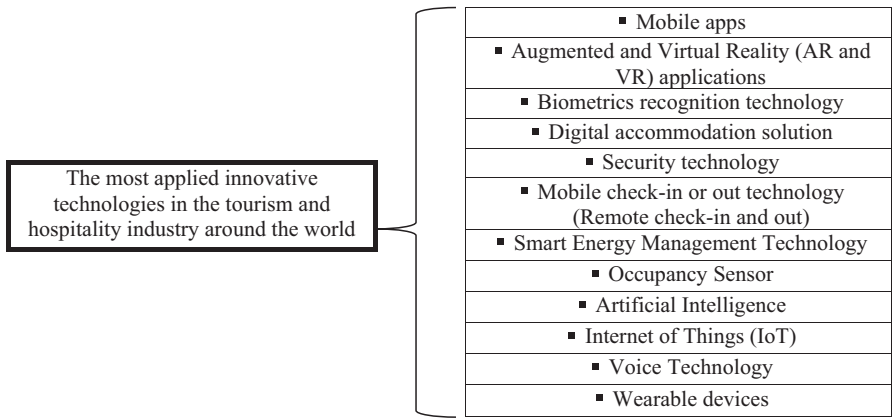
Fig. 5.1 Most applied innovative technologies in the tourism and hospitality industry worldwide. (Source: developed by the authors)

Mobile Apps

Mobile or smartphone-based software apps are one of the major segments of technological innovation that are used by most of the tourists worldwide. In 2019, a total of 204 billion mobile apps were downloaded by users around the world (Clement, 2019). Today tourists use software apps to choose a destination, collect destination information, book hotel rooms, book or buy air tickets, rent a car or taxi, shop, order foods, pay bill almost everything associated with travel and tourism.

Augmented and Virtual Reality (AR and VR) Applications

Application of Augmented Reality (AR) in the context of tourism industry examples are well found across the world (Jung et al., 2015; Hunter et al., 2015). As a part of smart tourism, AR is developed to provide information about destinations and attractions to the tourists and its application optimizes their satisfaction as well (Chung et al., 2015). The AR and VR technologies are applied in tourism and hospitality associated industries especially for content marketing and to enhance the tourists' or guests' experiences. For instance, many airline companies have already started utilizing VR innovation to display cabins to passengers in advance and thus attract them and boost ticket and additional services sales (Global Data, 2018).

Biometrics Recognition Technology

The introduction of biometric recognition technologies at the world's major airports, depending on the eyes or fingerprints, has helped make each trip incredibly easier and safer for the tourists. The Atlanta airport and the Delta airline company have already started an experimental implementation of such a project and through this technological innovation, tourists can travel without any documents as it needs biometric recognition only (Tourism Review News, 2019).

Digital Accommodation Solution

In the present world sharing economy is booming and apps based tech system like Airbnb is solving the accommodation problems for the tourists and contributing to sharing economy. By using the Airbnb platform, one can book different accommodations from the cheapest to the most luxurious ones to satisfy their need. It offers hotel rooms, resorts, motels, inns, hostels, private homes, apartment houses, and many more. In addition to these, a tourist can book the most varied experiences made available by the locals of a particular tourist zone to gather knowledge, experience, and enjoy the unique journey.

Security Technology

For assuring the safe and secure comfortable environment to the guests, nowadays most of the hospitality industries around the world are applying technological innovations in their operation area. Smart security technological innovations including mobile keys, upgraded monitoring systems, ultraviolet light technology, advanced firewalls, etc. are used most in the hospitality industry to reduce incidences of theft, assault, and data breaches involving sensitive information of the guests.

The use of Mobile keys for room entrance has added a new dimension to guests' security as this technology automatically alerts both guests and hotel management when someone tries to enter or get in the room (TOPHOTELNEWS, 2018). Most of the hotels around the world are upgrading the security monitoring system in their operation area. Many hospitality properties are expanding the number and locations of micro cameras, redesigning and maximizing the storing capacity of hardware devices, and using most advanced software that offers a low light vision to track those cameras so that face, movement, and color can be analyzed and recognized.

Even amid coronavirus health crisis across the world, to ensure safety and security to the guests' and employees, the most famous international hotel chain brand the Marriott is planning to use electrostatic sprayers to sanitize all surfaces of 7300 properties worldwide under its brand as well as the company is testing ultraviolet

light technology to sanitize keys for the property guests and devices shared by the associates (Travel and Leisure India, 2020). To combat cybercrime and protect guests' information, most of the hotels are trying to incorporate more innovative and advanced firewalls for limiting data access and securing mobile devices of the hotel employees (TOPHOTELNEWS, 2018). Similar to this, the Guy Harvey Resort of Florida has recently switched to Oracle's Opera Cloud to protect the data and information of the guests (Hertzfeld, 2020a).

Mobile Check-in or Out Technology (Remote Check-in and Out)

To provide personalized and hassle-free service to the guest, some hotels have started introducing mobile check-in and out facility. For instance, Remington Hotels is one of the largest independent hotel management companies in the United States having more than 90 hotels in the holdings has started providing the check-in via mobile phone choice to the guests, they ask for a protected digital key and proceed directly to their room on arrival (Hertzfeld, 2020b).

Smart Energy Management Technology

The application of smart energy management technology in the hospitality industry is the new trend. Using smart thermostats and occupancy sensor systems, and technologically advanced machine-learning techniques to analyze contemporary thermodynamics, local weather patterns, and peak usage loads, a smart energy management system optimizes real-time energy consumption. Attala (2019) claimed that the application of such technology reduces the hotel energy costs up to 20% and significantly increases the resale value of the property.

Occupancy Sensor

To enhance guests' experiences during their stay, the hospitality industry is using an occupancy sensor along with the guests' data. This technological innovation is used to better accommodate guests' needs and to automate guests' interactions while reducing hotel labor costs. Attala (2019) believes that applications of such technology enable hotels to estimate and personalize hospitality offerings and services relying on the guests' earlier visits and data.

Artificial Intelligence

Artificial Intelligence is behind many evolving technological applications in the tourism and hospitality industry all over the world (Global Data, 2018). Application of such technology automates operational systems, saves time, while improving service quality and organizational performance, and reducing costs. Hotel Bookings, Chatbots, Room service, and Data analysis are the key factors where the impact of artificial intelligence is significant in the tourism and hospitality industry (Bhagat, 2019).

Internet of Things (IoT)

Nowadays, IoT seems to have more potential to shape the upcoming years of the tourism and hospitality industry and its affiliated businesses. Realizing the potentials of IoT, the tourism service providers have begun to apply such innovative technology in their operational field. An example of Lufthansa, the flag carrier and largest German airline, is best suited here. This airline provides a link to its passengers on their mobile boarding pass through Lufthansa's software app. By using the link any passenger can track his/her luggage and thus Lufthansa reduces the anxiety and tension levels of the passengers related to their lost belongings.

Voice Technology

Voice-based technological advancement is another automated novelty that is implemented by many service providers of the tourism and hospitality industry since more and more guests or tourists have altered their searching style to voice interactions from typed-in search. Many famous chain hotels such as Kimpton Alexis Hotel, Westin Buffalo, and W Austin of Marriott International have started using such technology (Global Data, 2018).

Wearable Devices

Notwithstanding a slow start, wearable devices or wearable technologies are gradually being applied by most of the well-known tourism and hospitality allied businesses to offer their guests or tourists a much more customized and unique experience. For example, a wearable, customizable, Radio Frequency Identification (RFID) equipped Magic Band is installed by the Walt Disney Company, which is connected to the theme park facilities to minimize waiting times of the tourists as well as track their (tourists'/visitors') locations as well as activities. As claimed by

the Disney world, this Magic band is all in one device for the tourists through which tourists can enter the Disney parks, unlock the room of Disney Resort, and buy food and other products (Walt Disney World, 2020).

As well as the use of Smart Reserved Parking Sensor and software apps to allow guests to reserve parking places before their visit, Digital Reputation Management Technology to manage online ratings and reviews, and Loyalty-program management, etc. are reshaping the hospitality industry all over the world. In this vein, Buhalis (2019) also predicted that the tourism and its associated industries will be driven by a range of innovative technologies such as IoT, the Internet of Everything (IoE), fifth generation mobile network (5 G), RFID, wearable devises, 3D printing, Digital currency and payment system (Cryptocurrency, Blockchain), sensor and beacon infrastructures, prevalent computation, gamification as well as improved analytical capabilities supported by AI and Machine Learning (ML) over the next 75 years (2020–2095).

The Present Scenario of Innovative Technology Applications in the Tourism and Hospitality Industry of Bangladesh

Bangladesh has seen a boom in the use of the Internet riding on the back of massive growing mobile internet and the governmental initiative for digital Bangladesh (The Financial Express, 2020). This is the outcome of long term planning, continuous prioritization, and support from the governmental body. Especially the present government of this country has been prioritizing the technology sector since 2008 and has taken initiatives to build Digital Bangladesh with three stages (primary stage by 2021, secondary stage by 2030, and third phase by the year 2041) and timeframe (Halim, 2018). At present, the country has witnessed a massive boost in the number of mobile phone and internet users (The Financial Express, 2018) and tremendous progress has been made by applying technology in several sectors in the last couple of years. According to the latest statistics of Bangladesh Telecommunication Regulatory Commission (BTRC), the total number of Internet Subscribers has reached 99.984 Million at the end of February 2020.

Form the Table 5.1 it is apparent that the maximum number of internet subscribers is from the mobile internet category. So it is also evident that most of the peoples

Table 5.1 Number of internet subscribers in Bangladesh

S.L no.	Operator	Subscriber (million)
1.	Mobile internet	94.236
2.	WiMAX	0.005
3.	Internet service provider (ISP) + public switched telephone network (PSTN)	5.743
Total		99.984

(Source: BTRC, 2020)
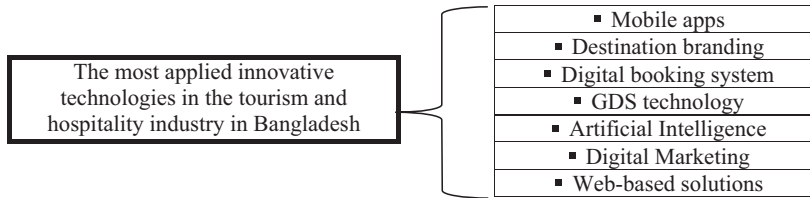
Fig. 5.2 The most applied innovative technologies in the tourism and hospitality industry in Bangladesh. (Source: developed by the authors)

of Bangladesh use the internet on their mobile or smartphone. BTRC (2020) also revealed that the total number of Mobile Phone subscribers in the country has reached 166.114 Million at the end of February 2020.

Recently in Bangladesh, the tourism and hospitality industry has witnessed a great pace of change in line with the digital technology's proper innovations. The Government of Bangladesh (GoB) has also emphasized the application of digital technology for the development and promotion of tourism in Bangladesh. Following that the country's National Tourism Policy (NTP)-2010 also offers significant instructions for the use of digital technology in Bangladesh's tourism. In this context, the GoB has also allocated and increased the budget than the previous years (Howlader, 2018a). The following Fig. 5.2 shows the most applied innovative technologies in the tourism and hospitality industry in Bangladesh:

Mobile Apps

Over the last decade, the use of mobile software applications in the tourism and hospitality segment has gained extensive popularity in Bangladesh. Now tourists are using several types of mobile software apps. Software apps like Ghurbo, ShareTrip, and Amy are used by the tourists to plan their travel; Pathao.com, Uber, Lily, Shohoz, and OBHAI are assisting tourists to meet their quick transportation needs in the major cities in Bangladesh (The Daily Star, 2019). The transportation ticketing segment has also got the touch of technological innovation. Now any tourist is buying as well as booking the ticket of bus, train, airplane, and ship by using apps like Shohoz and BDTICKETS. Even the GoB has digitalized the ticketing system by introducing two apps namely Biman Bangladesh Airlines and Rail Sheba (The Daily Star, 2012), by using these tourists are purchasing or booking air and rail tickets respectively from any corner of the country.

Moreover, tourists are also availing the opportunity to manage their accommodation by using several apps in this country. Mobile software apps like Jovago, Airbnb, Booking.com, ShareTrip, and Ghurbo are assisting tourists to fulfill their accommodation demands. Through these apps, they are managing and reserving their suitable rooms from a wide range of categories and collections such as hotels, motel, private apartments, etc.

Additionally, there are so many software applications in Bangladesh to satisfy the tourists who need food and beverage items delivered at their doorsteps. According to the report of Dhaka Tribune (2019), due to the technological innovation applied in hospitality and food sector in Bangladesh and change in lifestyle of the customers, the online food business, particularly in the country's capital and a few other cities in the country, has seen a surprising rise. Hungrynaki.com, Uber Eats, Foodpanda, Pathao Foods are the most popular software applications that are used to order foods and beverages online. By using these software tourists are making the order for foods from the most famous restaurants and hotels, paying bills, and getting the ordered items delivered at their convenient place within the shortest possible time.

In Bangladesh, the technological innovations applied in the financial segment to help the tourists for completing the safest and quickest financial transactions with the border of the country are remarkable. Mobile or smartphone software applications like Bkash, Nagad, Rocket, Sure cash, MCash, Ucash, etc. can be called as the financial assistant apps for the tourists. Through these tourists are availing the facilities to send and receive money, pay bills, mobile recharge, purchase transportation and movie tickets and many more services as well.

Nowadays tourists are also taking emergency help form the law enforcement agency of Bangladesh and emergency service providers by using mobile applications. Through BD Police Helpline apps any tourist can easily inform and ask for help from the Bangladesh police department whereas BD 999 apps can be named as a digital security assistant for the country's citizen and tourist as it is the national emergency service app that alerts Bangladesh police too in case of emergency circumstances by sending text along with the tourist's location data and a short video clip.

Apart from the above mentioned, software apps like Chaldal.com, Sheba.xyz, Bikroy.com, Rokomary.com, Aarong, AjkerDeal, Evaly, Pickaboo, Shajgoj, and Daraz, etc. cater the online shopping needs of the tourists. By these software apps tourists are receiving the advantage of shopping grocery products, electronic appliance, apparel items, books, jewelry items, etc. and getting them delivered at their doorsteps. Besides, there are some mobile software apps also such as Bioscope, Bongo, Toffee, Prothom alo, The Daily Star, Bangladesh Pratidin, Kaler Kantho, Bangla Newspapers, etc. which are fulfilling the tourists' virtual entertainment needs.

Destination Branding, Digital Booking System and Application of GDS Technology

Bangladesh Parjatan Corporation (BPC), a constitutional authoritative body under the Ministry of Civil Aviation and Tourism (MoCAT) of Bangladesh, responsible for developing the tourism industry of the country, has started collaborating with the

a2i (Access to Information) project of GoB, in many programs such tourism destination branding, awareness creation campaign, the introduction of tourism channels in YouTube, etc. (Howlader, 2018a).

According to Howlader (2018b), with the help of digital technology BPC has introduced online booking and bill payment facilities for the tourists to the hotels, motels, and other lodging services managed by BPC itself. Additionally, BPC has successfully upgraded its websites to facilitate tourists' digital services. Now any tourists visiting any destination of Bangladesh can lodge their complaints and send feedback to the highest authority of BPC from anywhere as Grievances redress system (GDS) has been installed by BPC to accept complaints from the tourists and provide compensation to them. Furthermore, to resolve any problem confronted by tourists, many digital initiatives have been put in place.

Artificial Intelligence

The use of artificial intelligence (robot) in welcoming and delivering food services to the restaurant guest is also in practice in Bangladesh. In 2017, for the first time in Bangladesh, a robot restaurant was launched at the country's capital (The Daily Star, 2017) where two robots are installed to serve food to the tourists or customers (Dhaka Tribune, 2017).

Digital Marketing

The influence of digital technology on tourism promotion is well recognized in Bangladesh (Howlader, 2018a). Most of the public and private institutions linked with the tourism and hospitality industry use digital platforms such as the internet, web site and social networking sites such as Facebook, YouTube, etc. to promote and sell their offerings. Many public and private travel companies and tour operators are using digital platforms to sell their package tours as well. With the help of digital technologies, maximum hotels in Bangladesh are communicating with the guest and potential tourists. Especially the sales and marketing teams of the five-star category hotels are depending much on the email marketing, social media marketing, post boosting for promoting their packages and offerings to reach the customers (Sarker, 2017).

Web-Based Solutions

Over the last decade, Bangladesh has become successful to present a lot of web solutions for its citizen and tourists. For online medical items shopping tourists are using websites like www.lazzpharma.com, www.pharmacy.com.bd, www.

banglameds.com.bd, www.khidmatdrug.online, www.epharma.com.bd, www.ousud.com, and www.oshudhwala.com; for grocery items shopping www.shwapno.com, www.chaldal.com, www.meenaclick.com, www.khaasfood.com, www.othoba.com, www.evaly.com.bd, www.daraz.com.bd, www.ajkerdeal.com, www.bikroy.com, www.priyoshop.com, www.e-freshstore.com, www.amaderbazarbd.com, www.deshibazar.shop, www.myorganicbd.com, and eCourier.com; for buying fresh fish and meat items www.fishmart.com.bd, www.freshfishbd.com, www.getyourfish.com, www.shaksobji.com, www.mudiman.com/shop/meat-fish, www.deshifishbd.com, www.parmeeda.com/fish, and FishDhaka.com; to shop fruits and vegetable items www.deshibazar.shop/product-category/fruits-and-vegetables, www.mudiman.com, www.mudiman.com/shop/fruits, www.farmfreshorganics.com.bd, and www.parmeeda.com.

Conclusion

From the above discussion and comparison between exhibit 5.1 and exhibit 5.2, it is evident that the application of AR and VR technology, Biometrics recognition technology, Security technology, Mobile check-in or out technology, Smart Energy Management Technology, Occupancy Sensor, IoT, Voice Technology, and Wearable devices, etc. are completely absent in the case of tourism and hospitality industry in Bangladesh. Besides, it is also apparent that the country has made a massive development in mobile apps and web-based solutions segments within a very short time. But to minimize the gap and utilize technological innovations to get the maximum result in the tourism and hospitality field, Bangladesh has huge scope. The stakeholders of the tourism and hospitality industry in Bangladesh can implement AR, VR, and IoT technology in their business for promoting their offerings and to enhance touristic or guest experience. They (stakeholders) can introduce mobile key technology, biometrics recognition technology, ultraviolet light technology, advanced firewalls, and upgraded monitoring system to ensure guest and employee safety and security. Moreover, for improving guest experience and increasing business efficiency, the stakeholders can also use mobile check-in or out technology, occupancy sensor, voice recognition technology, and wearable devices as well as smart energy management technology in tourism and hospitality operations.

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Chapter 6
Technological Innovations Application in the Tourism Industry of Bangladesh

Md Yusuf Hossein Khan, Johura Jabin Anika, and Azizul Hassan

Abstract Tourism and technology is diligently allied since the growth is recognized in both areas over the past few decades. Technology has facilitated to reduce costs, boost up the productivity, and improve services and tourist familiarity. Technology and innovation has abetted tourism industry to substitution expensive human labor with high-tech labor globally. Moreover, digital technologies can help foster an environment for new innovation and entrepreneurship in tourism industry. The aim of this paper is to see if this technological innovation application will help to propagate and breed the tourism in Bangladesh into a new dimension. The rapid development of digital technology has been expediting global tourism industry to move forward. At present, tourism development is quit impossible and unmanageable without the application of innovations and technologies. Some popular technological innovation such as artificial intelligence, augmented or virtual reality, the IoT (Internet of Things), robotics, sensor technology, block chain, user generated contains (social media) has already reformed the approach of production, distribution and consumption. Technological innovation can create a huge benefit in promoting tourism destinations in a better strategy, especially which are connected with the management problem of tourist streams and in the sustainable tourism development. This paper was based on comprehensive literature review mainly focusing on peer-reviewed journal articles, books and conference papers. Results of the research can support making the tourism industry if Bangladesh as more advanced with the application of technological innovations.

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Introduction

Digital technologies have drawn an optimistic momentum to societies and econo-
mies worldwide. For tourism and the national economy, innovation is crucial for the
success and performance of companies (Omerzel, 2015). Numerous technological
advances have linked us with a global scale, enabled the empowerment of the most
vulnerable, and transformed them into the most ardent supporters of sustainable
development. Cultural tourism has managed huge popularity over the last few
decades, owing to the acceleration of globalization and technological advance-
ments. Travel and tourism contributed US$ 8.8 trillion to the global economy in
2018, accounting for 10.4 percent of global GDP, according to the World Travel &
Tourism Council (2019). Additionally, Asia-Pacific became the fastest-growing
region in 2018 in terms of Travel & Tourism GDP. China alone accounted for a
quarter of global travel and tourism growth last year. World Economic Forum (2019)
in the Travel and Tourism Competitiveness Report 2019 presents that Asia-Pacific
recognized as the second-most competitive region in terms of Travel & Tourism.
Japan leads the 4th position in the region in overall score, while Bangladesh jumped
to 120th from 125th position. As per the report, Bangladesh had the world's greatest
percentage of improvement on its overall TTCI score.

In this new age, innovation is a critical component of economic development
and performance. The role of technology in tourism services is changing and evolv-
ing all the time. With the aid of new creative technology, tourists are more prepared
and ready to spend for their vacations. Hotels are now employing a variety of inno-
vative technologies to attract more visitors, collect data, and develop their services.
The proper application of technology are enhancing their comfort and uniqueness
of travel.

Following the AM Reports the UNWTO (2014), technological innovations have
made tourism and travel more reliable, exciting, budget friendly, accessible and
easier for tourists. The tourism sector is one of the sectors most impacted by the
Internet as well as technology. In the late 1960s and early 1970s, Global Distribution
Systems shifted to the computer based reservation system and allowed travel agents
around the world for easier access in airline flights and tour programs. Later, hotels
also followed the same platform. Moreover, popular travel aggregators like Kayak,
Skyscanner, Expedia and Google flights have not only impacted traveler's behavior
in each phase of the obtaining tourism, but also the "method invigorated a" com-
pany's and tourism destination's market strategy. Furthermore, the study examined
various aspects of tourism and its growth forecast through the UNWTO''s Tourism
towards 2030 Report (2011). This report considered social, political, economic,
environmental, and technological factors that previously influenced the trend, with
predictions about how it would shape the future. According to TripAdvisor (2014),
the Internet is the second most significant source of inspiration for leisure travelers,

following the word-of-mouth reviews of family and friends. The current storefronts are websites. As the competition is still only one click away, websites must quickly catch the virtual user's imagination while offering a smooth online experience. Since 58 percent of leisure travelers begin their planning phase with a simple Internet search, search engine optimization has become crucial. The initiation of web 2.0 is transforming the tourist's source of information search and destination miscellany process (Lo et al., 2011); search engine become one of the commonly used data collection sources while the computer become the most used appliance for both searching and booking for travel (Murphy et al., 2016).

Travel website TripAdvisor (2014) gets over 2 billion unique visitors per year and has reached their 150 million review mark in February of 2014. In the tourism industry, innovation entails the creation of radical technical solutions with the aim of implementing and promoting tourism products and services such as transportation, mobility, cultural heritage, hotels and other hospitality providers, and destination promotion (Pechlaner & Innerhofer, 2016).

According to Khatri (2019), technology is widely used in the tourism and hospitality industry to fulfil knowledge demands, research actions and results, manage activity processes, and innovations. The use of technology in advertising and marketing, customer management, value development, and competitive advantage are yet to be investigated.

The Most Recent Technological Innovations in the Global Tourism Industry

Innovations and developments continue to have an influence on the tourism industry. Computer reservation systems, global delivery systems, and the Internet, according to Mihajlović and Strugar (2015), have had significant impacts on the tactical and strategic level of tourism business. In recent years, information and communication technology (ICT) has become the backbone of numerous developments. Technological developments, according to Buhalis (2019), have the placed the entire spectrum of stakeholders together with tourism service ecosystems. Technology enhances tourism experiences by allowing tourists to co-create value at any point of their journey. A variety of disruptive technologies are also becoming the driver of tourism development example is Ambient Intelligence (AmI) Tourism. Smart ecosystems are unavoidably transforming business systems, procedures, activities, disrupting service innovation, policy, management, marketing, and productivity of all concerned stakeholders.

There are three significant examples of modernization over the past three decades: the Central Reservations System (CRS) in the 1970s; the introduction of the Global Distribution System (GDS) in the 1980s; and the World Wide Web (WWW) in the 1990s. Reservations were electronic before the Internet model, so travel agents were able to conduct various transactions on the go. Travel agents were

able to boost efficiency and achieve competitive advantages by providing real-time information to customers, giving them more options and opportunities (Khan & Hossain, 2018).

With mobile technology innovations including handheld scanners, check-in and check-out kiosks, the employees of hotels can be connected with their customers more effectively. The use of wearable devices, such as smartwatches and wearable displays will further personalize the Internet access and provide relevant information. The dynamic proliferation of mobile technologies has transformed this sector (Rodríguez et al., 2012; Jung et al., 2015).

According to the Organisation for Economic Co-operation and Development (OECD) (2018), the introduction of new technologies is causing a shift in how businesses engage with consumers in the travel and tourism industry. As a result, travel companies are implementing numerous innovations to increase operational efficiencies and fulfil consumer expectations. Virtual reality (VR) technology, for example, can supplement or replace physical journeys of certain travelers. In order to boost ticket sales, several airlines have begun to use VR technology to display traveler's cabins ahead of time. VR technology is mainly used in video games, but it might have an effect if people are willing to travel to new and exotic places without leaving the comfort of their own homes. According to Hassan and Rahimi (2016), augmented reality (AR) is an emerging and promising technology for digital tourism marketing and management. AR is a bit more advanced level of VR that combines reality with computer-simulated imageries in the real world.

Without any doubt, the tourism industry is already creating virtual assistants powered by Artificial Intelligence (AI) to assist travelers to book trips easily (Boztas, 2017). Also, big data is used to improve the efficiency and services by tracking purchasing behavior and forecasting service demands (Song & Liu, 2017). By offering real-time sources of information, big data analysis can assist in managing or resolving conflicts, spawning new scientific revolutions, advancing human health, and improving decision-making. However, as the use of big data expands, questions about privacy, inaccuracy, and abuse of such data arise. Nowadays, 4G and 5G are becoming more commonly accessible. The way travelers use their phones is likely to change drastically as they use live maps, travel guides, and to find and book hotels and restaurants (Munford, 2016). The tourism industry is increasingly reliant on technological advancements. It is evident that investments in information technology can improve hotel efficiency, minimize costs, and add value to the services and products provided to customers (Bilgihan et al., 2011).

Blockchain is a relatively new technology in this age that has a significant effect on travel. In tourism, blockchain applications may include improved and more reliable identity management, efficient communication between travelers and the full spectrum of travel service providers, from airlines to loyalty reward programs (Gjerding, 2017). Blockchain technology can benefit the travel industry with safety and protection. The tourism industry is reliant on various companies' exchanging details. For example, travel agents must provide customer information to airlines and hotels, while travelers' personal belongings are often passed between companies and monitored as well.

Rejeb and Rejeb (2019) agree that blockchain technology has tremendous potential for developing workable and creative solutions to persistent problems in tourism. Blockchain technology and its potentials can fundamentally alter how tourism develops, transact customers, and engage in emerging innovations. There are also additional fields where blockchain technology has the potential to add value to tourism that can be the subject of future study. Blockchain technology raises expectations because it enables trust-building and facilitates greater disintermediation in the tourism industry. It also enables safe travel transactions, innovative loyalty schemes, traceable tourism goods and events, and dependable online travel feedback.

Keyless entry was the first technological product and technology implemented in 2014, followed by wearables (apps for smartwatches), robots, and VR (Kazandzhieva et al., 2018). Also, energy-saving technologies such as sensor technology and IoT (Internet of Things) allow convenience while lowering overall energy consumption. Japan has already embraced the robotics trend in the service industry. In 2015, the world's first robot-run hotel was built in Japan, and it is expected that the number will double by the end of 2021 (Kikuchi, 2017). Robotics, machine learning, and AI are expected to disrupt the global labor markets within the next two decades. This will potentially eliminate up to 69 percent of current jobs in India, 47 percent in the USA, and 30 percent in the UK (Frey & Osborne, 2013) (Fig. 6.1).

Innovation and technology management are inextricably linked with high-tech and creative organizations. Today, the majority of advances occur in developed countries such as the USA, Japan, and Europe, while developing countries lag behind in terms of innovation and technology management.

Another commonly used technology is radio frequency identification (RFID), which is embedded in almost everything as credit cards, passports, transportation systems, tolls, security systems, hotel keys, airport luggage systems, pets and things (Buhalis et al., 2019). RFID that is embedded in evolving groups of sensors does not only facilitate intelligent environments based on resource and organizational efficiencies, but also supports real-time customer interaction strategies.
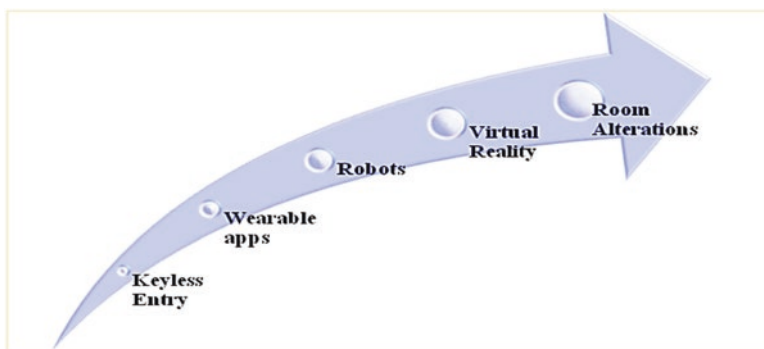
Fig. 6.1 Evolution of new technologies in hotels since 2014. (Source: Adapted from Euromonitor, 2019)

The increasing role of digital technologies and social media in tourism creates both challenges and opportunities for national and regional tourism organizations and businesses (OECD, 2018). Since visitors are becoming increasingly linked to the Internet and using tourism-related mobile applications, they are able to access real-time news, transportation, and online booking sites, as well as use social media to review and book accommodations (e.g. Airbnb, TripAdvisor). Consumer behavior and preferences in the digital economy require a significant change toward digital marketing and promotion, as well as capacity building and product creation (OECD, 2018). New technologies allow the provision of highly personalized goods and expertise to travelers, as visitors increasingly have more straightforward and comparable information at their fingertips when making choices about lodging, food, and destination visits.

Additionally, technology enables companies to communicate with their customers more effectively. Online marketing is extremely effective o increase visibility of any product by using the appropriate software to attract their target audiences. Today, effective marketing is dependent on genuine promotional activity. Social networking is particularly advantageous for promotional activities. Social networking sites such as Facebook, Instagram, and Twitter are facilitating the experience sharing of travelers.

Technological Innovation Application in the Tourism Industry of Bangladesh

Bangladesh tourism is booming. Moniruzzaman and Abedin (2015) claimed that the tourism authority should consider the successful use of technology in order to improve the Bangladeshi tourism industry. The Internet has the potential to be a vibrant and diverse communication technology that facilitates the dissemination of information both domestically and internationally.

According to the Ministry of Science and Information and Communication Technology's (2019) Information and Communication Technology (ICT) Policy for Bangladesh (2002), statements can be made as: first, information technology should be used to project tourist attractions in Bangladesh through the Internet. Second, a dependable, comprehensive, on-line information system will be built to meet the travel and lodging needs of visitors by providing instant and up-to-date information. Thirdly, partnerships with local and international tourism companies will be improved and expanded in order to facilitate online booking and ticketing for travel and accommodation, as well as booking and ticketing for arts and entertainment events and shopping.

The application of technological innovations in Bangladesh tourism is gaining traction. At the moment, the Bangladeshi government is concerned about the country's ICT growth. According to the seventh five-year plan, the government is developing a dynamic tourism industry, including ecotourism and marine cruises, in

order to create stable and sustainable blue economy. According to the World Economic Forum (2019), Bangladesh's ICT infrastructure is still very underdeveloped and underutilized. Similarly, the composition of private export earnings from services appears positive, and such earnings are yielded from three high-potential activities. Contributions from international transportation, tourism, and information and communication technology (ICT) are extremely poor (7th five years plan). Additionally, the Bangladesh government has announced to encourage foreign investment in order to import technology, and thereby improving service quality and export competitiveness. Imports of technical expertise in transportation, international shipping, information technology, and tourism will also be facilitated. Additionally, technological improvements will be made to ensure the complete safety and comfort of all travelers. Bangladesh's government recognizes ICT for a high-potential market. The 6th five years plan's focal points were for strengthening infrastructures, implementing modern innovative technologies, purchasing new aircrafts for Bangladesh's domestic and international airports, as well as installing modern navigational equipment, diverse software, and enhancing IT facilities; organizing training at all levels to enhance manpower skills and develop human capital; and providing policy support (Planning Commission, 2015).

Bangladesh Parjatan Corporation (BPC) has collaborated for numerous projects with a2i (Access to Information), including branding, public awareness campaigns, and the launch of a tourism YouTube channel. The BPC reported online facilities for visitors at all of its hotels, motels, and resorts, including online booking and payment, as well as website upgrades. Also, a Grievances Redress System (GRS) is installed to receive and resolve any complaints, grievances, disagreements, or conflicts. Now, tourists from any part of the world can lodge complaints and provide feedback to the BPC. Additionally, a digital initiative is established to address any issues that may arise from tourists (Howlader, 2018).

Social networking platforms such as Facebook, Twitter, LinkedIn, and Google Plus are now widely used in Bangladesh as forums for user-generated contents. Bhuyan and Rahman (2014) discovered that social media platforms are developed over the last few years as the most cost-effective mediums for brand communication in Bangladesh. They tend to engage consumers in novel ways and transform them into real stakeholders in the value-creation process. Tourists are enthusiastic about the ability of social media to push promotional activities and improve customer loyalty. Bangladeshi businesses are also stepping forward to capitalize the full potentials of social media platforms. The significance of social media in relation to vacationing is notable. Social media can share destination photos and tourist experiences. Tourism businesses are increasingly using social media as a marketing and communication tool (Hjalager, 2013).

Sultana (2016) discovered that almost all of Bangladesh's tourism industry's technologies (i.e. machinery and software) are imported. Thus, it is recommended that policies and programs can be implemented to enable the production of these technologies at the local level because of ample demands. It is important to deliver information to international tourists through the Internet or websites. These can help to conduct research on new tourist destinations. It is also recommended that the

country raise its market share in the global tourism sector by increasing its competitiveness. Technological advancements in the communication field, especially in the media, have potentials to facilitate cross-border cultural exchange and the dissemination of global ideology. A technique of e-marketing can be used.

The Present Context and Challenges of Technological Innovation

The convergence of digital technologies is having a troublesome effect on society in ways that would have seemed hypothetical. Though increased globalization of markets and capital movement, unique knowledge creation and technological innovation have opened new landscapes for rapid economic growth around the world, including Bangladesh, but it has numerous challenges may arise in future industrial maneuver.

While technology and innovation are synonymous with development, which is a good thing, there is also a dark side. This can include concerns about privacy; unreliable and deteriorating systems; digital segregation; knowledge and information loss; threats to languages and cultures; and even threats to human survival (Townsend, 2017).

According to Ndesaulwa and Kikula (2016), developing countries' access to technology is hampered by the lack of resources. Entrepreneurs would benefit from supports. Development strategy that optimizes with their skills, benefits them based on their talents, and helps them access their opportunities can help. Furthermore, developing countries' innovation and technology environments are by definition problematic, as they are marked by weak business models, political instability, and poor governance, a low level of education and a lack of world-class research universities, an underdeveloped and mediocre physical infrastructure, and a lack of solid technology based on qualified human resources.

The World Economic Forum (2019) defines the Fourth Industrial Revolution as the current era of rapid, overlapping, and structural changes fueled by developments in science and technology that are reshaping economies, blurring regional borders, posing regulatory challenges, and even redefining what it means to be human. The tourism industry can be harmed as a result of the adoption of innovative technologies such as AI, blockchain, IoT, and AR. While the Fourth Industrial Revolution's core is to assist in shaping the production and implementation of these new technologies for the well-being of humanity, the dubious term may fall short of the Fourth Industrial Revolution's objective. A recent report revealed that over the next two decades, approximately 53.8 lakh employment will be lost as a result of the "Fourth Industrial Revolution", in which five specialized industries—garment, food and agriculture, furniture, tourism and hospitality, and leather and footwear—will be threatened by the introduction of new technologies (The Daily Star, 2019). Similarly, Xu, David, and Kim (2018) addressed some critical obstacles that the

Fourth Industrial Revolution will face. The revolution can result in increased inequality, owing to the revolution's potentials to disrupt labor markets. As automation increasingly supplants labor across the economy, the net displacement of workers by machines may exacerbate the divide between capital and labor returns. In an age dominated by digital technology, the scarcest and the most important resource will not be ordinary labor or ordinary capital; rather, it will be those having capability of creating new ideas and inventions. In the future, talent would be more important than capital as a driver of development (Xu et al., 2018).

At the 2018 World Bank event, two influential disruptors were discussed: peer-to-peer accommodation sites (such as Airbnb) and user-generated content, which have moved control away from media corporations and hotels and into the hands of visitors (World Bank, 2018). Peer-to-peer housing is rising at a higher rate than other types of housing. Peer reviews and other user-generated contents are accelerating the growth of one of the most important sources of travel information via digital platforms. Tussyadiah and Zach (2015) discovered that peer-to-peer rental reviews place a higher premium on the tourism and hospitality industries, as well as the locality, with guests praising the natural neighborhood within walking distance of local restaurants and stores, as well as minutes by bus from downtown. Social media platforms are gaining popularity in Bangladesh as a source of user-generated content. Khan and Hossain (2018) argued that Twitter, Facebook, and other types of social media enable even small businesses to connect with potential customers and, with an effective management process, build a strong relationship for future commercial gain. Again, Tussyadiah and Zach (2015) confirmed that peer to peer rentals and hotels gain a competitive advantage by analyzing market knowledge derived from user generated content. This also confirmed the potential for applying text analytics to broader unstructured text data sets in order to obtain useful business and competitive intelligence to aid in tourism and hospitality marketing and management decisions.

Hughes and Moscardo (2019) addressed a variety of restrictions and difficulties associated with implementing emerging technology for tourist management. As tourism is a people-based service industry, automating tasks such as self-check-in and meal ordering, as well as e-booking, can eliminate the interpersonal and spontaneous aspects of travel. Dissatisfaction can be caused by a decrease in emotional or personal interest. Additionally, privacy and security concerns are a major concern for tourists nowadays, especially if information is retained indefinitely. Especially, IoT and supporting Cloud technologies were heavily discussed for gathering and storing data without the knowledge or consent of individuals. Additionally, identity safety and the possibility of network security and infiltration for criminal or terrorist purposes are concerns (Gubbi et al., 2013; Manyika et al., 2013). As technologies continue to develop and improve, there is a chance that people can substitute virtual reality experiences for traditional travel. Although this may alleviate some of the difficulties associated with handling tourists in fragile, remote, and/or overcrowded destinations, it may create new difficulties in terms of attracting adequate visitors to specific locations (Hughes & Moscardo, 2019). Similarly, visitors can become

irritated if they wish to use modern technologies and systems in locations that do not help them.

Conclusion

Although innovation and technology add value, provide comfort, and personalize the stay, they can obliterate the human relationships that develop between host and guest as a result of numerous intangible services and care. The tourism industry faces a challenge in fusing technology and human interactions to construct truly customized guest experiences. Technological advancement should be used prudently to safeguard guest satisfaction and hotel companies' competitiveness. Khatri (2019) stated that information technology is most frequently used to meet fundamental needs for information, as well as to research human behavior and success. However, very little research has been conducted on promotion and marketing techniques that incorporate advanced technologies. Additionally, although some research focused on customer service practices, relatively few discussed the industry's social and regulatory environment. Policymakers must certify a welcoming atmosphere that fosters creativity as new innovations develop, with the potential advantage of linking visitors and other institutions more effortlessly. Simultaneously, emerging developments can have unintended consequences. Additionally, policymakers must determine how to handle these rapid shifts in order to avoid unintended effects. Tourism will contribute significantly to the achievement of SDGs 8, 12, and 14, all of which are directly related to tourism. Tourism creation is supported by digital technologies in a novel way. Numerous tourism-related businesses are being established with the involvement of youth and local communities, which is growing as a result of technology. Technological progress and its implementation will aid in the eradication of poverty, the monitoring of sustainable growth, the improvement of security, the promotion of energy access and productivity, the facilitation of systemic economic change, the facilitation of social inclusion, the combating of disease, and the facilitation of access to high-quality education.

Similarly, worldwide in many hotels are gaining popularity and increasing reputation for adopting innovative technology. In Bangladesh the scenario is not very similar. As a developing country, Bangladesh is not yet ready to implement and install all the modern innovative technology in tourism sector. Limited literature found on the application of innovative technology in tourism industry which is the main constrain of this paper. Bangladesh government declared to turn the country fully digital in 2008 and so on lots of ICT based projects are running currently. In present situation it is essential to update and upgrade technology and continuous integration both internally and externally is highly needed to improve the tourism business operations. The application of appropriate innovative technology has aptitudes to bring out something unique that may change the strategy of business as well as may found a new dimension to develop tourism industry.

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Part III
Product and Service Offers

Chapter 7
Technology Application in Agri-tourism

Sadia Afrin Ananya

Abstract Agri-tourism is a form of tourism that is rapidly gaining popularity in so many countries by providing producers an immense opportunity to generate more income and an approach for direct marketing to customers. Since Bangladesh is an agricultural country with fertile land and 70% people of this country are dependent on agriculture, it has huge potential for agriculture based tourism. Agri-tourism can be a tool where selling point and comparative advantage can lie for the tourism industry in Bangladesh as it is one of the three revenue generating sectors (industry, agriculture, service). More than half of the population is engaged in agriculture, specifically in the rural area and the businesses find it difficult to market themselves to the potential visitors due to the absence of adaptation with advanced technology. The chapter deals to ascertain its current use of technology and future aptitude in agri-tourism business of Bangladesh and substantiate why agricultural attractions need a key to technology (devices, software's, android apps, etc.) for tourists so that they would be able to discover new destinations, plan their vacations, learn about food production and farming as well as for the farmers regarding modern agricultural operations.

Keywords Agri-tourism · Agriculture · Farming · Technology

Introduction

Bangladesh, a country of South Asia, is largely dependent on its agriculture as it is one of the most significant key indicators of the national income. Annual growth of GDP by agriculture and forestry sector in 2018–19 was 3.15% and by fishing in 2018–19 was 6.21% (Bangladesh Bureau of Statistics, 2019). Sustainable agriculture is possible with the application of technology as it inspires the use of new methods with greater production of crops.

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Agri-tourism is the tourism activities of the farm that supports eco-tourism and very much environment friendly. Information Communication Technology (ICT) initiates the justifiable process of utilizing natural resources and ensures economic, environmental and social benefits of the rural community. Mobile and internet technologies enable both parties including farmers and tourists, by ensuring accessible information. It works as the distributor of the product information among farmers, tourists, suppliers (Mpiti & de la Harpe, 2015). This chapter is all about the technologies that are in use of Bangladesh's agri-tourism so that it may draw the attention of all patrons to increase their contributions in the enlargement of the sector, introduce more technologies and minimize the obstacles for running an effective agri-tourism industry.

The Concept of Agri-tourism

Agri-tourism means the tourism activities in farmland or in any agricultural land where people tend to visit, gather to know about agrarian operations. Generally, agri-tourism activities are run by small scale enterprises where special self-service is included (Embacher, 1994). It links up agricultural production and tourism businesses where the farmers can enjoy both profits from selling crops and from tourism deeds like farm stay, farm tour (The National Agricultural Law Center, 2020).

Agri-tourism activities take place in a good manner in the rural zone of a country with a significant portion of the land. Although rural tourism and agri-tourism are interlinked, there is a slight difference between them. Rural tourism covers a nature based large area, countryside, rustic lifestyle, culture, food production, sightseeing holiday, rural environment, tourism and hospitality amenities (Fagioli et al., 2014; McGehee & Kim, 2004); where agri-tourism is a part of rural tourism (Wilson et al., 2001). In agri-tourism, agriculture and farming procedures are the foremost precedencies but it offers on-farm attractions and overnight lodgings (McGehee & Kim, 2004). Tourists are experiencing this as a source of excitement and learning the process of food preparation and animal rising (Wikitravel, 2020). Some examples of agri-tourism activities are cultivating crops, horticulture based actions, cutting fruits and vegetables, winery tours, fishing, dairy cattle, honey hunting, agronomy crafts, preparation of jelly and cheese, horseback riding, tour to animal husbandry, visit farmer's market, tour to agri-related museums, recreational activities, bed and breakfast, short term accommodations, etc. Likewise, agri-tourism tours are educational, recreational, participated tour in agriculture, self-harvesting (Tew & Barbieri, 2012). Instead of this, it also includes the offer of providing freshly cooked meals and agricultural farms often patronizes this.

Tourism grounded on agricultural wealth contributes to the reduction of negative impacts on the environment and increases the preservation and conservation of natural resources (Barbieri, 2013; Gold et al., 2009). Sometimes, agri-tourism is seen as a form of sustainable tourism (Barbieri, 2013), because this sways on the socio-culture, economy and environment. It creates the opportunity for the rural

community to be self-dependent, represents the culture to the travelers, preserving the landscapes and habitats in an organic way. From the economic side, farmers and their family are earning, they are contributing to the local economy. Most of the harvests and foodstuffs that are produced from agri-tourism are organic, that's why the environment is facing less pollution. Moreover, crops and livestock are protected in a sustainable manner.

An agri-tourism system model is developed by McGehee (2007), where it is demonstrated that farm families are providing crops, agriproducts and services to agritourists and DMO plays a significant role to intensify the competence of information transactions between these two parties. Furthermore, DMO can ensure the execution of more facilities for agritourists. Stakeholders must do need assessment, communicate effectively and may influence to adopt new technologies in their agricultural method. Service providers have more capability to retain new customers to turn into potential repeat customers. But within this agricultural framework, there are some obstacles like improper communication, unsustainable application of technology, lack of knowledge among farmers, etc. that inhibit the whole agri-tourism development of the zone. All parties of this agri-tourism system should be active in the dropping of these obstacles.

Phillip et al. (2010), acknowledged the typology of agri-tourism, where five types of farms are identified (see Fig. 7.1). Nonworking farm is basic rural tourism in which agricultural heritage and imagery are the priorities. Whereas, in working farm with a passive contact to agri-tourism, agricultural bond with tourism is not that much strong due to the perspective of noticing it as a source of earning. In working farm (indirect contact), tourists are attached indirectly and agricultural commodities get significances. On-site food processing is an example of this type of farm. Working farm (direct contact- staged) is that type where agritourists have a direct attachment with the activities where the relationship between agriculture and tourism have functioned at synchronized breaks. Working farm (direct contact-authentic) is the last type of agri-tourism and here agritourists involve physically in authentic farm based tasks of agri-tourism setting, donate in farm economy by establishing labor intensive nature.
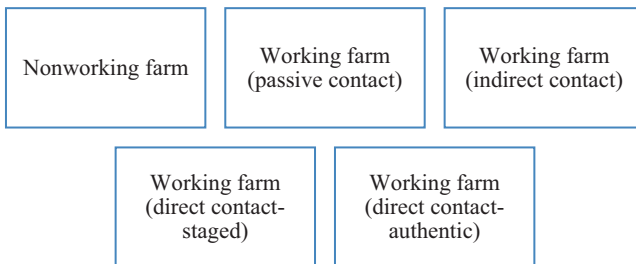
Fig. 7.1 Types of agri-tourism. (Source: Phillip et al. 2010)

Practice of Technology in Agri-tourism

Modern agriculture is more dependent on the utilization of technology than before. Agribusinesses are now relying more on different types of technology including automated irrigation, satellite photography, robot, drone, biotech and others (Wikipedia, 2020). Instead of these technologies, farmers are using electrical conductivity sensing, GPS technology, artificial intelligence, drying technology, GIS software, planting and harvesting technology, flow pumps, livestock farming, farm automation, Nitrogen modeling, RFID technology, reapers, blockchain, fertilizer drills, soil preparation. Tourism is also boosting up with the utilization of technology and innovation in its different fields on the planet. Agri-tourism is getting familiar to the tourism world and few use of technologies are perceived now. As agri-tourism mostly relies on the environment, technology should acclimate with nature. In this section, the technologies that are rapidly used in agri-tourism is defined.

Internet of Things (IoT) is the most common technologies used in agriculture nowadays as it is very much inexpensive, easy to function. This technology depends on nanotechnology, wireless networks, remote monitoring, radio frequency, sensor (Zhao et al., 2010). IoT contributes to the measurement of agriculture greenhouse production; uses agricultural sensors for enhanced product distribution; introduces smart farming by which farmers can get any solutions to their farm based queries and get several information like weather, soil, pressure, field study; improves the cattle healthiness; agricultural drones (IOT Solutions World Congress, 2020). Not only that but also the agri-tourism farms are using Web 2.0 technology and developing their websites with the good content, graphic designs, advertisements, tourists' accessibility, tour pricing, pictures and videos of the farm and contact address which is only possible due to the advancement of the internet (Havlícek et al., 2013). For young entrepreneurs, it is also recommended to go for Web Content Management (WCM), Search Engine Optimization (SEO), agri-tourism portal, non agri-tourism portal (Havlícek et al., 2009). By this, farmers are reaching to their target market and tourists are well informed with the farms before their travel so that they can plan for their future travel.

Rich et al. (2011), determined the importance of arranging webinars or online educational programs for the folks involved and interested in agri-tourism. These programs can be like meetings, video conferencing, workshops, seminar, etc. The purpose of the program is to develop the idea about how to start agri-tourism business, what locations are suitable, what are the demands of agritourists, what are the rudimentary difficulties, what strategies may solve these snags, what techniques are needed to follow, what technologies' adoption will create competitive advantage, etc. Basically, this use of technology (webinar) is appreciable because it is cost effective, time saving, source of effective communication with experts, connecting more geographically diverse audiences from the whole world.

The expansion of Information Technology (IT) opens the door for agri-tourism stakeholders to ensure their job is done by reducing the manufacturing and

communication price, having abundant information in hand (Mpiti & de la Harpe, 2015). Farmers are acquiring their knowledge from online and finding out the lacking of their previous methods. They can ensure sustainable farming as they are well-educated about the pros and cons. The interconnected communication belongs among suppliers, personnel, tourists and additional stakeholders. The farmers are now designing their plan and producing agri-tourism packages, finding out about potential customers.

Information Communication Technology (ICT) has a noteworthy role in the production of agriculture based activities (Pote, 2008). Regular and day by day innovation have taken agriculture into an established place. For example, a revolutionary invention is the blockchain technology used in agriculture and food supply chains by shortening the distribution channel with the reduction of untrusted parties (Kamilaris et al., 2019). It increases the efficiency of supply chain management, reduces waste, care environment, secure food, support farmers by mobile payments and reduced transaction fee, aware tourists by ensuring safe production of food which influences their travel decision. Another important application of technology in agriculture which may contribute to the agri-tourism field is particle films. This technology is based on Kaolin, which requires the facts of light physics, plant and insect behavior, mineral with the ultimate goal of achieving plant protection, pest control, qualified crops (Glenn & Puterka, 2005). This results in good and fresh production of food which inspires the agritourists to involve in having fresh and organic food. One of the most recognized agri-tourism technology is green waste-water technology of Norway (Paruch et al., 2019). The overall treatment of waste-water was introduced for the facilitation of the tourist zone by controlling the environmental pollution, using for the assistance of the surroundings, generating energy, using as composts. With the purpose of inaugurating the on-site water refining structure, three purification biofilter technologies are implemented including integrated infiltration, integrated trickling, separate trickling; aseptic tank; a filter bed (Paruch et al., 2019). The overall evaluation of the treatment is conducted on chemical and microbiological analyses. The complete procedure is so much ecology friendly that it ensures the desired environment for tourists to travel and earn knowledge about the farm. In addition, agrarians are applying agriculture conservation technology (Warriner & Moul, 1992) that helps farmers to increase water infiltration, upsurge the nutrient level, protect irrigation water, reduce soil erosion and pollution, save the moisturizer of the land, etc. This technology subsidizes to the whole land conservation and biodiversity management that inspires travelers to visit here for enjoying the scenic beauty, fresh air, organic food, wildlife. Precision Agriculture (PA) is a technology that shifts the use of farming technology into sustainable farming as this method observers' agricultural practices electronically and in detail (Aubert et al., 2012). Moreover, it sustainably runs farming practices and assists farmers to take decision based on science. Most of the technologies are also used in incubation, land preparation, soil conservation, agricultural training, online banking.

Rural agri-tourism farmers are mostly relying on the use of TV, radio, computers, internet, smartphones, cameras (Mpiti & de la Harpe, 2015). Nonetheless, all

pastoral societies are not well developed for supporting network infrastructure, have not well supplied internet service, farmers are educated enough and have financial insufficiency. In this case, "farmer back to farmer" (Rhoades & Booth, 1982) is introduced to solve farmers' technology related problems which include four stages including diagnosis, research, testing and adaptation, farmer evaluation. Abdullah and Samah (2013) evidenced that the adoption of technology by farmers is influenced by education. A fruitful program planning with the involvement of all stakeholders can encourage the farmers to be accustomed to innovative technologies.

Most of the agritourists are adults and visit farms in groups, with families or as an organization. They are dependent on the internet for having trustworthy information. The level of satisfaction of agritourists is determined by the attractions of the agri-tourism farm, services, facilities, personal rewards. They have an intention to satisfy the push and pull factors of motivation (Leo et al., 2020). Agritourists have demand to increase a wide range of activities in the farm and technology facilitated pre-travel, during travel and post travel. In this manner, service providers of agri-tourism business need to serve them in a suitable way to fulfill their level of expectation. But unfortunately, less attention has been paid to the agri-tourism and agritourist loyalty (Leo et al., 2020). Technological revolution reduces the distance among host to customer. Internet based research, online survey will help to identify the needs of the agritourists.

Bangladesh's Agriculture and Status of Agri-tourism

Bangladesh is an agriculture based country and it is one of the highest employment sectors (63%) and adds 19.6% to national GDP (Nations Encyclopedia, 2020). In the 2016–17 Labor Force Survey, it is seen that 24693000 people are involved in agriculture whereas in service, the number is 23711000 (Bangladesh Bureau of Statistics, 2019). Rice, wheat, jute, tea is produced a lot and conquered in the export market for this. Additionally, the country is famous for the production of different types of cereals, fibers, fruits, oilseeds, spices, pulses, sugarcane, vegetables, horticulture, irrigation, animal farming and fishing. In Table 7.1, the value of the major crops of Bangladesh is summarized where the contribution is increasing year after year.

Instead of this, animal farming generated BDTk 136,958 million, horticulture generated BDTk 8584 million and fishing produced BDTk 743580 million in the year of 2014–15 (Bangladesh Bureau of Statistics, 2019). The country is constantly in the leading list of the world in food grain production as around 70.63% land of the country are used for agricultural activities (DataBD, 2020). There are also so many institutions in Bangladesh, that are doing research and carrying out several activities to encourage the agricultural aspiration among the young generation of the country. The major institutions are- Bangladesh Agricultural University (BAU), Bangladesh Agricultural Development Corporation (BADC), Bangladesh Agricultural Research Council (BARC), Bangladesh Institute of Nuclear Agriculture,

Table 7.1 Distribution of weights of value addition of different crops in Bangladesh

Name of the Crops	2016–17		2017–18		2018–19	
	Value added[a]	Weights (%)	Value added	Weights (%)	Value added	Weights (%)
Cereals	401,514	57.64	429,051	59.67	457,262	62.80
Paddy	388,998	55.84	416,626	57.94	415,064	57.01
Vegetables	67,980	9.76	68,613	9.54	67,204	9.23
Fruits	61,290	8.80	61,369	8.54	64,683	8.88
Spices	41,406	5.94	44,310	6.16	45,918	6.31
Oilseeds	31,014	4.45	21,344	2.97	25,897	3.56
Fibers	22,990	3.30	24,768	3.44	23,907	3.28
Beverages	26,409	3.79	20,618	2.87	23,260	3.19
Pulses	9256	1.33	9477	1.32	10,030	1.38
Sugarcane	8653	1.24	8653	1.20	8961	1.23
Other Crops	950	0.14	952	0.13	994	0.14

Source: Bangladesh Bureau of Statistics 2019
[a]Represented values are in Million Taka

Bangabandhu Sheikh Mujibur Rahman Agricultural University, SAARC Agricultural Centre and many more. Along with that Ministry of Agriculture, Department of Agricultural Extension provide farming related support by forming policies, laws and regulations.

The government of Bangladesh is very much supportive to bring out groundbreaking innovations in this prosperous sector. The government encourages both public and private sector investment for the development of this most promising sector (The Financial Express, 2020). This also suggested that a change in current agricultural policy is needed with giving importance to food's nutritional value and an unrestricted environment opened for all.

Regrettably, most of the farmers of Bangladesh do not belong into well to do family. Their overall income sometimes is not sufficient enough to run a family. Due to climate change and disasters like flood, cyclone, earthquake; these families stay in catastrophe as their crops are ruined and flooded. Few CSOs and NGOs are working to upkeep the farmers' community by credit, training about the sustainable agricultural methods and precautionary measures to take during climate change, continuous study and research, techniques for food security, available technologies, agribusiness strategies. In this case, agri-tourism can be a tool of developing the condition of the farmers though all farmers of the country are not well recognized and aware of the concept of agri-tourism. This tourism reigns in the tea estates of the hilly districts of Bangladesh and earning huge profit. For example- Sylhet is famous for the production of authentic tea and is the highest exporter in the country. Agritourists visit the district's tea estates, learn about the production of different kinds of teas, engage in other recreational activities, visit museum. Accommodation, transportation facilities are very much strong over here. Lots of hotels, motel, resorts are established near the tea estates. But, in the other agricultural fields, the establishment of agri-tourism is very less or none at all. Creation of awareness is important

here to solve the problem. A SWOT analysis of Bangladesh's agri-tourism sector is presented in Fig. 7.2, so that the current situation of the sector can be noticed at a glance.

Bangladesh has the potentiality to grab the agri-tourism market as it attracts the agritourists from all over the world to visit farms, participate in the activities, have handcrafted gifts, enjoy the agricultural tasks, learn about the farming methods (Dhaka Tribune, 2020). By agri-tourism, agricultural resources can be utilized for tourism purposes. It will help to reduce poverty and apply sustainable and eco-friendly farming procedures. Agri-tourism can attract foreign and domestic travelers and offer to engage themselves in tourism and hospitality activities. In Bangladesh, most of the agritourists are independent and self-motivated. Most of the agri-tourism farms do not have proper accommodation systems. For that reason, tourists tend to stay at hotels and then visit the farm which is time consuming as well as expensive. Young and educated farmers can decorate their land by additionally providing staying opportunities near the land or may offer homestays. Government and private organizations should invest in these businesses to support their plan by founding modern transportation facilities, communication conveniences, technological facilities, supply of utilities, training regarding organic food production. They may get a return on their investment in an annual basis. So, in this way, the farmers will get a chance to earn more from different parts of their tourism activities, selling organic crops to the local and international market. With that, the agri-tourism business will help the whole tourism industry to contribute more to the GDP.

STRENGTHS	WEAKNESSES
- Natural resources, flora, fauna, animals' husbandry, fisheries - Nice weather - Additional source of income - New jobs - Community development - Increasing use of technology - Development of different dimensions of agri-tourism like agri-eco, farm based, agri-heritage based, etc.	- Slow progression - Less tourism infrastructure in rural zone - Less participation of female - Less connectivity - Lack of financial support from the stakeholders - Lack of education and awareness - Unconscious about different uses of technology
OPPORTUNITIES	THREATS
- Interest among skilled people - Building of new strategies to start agri-tourism business - More use of technology in agriculture and farming - Growing amount of governmental support - Infrastructural development for supporting tourism components - Training among farmers to learn about using technologies and modern farming - More promotion - Expansion of online marketing	- Climate change - Competition - Demand for imported products - Environmental pollution

Fig. 7.2 SWOT analysis of Bangladesh's agri-tourism. (Source: The author 2020)

Agri-tourism is also important for preserving heritage as it inspires to combine with eco-tourism and intend people to live in the natural environment. Village development is also possible with agri-tourism acts. It emboldens the participation of the local community so that, the whole community can be benefitted and more employment sources can be created from farming, agribusiness running, local guide who helps the visitors to visit the surroundings. It works as a source of creating additional income earning. Also, it creates the inquisitiveness among children, young people and adults to learn about local agriculture and their uniqueness. Lots of medias are now promoting consciousness about this combination of agriculture and tourism among Bengali people, nature friendly life style.

Technology's Usage in Agri-tourism of Bangladesh

Bangladesh as a developing country is welcoming to the new technologies in the field of agri-tourism. Although it is challenging as most of the farmers belong near the poverty line and do not cognizant enough about the use of technology, there is a possibility of improving the condition of farmers by identifying the success strategies in agri-tourism. It is more useful by applying technological tools which may work as helping hand for farmers and tourists both.

Widespread use of the internet provides flexibility in accomplishing guest-host communication. But still, most of the agri-tourism farms of Bangladesh do not have proper and updated website. Even if they have, they do not maintain it in a strong way like it is not eye-catchy, does not respond quickly. A well maintained website with visual excellence can attract potential customers, include cost effective advertising, support intensifying the market. Quality maintained websites increases sales efficiency and are very responsive to answer the queries of agritourists (Król, 2019).

Farmers of Bangladesh have access to the use of mobile phones because its price is comparatively affordable in comparison with other technological tools. Ministry of Agriculture introduces new "Agricultural Information Service (AIS)" app that suggests farmers plan and manage for agricultural based products like livestock, fisheries, etc. There is another app named "Krishikotha" which works as a monthly agricultural magazine of Bangladesh. 'BARI application' is the app where the agriculturalists can reveal their queries, know about new technologies, crop management, etc. Again, Department of Agricultural Extension introduced three apps in association with Access to Information (a2i). The first one is- "Krishaker Janala" app that suggests agronomists about a particular crop, usage pattern, give answers to their queries, identify the problems in harvesting. Secondly, "Krishaker Digital Thikana" which incorporates several technologies and information about crop productivity and crop diseases. Thirdly, "Balaynashok Nirdeshika" app which suggests farmers to identify suitable pesticides. These apps are accessible in Google Play store and are simply downloaded by the farmers of Bangladesh in their mobiles. In the future, mobile based Agricultural Market Information Service (AMIS) will be developed so that farmers will be able to gather information on agricultural market

(Islam & Grönlund, 2011). Information symmetries due to this availability of data, helping farmers to know more about market, price, crops, harvesting method, climate, insecticides, transportation and others.

In cooperation with Bangladesh Rice Research Institute, the Ministry of Agriculture introduced Bangladesh Rice Knowledge Bank that helps farmers with modern paddy cultivation (Ministry of Agriculture, 2020). Another important invention is the use of technology in floating agriculture and dug well activities. There are few submerged areas in the country that are covered with aquatic weeds and hyacinth. These zones are now piled up by making beds in a scientific way for producing various vegetables and spices in a floating manner (Ministry of Agriculture, 2020). Through dug well, the balance of nature and environment is maintained. Agricultural Information Service guided the use of e-agriculture including granular crop, vegetable crop, tuber crop, pulses, fruit and flower cultivation, fisheries, livestock, hill crops. Bangladesh Agricultural Research Institute (2020) is very active in the production of different crops by using technologies especially the production of crops, pulses, nuts, vegetables, flowers. The online reporting system is launched by the Department of Agricultural Extension that gives day to day updates about rainfall, pesticides, level of cars (Department of Agricultural Extension, 2020).

Few agri-tourism farmers are now using blockchain technology where they have a digital identity that enabled their transaction and credit taking system (The Financial Express, 2019). Agricultural practices of the country are data driven in most of the cases. These processes help farmers to take a decision and provide value added services to the tourists. Genetically Modified Organisms (GMO) are also used by Bangladeshi agriculturalists which declines the cost of food production, maintains the quality of food and nutrition. Easy access to technology, social media and information help farmers to be conscious about the current market and gain a fair price without the involvement of intermediaries (The Financial Express, 2019). The overall bonding with other agronomists, customers, tourists, traders becomes feasible by this direct way of communication. Again, modern technology introduces farm machineries which are effective for completing tasks more easily by farmers but the high costs of these machines are often is not affordable for poor farmers. The government is helping them but more support is also needed from private sectors.

Technological tools are working as a decision support system in Bangladesh (The Financial Express, 2019). IT devices and soil sensors support farmers to know about the geographical location of farms, weather reports, soil productiveness, tourists demand. The development of these devices just reduces the functional cost and increases the whole productivity for a long time. Both public and private universities, mobile companies, stakeholders and government are very much conscious in this case to form data assemble and distribution system. For instance, SmartKrishi developed by Misfit Technologies Ltd with the purpose of maintaining food security with smart devices for increasing milk productivity in the dairy cattle (Misfit Technologies, 2020).

Geographical Information Systems (GIS) is now widely used in the agriculture as well as in agri-tourism businesses of Bangladesh. Lots of products that are made from agriculture related businesses are often not sold to needy customers due to the

lack of convenient communication. GIS enables the way of vending more agritourism products, inspires travelers by giving a preview about natures, crops, wildlife, harvesting, flora, fauna, cultural heritage, geo-demographic features, tourist safety, administration tasks (Dhaka Tribune, 2020).

Traditional ways of connecting with tourists were really very expensive. Promotional efforts of big budget often go in ruin just due to its not knowing the output. It could not assure that it had reached out to their potential targeted customers. Nowadays, websites of agri-tourism farms are now promoting sustainable tourism practices which ensure more feasibility in nature. The resilience and analytics are needed to be considered now in Bangladesh.

Most of the digital apps that are available in the tourism market of Bangladesh are not quick and updated especially in the agri-tourism cases. Bangladesh needs to customize mobile apps for travelers where they can communicate directly with farmers. It often works as a profitable online marketing tool and increases the viability of the business. These applications have pictures and videos of the place which will motivate more to travel. Tourists can see the forecast of the weather before their trip plan, book their favorite agri-tourism destinations even staying at home, book travel tickets, book hotels or resorts. Moreover, it will abridge the complexity of completing transactions. The added attractions, promotional offers, tour packages are necessary to include in this.

Social media are also contributing to attracting tourists and creating enthusiastic tourist experience by agri-tourism. Few Bangladeshi farms are very active on Facebook who are creating groups for agritourists and posting status about their new services. Young generation spends a large amount of time on social media and these lucrative offers are often grabbed by them. So the role of this technology pays a lot in cost friendly tourism marketing.

Bangladesh is now applying Web 2.0 technology in a diverse field of tourism and hospitality sector for accomplishing customers' demand in priority. IT has changed their way of travel patterns where they are playing different roles such as co-producers, co-marketers, co-designers, co-distributors (Kaewkitipong & Rotchanakitumnuai, 2012). It is true even in the case of Bangladeshi agritourists. They are co-producers when they are busy in making a weblog and may adjust corrections with agri-travel package. When they are giving reviews and share experience in an online site, they are influencing other travelers and helping farms to reach more tourists which turns their role into co-marketers. These tourists are cooperating with others to design their trip through Web 2.0 technology and becoming co-designers. Even they can be intangible distributors as they are informing about their purchased deals from the farm. Web 2.0 technology definitely comforts the farmers by doing their publicity, communicational, other activities in the supply process and is used in the entire tourist life cycle.

Bangladesh has a prospectus of establishing accommodation, food and beverage, transportation, recreation facilities in agri-tourism destinations. In the cases where, farmers do not have the capability of establishing proper accommodation, they can start opening homestay like Airbnb. The recreation facilities should also consider tourists' visiting to the farmers' market, know about where they are getting food or

know about animals' husbandry, educational experience, preparation of fresh foods in the restaurants though the procedures of going food farm to table directly, singing, dancing, camping, picking fruits and vegetables. These regular offers will be updated and posted online. More infrastructure is needed in the agricultural zone but it should not hamper the agricultural production, environment, nature, soil and land.

However, Global Distribution System (GDS), Global Positioning System (GPS), Internet of Things (IoT), augmented reality; etc. are randomly used in agri-tourism. But for proper maintenance of agriculture and tourism in Bangladesh, the following suggestions are needed to be considered. First, finding out the suitable technologies for Bangladesh through research and innovation. In some cases, Bangladesh can rely on other considerable technologies from outside of the country. Second, for the promotion of agri-tourism, agricultural festivals and events are needed to be organized. Here, technology can work effectively by doing promotional jobs and let people know about it. Third, recognise the cost of technology, information and encourage the stakeholders to find out the sources of financial incentives. Fourth, agri-tourism farms can encourage both domestic and foreign investment for developing technological infrastructure. Fifth, more technological connectivity with the outer world is required. Rural community is developed by communication technology which leads to sustainable development. Sixth, the researchers need to ascertain the gap between having available technology and the barriers of having advanced technologies. Seventh, technological training should be enhanced which may increase the number of skilled manpower. Farmers' primary education regarding their agriculture field need to be ensured. Eighth, mutual understanding among farmers can initiate the use of costly technologies which is difficult to adopt by a single farmer. Ninth, websites and online marketing activities should be proactive as well as strategic so that it can meet demands and welcome new travelers for a further visit. Tenth and finally, government and private organizations should work together and embolden this new initiative by up warding new use of technologies and focusing on other tourism components' development because it can generate a huge amount of profit that may contribute to the GDP of Bangladesh.

Conclusion

As Bangladesh's economy largely relies on agriculture, agri-tourism phenomena can be the mechanism of the whole development of the community. That's why agri-tourism offerings can be designed with the innovation of technology though there are problems associated with the development of ICT in Bangladesh. This chapter highlights the picture of the current agri-tourism's progression with technology and the weak sides in adopting technology. In the final section, there are some remedy techniques that are added to identify the solutions. Technology's role in this tourism business is so important that it can work as a realistic solution by the betterment of Bangladeshi farmer's families and successfully running business. Moreover,

it will help to increase convenient tourist facilities. With proper initiative and design of the perfect agri-tourism model, it can be strappingly efficacious in the agriculture and tourism fields.

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Chapter 8
Role of Social Networking Sites on Shaping Students' Attitude Towards Ecotourism: A Study on University Students of Bangladesh

H. M. Kamrul Hassan

Abstract The purpose of this paper is to aim to identify the antecedents of attitudes and intention towards ecotourism while using social networking sites (SNSs). In the tourism industry, the importance of social networking is proliferating. However, very few studies have researched the predictors of attitude towards ecotourism in context of SNSs. This study was conducted by extending the Technology Acceptance Model (TAM) and applying it to a broad sample of university students of Bangladesh. Data were primarily collected from a survey of university students from public universities in Chattogram, the business capital of Bangladesh. Students were preliminarily selected, focusing on different profiles such as male/female, age, education level, user experience of SNSs, knowledge about ecotourism and commonly used SNSs types. SPSS and SmartPLS 2.0 software were used to analyze and test hypotheses. After applying bootstrapping technique, the authors observed that perceived trustworthiness have a robust positive effect on attitude towards ecotourism, followed by perceived ease of use and social influence. This study serves as a contribution towards the better understanding of the factors that may influence attitudes towards ecotourism. It can contribute to future research related to ecotourism.

Keywords Ecotourism · Social networking · Trustworthiness · Social influence · Ease of use

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Introduction

Tourism has long been salvation to multiple cultures around the world for being able to produce foreign currency, new profits, and employment (Choi & Sirakaya, 2005). Ecotourism has become an increasingly prominent sector in countries, mostly with abundant natural resources (UNWTO, 2018). Bangladesh is a small deltaic nation in South Asia on the valley of Bay of Bengal. While coastal destinations at beaches are the country's most famous tourist attractions, the country is blessed with the world's most extensive mangrove forests (Al Mamun et al., 2013). The country is rich with its historical background having archaeological attractions and cultural heritage. For its unique biodiversity, natural ecosystems and old heritages Bangladesh can be considered as a gold mine for ecotourism (Ahsan, 2008).

The term, social network is a relatively new term used in the field of tourism (Kasavana et al., 2010). The way consumers communicate with businesses, express their thoughts and views, and reviews have been fundamentally transformed by using social media (Mariani et al., 2019). Compared to other tourism-focused platforms, social networks may be more enticing as they are capable of attracting and shaping market curiosity through targeting the desires of customers and affecting their decisions. When technology needs less effort and works efficiency increases, people can use the system effectively in terms of speed and time.

This particular study is aimed at investigating the university students' attitudes and behavioral intention towards ecotourism in Bangladesh through using SNSs in terms of perceived usefulness, perceived ease of use, perceived trustworthiness and social influences of SNSs.

The second phase of the paper presents a review of the literature on the technology adoption model along with perceived usefulness (PUSE), perceived ease of use (PEOU), and perceived trustworthiness (PTRU) and social influence (SIN) depending on which the researcher proposed as the behavioral intention model of the university students as well as formulating the hypotheses for the associated research. In the third section, the research methodology, as well as the findings from the analysis, were discussed. The paper is concluded in the last section with reflections on the study limitations, future research guidelines and managerial implications.

Literature Review

Ecotourism

Ecotourism is viewed as a possible solution to facilitate nature conservation while fostering sustainable affluent growth (Ross & Wall, 1999). Ecotourism mark three necessary conditions are ecological training for the travelers, minimizing social and environmental consequences and regional community engagement. Lai and Nepal (2006) examined their attitudes and expectations towards four main aspects of

ecotourism: (i) preservation of natural resources; (ii) maintaining cultural tradition; (iii) sustainable growth of the community; and (iv) involvement in ecotourism inception and planning (p. 1118). Ecotourism protects the natural environment of its regions, retains social and cultural autonomy, encourages economic well-being, and embraces substantial local engagement and support itself (Ahsan, 2008). Recently, an incredible growth has been seen so far of ecotourism in theory and practice, though, the role of the ecotourism, especially in relation to tourism attitude and possible changes in behavior, is mostly unknown (Cheng et al., 2014).

Social Networking Sites (SNSs)

Social Networking Sites (SNSs) are a set of online applications that are designed to connect people around the world while helping user share and exchange information from a personal perspective (Kaplan & Haenlein, 2010). Although, the internet offers potentially unlimited information with comparatively low costs; in the tourism business, SNSs play an ever more crucial role, particularly in the quest for decision making on where to visit (Fotis et al., 2012). The study of the applications of SNSs by travelers cantered mainly on its effect on travel planning processes, and it is accepted that decision-making is heavily affected by social networks (Amaro et al., 2016). Social networks provide an essential role in providing suggestions, reducing uncertainty and making it better for people to understand what places need to visit (Gretzel & Yoo, 2008). Travelers who are more engaged with social media are more likely to post their travel experience online and adopt themselves with social media to a greater extent. In another study, the creation and usage of social network content are found comparatively higher in the youngest age ranges compared with the oldest age groups (Amaro et al., 2016).

TAM Model

The model of technology acceptance (TAM) illustrates the actions of a person towards the use of technology. It decides whether an individual should accept or deny technology-based knowledge, which can then be used to predict behavior towards technology. The model of technology acceptance (TAM) illustrates the actions of a person towards the use of technology, and it decides whether an individual should accept or deny technology-based knowledge, which can then be used to predict behavior towards technology (Anh et al., 2019; Brandon-Jones & Kauppi, 2018; Bronner & de Hoog, 2010; Gandhi & Raina, 2018; Jonsson & Myrelid, 2016; Thakur et al., 2013). The model focuses particularly upon the impact of perceived ease of use and usefulness on the attitude of using the system and the behavior of subsequent users, in which attitude comprises of an assessment by users of technologies and behavioral intent is how fast a person is to accomplish the certain type

of behavior (Davis, 1989; Mariani et al., 2019). Although in different research studies, TAM research centered on western industrialized countries; however, the TAM model has not been extensively examined in emerging developing countries (Tarhini et al., 2015). Moreover, due to its simplicity, Davis (1989) proposed that external determinants that influence the use and adoption of modern technology, particular in some technologies and environments, can be investigated along with the existing model. Therefore, this research study has introduced two distinctive variables: "perceived trustworthiness" and "social influence" – in the proposed TAM model to explain students' attitudes and intention towards ecotourism in context of SNSs.

Perceived Usefulness

Perceived usefulness is an interrelated term relating to matters such as the intensity of work, quality and performance of work, making work convenient as well as other functional aspects (Castañeda et al., 2009). Understanding of usefulness influences the behavior of social media as well as the intention of an individual to use the platform actively and implicitly (Anh et al., 2019). The perceived usefulness refers to the conviction that an individual can enhance his or her efficiency through active engagement in SNSs (Davis, 1989). Furthermore, as TAM demonstrates, perceived usefulness has a favorable and robust influence on attitude.

Hypothesis 1 *Perceived usefulness significantly influences attitude toward ecotourism while using SNSs.*

Perceived Ease of Use

Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of effort"(Davis, 1989: p. 320). In SNSs, it can be identified as being capable of handling or assessing SNS information with or without potential impact (Shittu et al., 2011). The TAM proposes that ease of use is an attitude determining factor (Davis, 1989). Therefore, if the outcomes for the ecotourism sector and the context of SNSs are combined, it can be concluded from this study that students will show a more positive attitude towards ecotourism when they perceive the SNSs as something not challenging to use:

Hypothesis 2 *Perceived ease of use significantly influences attitude toward ecotourism while using SNSs.*

Perceived Trustworthiness

Perceived trustworthiness is a distinctive feature of an individual actor engaged in the relationship (Barney & Hansen, 1994). Trustworthiness in SNSs is defined as features that cover the technical proficiency of the SNS to prevent phishing or other interception of data between itself and its members (Benson et al., 2019). Perceived trustworthiness can lessen perceived threat and bump up the eagerness of using SNSs further (Gefen, 2000). Wong et al. (2019) defined trustworthiness as the ability of the source to provide unbiased and credible information or thoughts to its recipients. Perceived trustworthiness is strongly linked to tourism in the context of social network (Ayeh, 2015; Muñoz-Leiva et al., 2012). Again, multiple empirical research from different viewpoints suggests that perceived trustworthiness is considered as a strong predictor in determining attitude while addressing SNSs (Ayeh et al., 2013a; Jin et al., 2009). Therefore, it is assumed that,

Hypothesis 3 *Perceived trustworthiness significantly influences attitude toward ecotourism while using SNSs.*

Social Influence

In the disciplines of marketing literature, the importance of social influence in forecasting behavior through SNSs has become increasingly significant (Cheung & Lee, 2010; Kim & Park, 2011; Lu & Lee, 2010). Social influence tends to play a considerable part in the behavioral intention prediction (Maldonado et al., 2009). Social influences include the significant effect of families and acquaintances, co-workers, professionals, or even inspirational figures in the media, and a generalized feeling that everybody is intended to exploit the Internet increasingly (Klobas & Clyde, 2001; Kulviwat et al., 2009). In this study, social influence is considered as a significant factor in shaping a positive attitude towards ecotourism while using SNSs.

Hypothesis 4 *Perceived social influences significantly influence attitude toward ecotourism while using SNSs.*

Attitude Towards the Behavioral Intention

Attitude is one of the most widely known variables used for attempting to anticipate individual decisions (Um & Crompton, 1990). Attitude is stated as an intrinsic cognitive inclination towards behavior, the direct outcome of a convergence of all one's salient ideas, thoughts, and perceptions towards the behavior (Pourfakhimi et al., 2019). As the intention is assessed by the positive or negative attitude of an individual towards the action, positive attitudes are likely to contribute to stronger

intentions towards the behavior (Amaro & Duarte, 2015; Ullah et al., 2017). Attitude is a subjective judgment that shows rational thinking of the desire or resentment of a person for a particular element or behavior (Saadeghvaziri et al., 2013). Different studies show that there is a significant relationship between tourism and attitude. Allen et al. (1993) denote that if economic growth is decent, the attitudes of people towards tourism will remain intense. In ecotourism, the attitude towards the main aspects of the development of ecotourism enables developers or managers to recognize how community members believe they use ecotourism to balance biodiversity and growth. Again, the most critical factor in finding out the desire of a person to perform a specific activity depends on how he/she practices such behavior. Intentions reflect the goal-based essence of individual actions, which highlight how hard individuals can strive and the extent of commitment they intend to make in order to accomplish a goal-oriented effort (Ajzen, 1998). Previous research has shown that consumers have an inclined intention to adopt a technologically advanced product if it is reviewed positively (Broman Toft et al., 2014) (Fig. 8.1).

Hypothesis 5 *Attitude towards ecotourism significantly influences behavioral intention while using SNSs.*

Methodology

Questionnaire Measurement

In this study, the proposed model and hypothesis were evaluated through a two-part questionnaire survey. The first segment is intended to gather demographic information of individuals, including gender, age, education level, study background, prior knowledge about ecotourism and experiences of using SNSs. The second segment is based on the theoretical variables discussed above to find out the influences of factors on the attitudes of university students' in Chattogram city toward ecotourism, in the context of social networking sites (SNSs) commonly used by university students.

All variables are tailored and estimated from items that have been acknowledged in previous research. Intention is assessed with a five-point semantic numerical scale, ranging from "strongly disagree" to "strongly agree". The items and their references are displayed in Table 8.1.

Data Collection and Sample

Each question in the questionnaire was systematically tested before final implementation through pilot tests after designing the data collection method, in order to ascertain whether respondents understand the context of the question and to verify whether
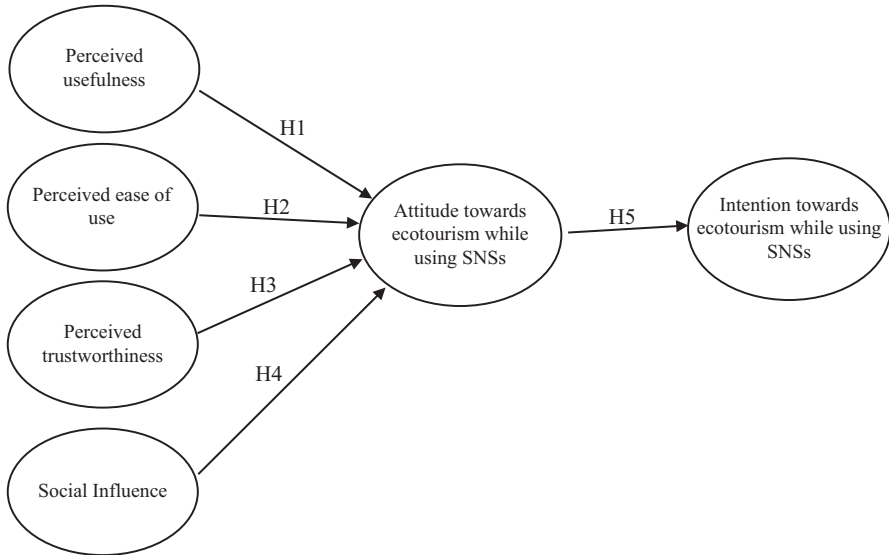
Fig. 8.1 The proposed conceptual framework. (Source: Author's own work adapted from Di Pietro et al. 2012)

the range of responses is acceptable (De Vaus, 2013). A pilot test was performed on 30 university undergraduate students, conveniently chosen from the target group.

Convenient sampling method was used in this study because of convenient access to email identity and higher response volume. The survey was conducted among university students from public universities of Chattogram, the commercial hub of Bangladesh, who had been exposed to SNSs in order to verify the study's research model. Chattogram is chosen because it represents students coming from different parts of Bangladesh, including urban, suburban and rural villages. University students are appropriate as test subjects in quantitative analysis, as they minimize the possibility of extraneous factors (e.g. age, employment, or background of study) influencing the findings (Calder et al., 1981; Samad et al., 2019). the inclusion of university students further strengthens the importance of the study as young adults demographically constitute the most engaged user segment for SNSs of all age categories (Eid & Al-Jabri, 2016; Junco, 2012; Shohrowardhy & Hassan, 2014). Before directing to the survey, the sample size should be considered. Stevens (2012) suggested that the sample size should be more than 15 times larger than the number of predictors for social science studies. As three predictors have been used in this model, which requires the sample size must be larger than 60. Moreover, in other studies, it is denoted that minimum sample size of 200 is usually required for testing the hypotheses in Structural Equation Modeling (SEM) (Hoelter, 1983; Pituch & Stevens, 2015). Again, in another study, Krejcie and Morgan (1970) suggested that

Table 8.1 Adapted measurement items with sources

Constructs		Item	Source
Perceived Usefulness (PUSE)	PUSE1	Information shared in SNSs can help to raise awareness of environmental concern regarding ecotourism practices in Bangladesh.	Adams et al. (1992), Davis (1989), Sánchez-Franco and Roldán (2005), Hu and Lai (2019) and Castañeda et al. (2009)
	PUSE2	Information and experience shared through SNSs about ecotourism in Bangladesh would be engaging and interactive.	
	PUSE3	Information shared in SNSs help me to learn something new and interesting about ecotourism practices in Bangladesh.	
	PUSE4	I hope to make a contribution to society if I know about ecotourism practices in Bangladesh through SNSs	
Perceived Ease of Use (PEOU)	PEOU1	Using SNSs to know about ecotourism is easier and useful	Davis (1989), Van der Heijden (2003), Bhattacherjee and Hikmet (2007), Adams et al. (1992), Field (2013) and Castañeda et al. (2009)
	PEOU2	Using SNSs will help me to know about ecotourism more quickly and efficiently	
	PEOU4	Using SNSs to know about ecotourism would be easy following the instructions on the Web site	
	PEOU5	I would find SNSs sites easy to use.	
Perceived Trustworthiness (PTRU)	PTRU1	SNSs provide me valuable suggestions and recommendations about ecotourism in Bangladesh	Al-Somali et al. (2009), Mariani et al. (2019), Muñoz-Leiva et al. (2012) and Corbitt et al. (2003)
	PTRU2	SNSs are reliable and dependable	
	PTRU3	SNSs provide an option that best fits my needs	
	PTRU4	SNSs are a good way to get suggestions from a neutral source	
	PTRU5	SNSs are consistent in the recommendations they provide	

Table 8.1 (continued)

Constructs		Item	Source
Social Influence (SIN)	SIN1	I will recommend others about ecotourism in Bangladesh if I get positive feedback from social network	Taylor and Todd (1995), Fishbein and Ajzen (2011) and Sarmah et al. (2018)
	SIN2	Recommendation from my online friends will motivate me to know about ecotourism in Bangladesh	
	SIN3	Social network sites which seem important to me may affect my decision to promote ecotourism in Bangladesh	
Attitude (ATT)	ATT1	I think knowing about ecotourism in Bangladesh through SNSs is possible.	Do Valle et al. (2005), Zhuang (1995), Al-Somali et al. (2009), Fishbein and Ajzen (2011) and Castañeda et al. (2009)
	ATT2	I think knowing about ecotourism in Bangladesh through SNSs is a good idea and appreciable.	
	ATT3	SNSs can help me to know about ecotourism in Bangladesh.	
	ATT4	Among various options, I would instead use SNSs to know about ecotourism in Bangladesh	
Intention (INT)	INT1	I want to know about ecotourism through the social network in the near future.	Sánchez-Franco and Roldán (2005), Hu and Lai (2019) and Leri and Theodoridis (2020)
	INT2	I am interested in using the social network to know about ecotourism next time.	
	INT3	In the future, I will make an effort to know about ecotourism practices in Bangladesh through social network	
	INT4	I will frequently use the Social network to know about ecotourism in the future	

Source: Author's own work

the sample size should be 377 if the population size is around 20,000. 393 sample size has been taken to conduct the study.

The present research uses Google Forms for data collection due to the pandemic outbreak of COVID-19. The explanation for choosing this style is because of its connection to a particular user account in Google and information is not made available for confidentiality reasons (Wiemken et al., 2018). It was undertaken to eliminate a significant probability of un-fulfilled and non-skilled persons in the selection phase and would thus lead to incomplete data analysis (Yeo et al., 2018). The survey lasted for around 45 days from March 01, 2020, to April 14, 2020. Before

conducting the survey, respondents were asked about their awareness of ecotourism and knowledge of using SNSs. Later, they were then asked to answer all the questions about the attitude towards ecotourism. After receiving the information, the data were imported into Statistical Package Social Science (SPSS) and Smart-PLS for further analysis. Initially, the data were processed by SPSS to provide descriptive statistics and frequencies for all variables.

Data Analysis and Findings

The initial conceptual structure of this study was evaluated by using the partial least squares method, which was employed through factor analysis and SEM. For analyzing data, SPSS 23 and SmartPLS 2.0 for path analysis and testing of hypotheses. The PLS-SEM is acceptable for evaluating latent variables or high-level model structured data due to its ability to tackle analytic solving issues that frequently arise in the field of social sciences namely irregular data features (e.g. non-normal data) and incredibly complex structures (Hair et al., 2010).

As shown in Table 8.2, 35.62% of the respondents were women, and 63.61% were men and rest 0.76 did not prefer to say. Age segments were classified into three segments, where 9.41% were below 20 years, 81.68% are being mainly concentrated between 20 and 25 years, and the rest 8.91% belongs to above 25 years; education was mainly concentrated on undergraduates (81.42% of the total sample), while the background of study was mostly business background (64.63% of the total sample). The experience of using SNSs site of the respondents was relatively good, with those exhibiting more than three years representing 81.42% of the total sample. Over 66.16% of the total respondents have an idea about ecotourism displayed an experience of over 1 year regarding installing and using mobile shopping platforms. Interestingly, 99.24%% of respondents have a Facebook account, while 80.66% have a WhatsApp account followed by Instagram (60.81% of the total respondents) (Table 8.2).

The model was analyzed according to three critical criteria: convergent and discriminant validity and reliability analysis (Hair et al., 2014). For the entire questionnaire, Cronbach's α value is 0.906, which suggests that the overall reliability is robust (Bagozzi & Yi, 1988). The reliability and convergent validity of the variables are checked. Cronbach's α was found more than 0.6 (Malhotra & Grover, 1998) and Composite Reliability (CR) score of each construct was found higher than 0.7, and the extracted average variance (AVE) was higher than 0.5 (Bagozzi & Yi, 1988). In Table 8.3, ranges of Cronbach's alpha (α) of the constructs are found from 0.741 to 0.821. The CR ranges from 0.837 to 0.875, both exceeding the criterion of 0.7, and thereby indicating their reliability. AVE for each construct are found moreover the commended 0.50 value varying from 0.563 to 0.633. PEOU3 and PSIN4 have been removed due to lower loading (Table 8.3).

The discriminant validity of the parameters was evaluated by determining that the square root of the AVE derived from variables was higher than the correlation

Table 8.2 Demographic attributes of the respondents

Construct	Characteristic	Frequency	Percentage	CF (%)
Age Level	Below 20 years	37	9.41	9.41
	Between 20 and 25 years	321	81.68	91.09
	Above 25 years	35	8.91	100.00
Gender	Male	250	63.61	63.61
	Female	140	35.62	99.24
	Prefer not to say	3	0.76	100.00
Education Level	Graduate level	73	18.58	18.58
	Undergraduate level	320	81.42	100.00
Background of Study	Business	254	64.63	64.63
	Non-Business	139	35.37	100.00
Knowledge about ecotourism	Yes	260	66.16	66.16
	No	59	15.01	81.17
	Maybe	74	18.83	100.00
SNSs users' experience	Below 1 year	12	3.05	3.05
	Between 1 and 3 years	61	15.52	18.58
	Between 3 and 5 years	85	21.63	40.20
	Between 5 and 7 years	120	30.53	70.74
	Above 7 years	115	29.26	100.00
Common SNSs	Facebook	390	99.24	
	WhatsApp	317	80.66	
	Instagram	239	60.81	
	LinkedIn	164	41.73	
	Twitter	67	17.05	
	Viber	43	10.94	

Source: Author's own work

found between different constructs in the model (Chen & Chen, 2017). In Table 8.4, it is found that the AVE value in the diagonal surpassed the correlations of each pair of constructs pair suggesting that the calculation has satisfactory discriminant validity. However, cross-loadings of all items have been checked, and the findings suggest that inter-loadings of the items within a construct is higher on the estimated construct than the cross-loading of individual elements, demonstrating the prejudice on the credibility of the estimated framework (Chin, 1998; Gefen & Straub, 2005).

SmartPLS 2.0 was used to evaluate the hypothesis based on on SEM. The PLS algorithm was used to examine the path relationship of each parameter and to measure the level of significance of each parameter through bootstrapping. The hypothesized relations among the constructs and the path coefficients are shown in Fig. 8.2, based on Fig. 8.1 (Hair et al., 2010). A bootstrap process with 1,000 resamples was employed. Cohen (1988) suggested the effect of the determination coefficient (R^2) as 0.02 for the small, 0.13 for the medium and 0.26 for the significant variance, respectively, showing the importance and overall impacts of the path coefficients using the bootstrapping technique and t-values measurement.

Table 8.3 Factor loading for individual items

Construct	Item	Loading	AVE	Composite reliability	Cronbach's Alpha (α)
Perceived Usefulness (PUSE)	USE1	0.7838	0.5834	0.8477	0.76
	USE2	0.7763			
	USE3	0.8245			
	USE4	0.661			
Perceived Ease of Use (PEOU)	EOU1	0.7778	0.563	0.8373	0.741
	EOU2	0.7811			
	EOU4	0.719			
	EOU5	0.7211			
Perceived Trustworthiness (PTRU)	TRU1	0.6262	0.5843	0.8746	0.8205
	TRU2	0.7894			
	TRU3	0.8029			
	TRU4	0.7906			
	TRU5	0.7978			
Social Influence (SIN)	PSIN1	0.7497	0.5659	0.7963	0.6163
	PSIN2	0.7669			
	PSIN3	0.74			
Attitude (ATT)	ATT1	0.7731	0.6162	0.8651	0.7925
	ATT2	0.8003			
	ATT3	0.8201			
	ATT4	0.7443			
Intention (INT)	INT1	0.7295	0.6327	0.873	0.8054
	INT2	0.8388			
	INT3	0.8154			
	INT4	0.7938			

Source: Author's own work

Table 8.4 Discriminant validity (Fornell and Larcker Criteria)

	PUSE	PEOU	PTRU	SIN	ATT	INT
PUSE	**0.764**					
PEOU	0.644	**0.750**				
PTRU	0.419	0.495	**0.764**			
SIN	0.452	0.513	0.386	**0.752**		
ATT	0.483	0.608	0.577	0.515	**0.785**	
INT	0.421	0.493	0.373	0.547	0.508	**0.795**

Source: Author's own work
Note: The diagonal is the square root of AVE of the latent variables and indicates the highest in any column or row
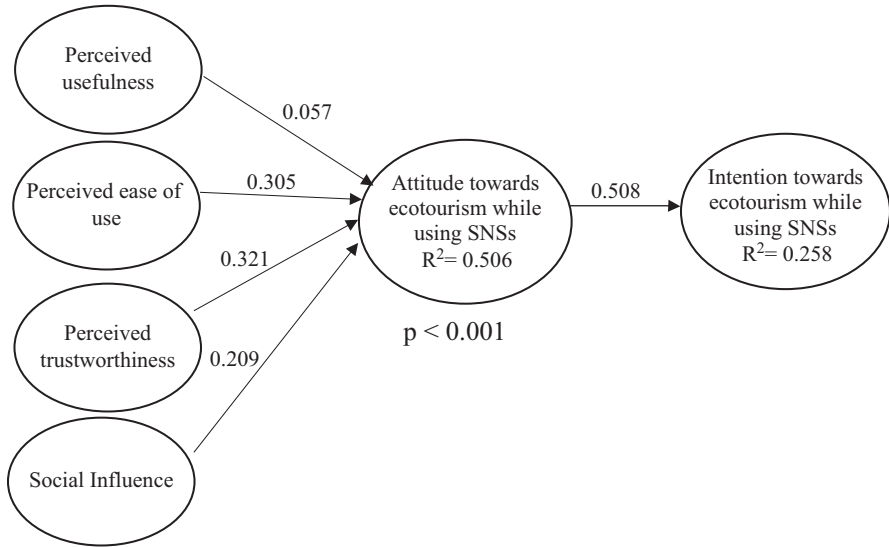
Fig. 8.2 Path coefficients result. (Source: Author's own work)

The explained variances of behavioral intention and attitude are 25.8 and 50.6%, respectively (Fig. 8.2). Attitudes significantly and positively affect behavioral intention, and it is confirmed ($\beta = 0.5136$, T value = 8. 364, $p < 0.001$), thus supporting H5. Perceived ease of use has significant effects on attitude ($\beta = 0.30$, T value = 5.101, $p < 0.01$), thus supporting H2. Again, perceived trustworthiness has significant and positive influences on attitude ($\beta = 0. 324$, T value = 6.646, $p < 0.001$); hence H3 is confirmed. Finally, social influence has a significant effect on attitude ($\beta = 0.214$, T value = 3.905, $p < 0.001$), which supports H4. However, perceived usefulness does not affect ($\beta = 0.057$, T value = 0.903, $p > 0.05$) on attitude; thus, H1 is not supported (Table 8.5).

Discussion and Analysis

From this study, it is found that perceived usefulness is not significantly related to students' attitude toward engaging with ecotourism through social media. However, the fundamental hypothesis of TAM did not endorse the negligible impact of perceived usefulness on attitude. Due to their intensive routine use of social networks, end users may not realize the usefulness of SNSs. In alignment with some of the previous research, the result indicates that perceived usefulness of social media site does not have a major effect on ecotourism mind set (Bianchi & Andrews, 2018; Venkatesh et al., 2003). Bianchi and Andrews (2018) suggested that users may not be conscious of the importance of SNSs regardless of their heavy regular usage on social media.

Table 8.5 Path coefficients and statistical significance

Hypothesis	Path analysis	Path coefficients	T Statistics	p-value	Results
H1	PUSE -> ATT	0.057	0.903	0.367	Not Supported
H2	PEOU -> ATT	0.300	5.101	0.000	Supported
H3	PTRU -> ATT	0.324	6.646	0.000	Supported
H4	SIN -> ATT	0.214	3.905	0.000	Supported
H5	ATT -> INT	0.513	8.364	0.000	Supported

Source: Author's own work

On the other hand, perceived ease of use is found significantly related to the attitudes towards ecotourism in context of SNSs. This outcome is consistent with much other research examining attitude (Jackson et al., 1997; Pai & Yeh, 2014; Suki et al., 2012). It is evident that the categories of students taking part in this research have matured up on the Internet and would become competent users. Moreover, as technologies are simpler to use and users are knowledgeable, it has been outlined that the complexity in the user interface framework, particularly with the new SNSs, is decreased (Suki et al., 2012).

In comparing path coefficients of antecedents of the attitudes toward ecotourism in context of SNSs, perceived trustworthiness emerges as the most potent predictor compared to the other predictors. The result is relevant to previous studies (Ayeh et al., 2013b; Choi & Lee, 2019). Higher trustworthiness contributes to increased dependency on others, which eventually affect the recognition of knowledge from others as indications of proof (Khandelwal et al., 2018).

Social influence has a significant impact on the attitudes of the students toward ecotourism while using SNSs. This result supports existing studies (Klobas & Clyde, 2001; Nassuora, 2013; Watjatrakul, 2014). Klobas and Clyde (2001) mentioned that social influences shape the expected usage by influencing the perceptions of current and prospective users towards the internet and their attitudes towards the effects of use. Notably, due to the introduction of Social Media as an advanced medium, the viewpoints and experiences of families, friends and others have a significant impact on students (Markus, 1987).

Relationship between students' attitudes towards intention to know about ecotourism are also significant (H5), despite showing a small effect size. It means that if perceived ease of use, trustworthiness and social influence affects positively towards SNSs, students will show their intention to know about ecotourism. These findings also support previous studies conducted by (Lu et al., 2016; Reza Jalilvand et al., 2012) in different tourism settings. Hence, the social network can, therefore, play a crucial role in recruiting and retaining new students. In reality, the information related to ecotourism in Bangladesh can be accessed for different uses through the SNSs, and travel agencies can take advantage of the chance to advertise of ecotourism destination in a creative way (i.e. personalized contests, competitions, applications and the like).

Conclusion

There is a significant growth in exposure to the usage of social networks for tourism purposes. This research aims to establish a paradigm to explain the attitudes and intentions towards ecotourism activities by analyzing the impact of social networks. A comprehensive paradigm for incorporating political, socio-economic and environmental perspectives into the growth of ecotourism and contemplating the future in order to preserve sustainable assets, and addressing equality issues to ensure universal access and usage of resources without degrading the area's ecological and cultural heritage, is necessary and should be integrated (Lai & Nepal, 2006). Moreover, social awareness needs to be created among local people to promote ecotourism through safeguarding areas which are enriched with biodiversity and cultural heritage in marginal areas of Bangladesh. In supporting this strategy, an appropriate organizational entity needs to be formed in those areas operated by related stakeholders along with local communities for developing eco-tourism. It will be active for business owners, ecotourism operators, local community and decision-makers to establish a structured ecotourism policy to consider user motives concerning the change in attitude and adjust their desired behavior across ecotourism sites. To create awareness among local people about ecotourism, students can come forward using SNSs. Through creating social awareness using SNSs about promoting ecotourism may work as crucial drivers for rural planning and biodiversity and boost local people's socio-economic conditions.

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Chapter 9
Indigenous Gastronomy in the Chittagong Hill Tracts: A Study on the Application of Information Technology for Tourism Development

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Abstract Nowadays, Information Technology is an effective tool for tourists to choose how they enjoy their pastimes in the postmodern world. Information and communication technologies provide a prospect to promote gastronomy in the tourism industry. Indigenous gastronomy is one of the major attractions to the tourists beyond globalized common cuisine. The Chittagong Hill Tracts (CHT) is the area of inhabitants of eleven indigenous communities, and characterized as the districts of cultural diversity, multi-ethnic food and beauty of natural settings in South Asia. In CHT, indigenous food culture is currently an utmost desirable cuisine to the tourists whenever they sensitize it as a "primitive" dish. Hotels, motels, and restaurants exhibit different indigenous traditional food items in their menus to draw the attention of the visitors. They distribute leaflets and hang banners by addressing traditional food lists of indigenous communities. Many tourist agencies advertise the hotels, motels and restaurants with indigenous food items to drag tourists in local and national print and electronic media. Thousands of webs, online groups, and pages are found comprising indigenous gastronomy and showing its special appearance for the national and international tourists who have a keen interest in local cuisine especially traditional indigenous culinary. Some motel and cottage owners appoint indigenous people in their offices and restaurants to get tourists' attraction. So, the chapter will travel around the application of information and communication technologies to promote the indigenous gastronomy in the CHT. Moreover, it will also illustrate how social media are playing a contributing role to the development of indigenous gastronomy in this tourist hub of Bangladesh. Methodologically, the ethnographic approaches were employed to collect data from the field.

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Introduction

Information technology is currently an effective tool for tourists to choose how they like to enjoy their time. Information and communication technologies (ICT) provide a prospect to promote gastronomy in the tourism industry. Indigenous gastronomy is one of the major attractions to the tourists beyond globalized common cuisine. Food not only provides essential energies and nutrients for the body but also relates people with other social, cultural, and political entities (Nandy, 2003). Food consumption bears a symbolic significance for the hosting country (Mak et al., 2012). Further, eating food is not the only consumption after visiting any tourist area rather food is a special feature of tourist action that pleases the five senses of the human body such as sight, smell, hearing, taste, and touch (Kivela & Crotts, 2006), which offers the tourists a sense of pleasure and experience that enriches their experience. Therefore, foods play an important role in choosing the tourist places. The Chittagong Hill Tracts (CHT) is the area inhabited by eleven indigenous communities, and characterized as the districts of cultural diversity, multi-ethnic food and beauty of natural settings in South Asia. In CHT, indigenous food culture is currently an utmost desirable cuisine to the tourists whenever they sensitize it as a "primitive" dish. Even tourists spend one-third of their expenditure on food consumption in the CHT where they are mostly attracted to the indigenous agricultural production and local cuisine.

Hotels, motels, and restaurants exhibit different indigenous traditional food items in their menus to draw attention of the visitors. They distribute leaflets and hang banners by addressing traditional food lists of indigenous communities. Many tourist agencies advertise the hotels, motels and restaurants with indigenous food items to drag tourists in local and national print and electronic media. Thousands of websites, online groups, and pages are found comprising indigenous gastronomy and showing its special appearance for the national and international tourists who have a keen interest in local cuisine especially traditional indigenous culinary (Hall & Sharples, 2003). Some motel and cottage owners appoint indigenous people in their offices and restaurants to get tourists' attention. Due to the development of virtual communication and homogenous identity of McDonald's and other imperialist cuisines (Ritzer, 2000), demand for the indigenous local cuisine and foods is created. New gastronomic attractions for the tourists become the new challenge for the mainstream food items. Though many experts assumed that McDonaldization and globalization pose menace to the local gastronomic identity and image (Torres, 2002), but the variety of the local food items and ethnic dishes play contributing

roles to face this threat. Ram (2004) believes that McDonaldization did not make any harm for local food culture rather contributed to the local gastronomic revival.

So, the chapter travels around the application of ICTs to promote indigenous gastronomy in the CHT. Moreover, it also illustrates how social media is playing contributing roles to the development of indigenous gastronomy in this tourist hub of Bangladesh.

Methodology

The study is qualitative and based on descriptive analysis. The approach of this study is likely descriptive with various aspects of the gastronomy in the context of tourism. To understand the holistic nature of indigenous gastronomy, data were collected from the three hill districts of the CHT. These districts predominantly belong to indigenous people. The study concentrated on the application of ICT for the development of tourism. Methodologically, ethnographic approaches were employed for data collection. In this study, a substantial number of informants was selected both as indigenous people and tourists. For selecting the samples, non-probability sampling and convenient sampling method were followed. Methods such as Key-Informant Interviews (KII), unstructured interviews, Focus Group Discussions (FGD), Case Study and Content Analysis were applied for data collection. In this study, participants from different cultural background defined the cuisine experience as attractive, dependable, colorful, romantic and prehistoric. Moreover, this research also states that tourists are actively seeking new experiences, have a taste for diverse and multicultural foods with 'primitive' combinations.

The CHT as a Tourism Destination

The CHT is one of the lucrative tourism spots for the local and foreign people. Over the years, especially in the winter and rain, people usually visit the CHT for leisure. Three hill districts such as Rangamati, Khagrachari, and Bandarban are distinct in their respective beauties and attractions. Rangamati is sophisticated for its eight indigenous groups. This district is although majorly lived by Chakma people with their distinct culture, food habit, language, and lifestyle. In the last few years, it has become the major tourist attraction due to the renovation of the tourist spots and improved communication. People frequently visit Rangamati for enjoying some attractive places such as Kaptai Lake, which is artificially created for producing electricity during the regime of Pakistan. Beyond, it has some beautiful tourists' attractions such as an indigenous museum, Hanging bridge, Beranna Lake, Borgang,

Shuvolong fountain, Sajek Valley, Naval picnic spot, Renna Tugun, Kaptai national forest, Karnaphuli hydraulic project, Kaptai dam, Mejang Restaurant, Birsrestha Abdur Rouf memorial, Karnaphuli paper mill, Betbunia satellite station, Panorama Jhum restaurant, Peda Ting Restaurant, Tuktuk Eco Village, Banasri Tourist Complex, Aronnok Resort, Happy Island, Pollwell Park, DC Banglo and Lake view Island, etc. Nowadays, Sajek Valley is popular in this area as it combines artistic sceneries, cottages and restaurants, and other facilities. Thousands of tourists visit the valley every year to get entertainment with rain and clouds. The valley is surrounded by indigenous villages and therefore, indigenous foods are great attractions to tourists. Commutation and security are also ensured effectively. Beyond, Kaptai Lake has its special features that attract tourists and visitors to travel the whole lake with boats either by individual drive or by the engine, and accordingly, the whole devious lake is succinct with green trees and grassy terrains. Some people wish to watch the Hanging bridge and numerous fountains in Rangamati while roaming around Rangamati. Other spots also have amused beauties and arts.

In the CHT, Khagrachari is distinguished for its natural and artificial tourist spots and some hills have become the remark of this district. It is also full of green and natural resources which get many indigenous communities in the area. Some of the celebrated spots are Alutila Terang Toikai Risang fountain, Alutila Terang Chumui, Alutila cave and spot zone, Zila Horticulture park, Matai Pukur or God Pond, Toiduchora Fountain, Mayabini Lake, Shantipur Aronno Pukur, Dighinala Dighi and so on. It seems that Alutila cave is the first tourist spot in Khagrachari which is still the main attraction. In this area, most of the spots' names are related to the indigenous language. For example, Terang Toikaly Rechang Fountain is a combination of two indigenous languages where the first two words are borrowed from Tripura and Marma. There are many facilities for the tourists in surrounding areas. Roads and communication are updated and hotels and restaurants are also decorated with modern arrangements.

The next, Bandarban is probably the most lucrative spots for the tourists which is full of springs and high hills. In the rainy and winter season, people can enjoy fogs and breeze in this area which make these spots special and valuable. Bandarban is the south-eastern district of Bangladesh and it is the lowest densed area in Bangladesh. The famous tourist spots in this area are Neelgiri, Shawrna Mondir (Golden Temple), Meghla, Shoila Propat, Neelachal, Milanchori, Chimbuk, Shango River, Tajing Dong, Keukara Dong etc. Many other amazing spots make Bandarban engaging for people and tourists. Tourists cannot be capable to visit all the places together in Bandarban as these are situated in distant areas. Security and protection are also remarkable issues. Those who visit Bandarban with families like to stay around the city and visit the nearest places. Neelgiri is the highest peak of Bandarban which is around 3000 feet tall. Further, many indigenous groups, especially Mru community people live in surrounding Neelgiri hill. It's fascinating that in the rainy and winter seasons, tourists can watch and enjoy the sunrise and sunset from this hill. Another alluring spot in Bandarban is the Golden Temple of Buddha which is colored golden and a piece of real gold sets on the peak of the temple. Although the temple is a little bit difficult to ride by the old and children, people never want to

miss the beauty of the temple. The 'God's Pool' on the hill is amazing to enjoy. It is a pond on the hill with water. The beauty of Bandarban is that indigenous women work in all the shops, stalls, hotels, and restaurants and it makes Bandarban exceptional than others.

Factors Influencing Tourism in the CHT

In Bangladesh, the CHT is different with many features such as different people, different cultures, different food habits, different locations, and beauty. It has almost no similarities with the Bengali mainstream land area and people. So, generally, people like to visit the CHT to have some leisure time. In this way, tourists do not visit solely to see the beautiful locations. Many indigenous food items are offered in hotels and restaurants in the CHT. These are not available in any other corner of the world. Now-a-days, tourists want to taste different cuisine, especially local and indigenous items where they pay a visit. Likewise, tourists who visit the CHT prefer indigenous food items along with modern meals and foods. In Rangamati, restaurant owners provide local indigenous food to tourists and the demands are growing. Many hotels and restaurants appoint indigenous boys and girls to impress tourists. To take food in any restaurant, tourists prioritize cleanliness, healthy food, local food, and safety. Some accept indigenous foods as fashion and some just visit the CHT for having a look on them. It must be saying that indigenous foods are not only delicious but also contain healthy ingredients. Indigenous items are more natural and have limited spice which composed of natural taste with safety.

In the CHT, pig's meat is more popular among all the indigenous communities. It turns into a public demand in tourist spots though some Muslims ignore this meat. Khagrachari hotel and restaurant owners announce special discount for the tourists on the indigenous food items as it becomes the market demand. In the CHT, foods are very healthy and safe as there is no mixing of formalin and chemicals. The restaurants and hotels collect raw materials of the food items from the indigenous sources. Local meats are also available in the hotels at a higher price. Tourists are fond of Khagrachari food items for freshness, traditionality, and formalin-free character. However, Bandarban is the most desirable place for tourists as it has many spots together. Besides, common Bengali and modern foods, indigenous items are popular among the tourists especially green vegetables, local fish, and chicken. People choose Bandarban due to its natural attraction and seasonal beauty.

Multi-ethnic Food Items

Modernity has its influence all over the world. The CHT has changed a lot due to modern facilities and technologies. Once upon a time, it was very difficult to enter the CHT (Barua, 2001) and tourism was not popularized to the people. It was the

place of fear, tear, and conflict among the multiple stakeholders. After the "Peace accord" in 1997, tourism in the CHT opens a new window for the common people. In this process, many Bengali businessmen started their business in the CHT. Modern hotels, motels, and cottages were inaugurated with the help of local administration. Therefore, the CHT becomes the business hub and commercial attraction to national and international food sellers. Both local and national businessmen are maintaining their activity. Tourists can enjoy both indigenous and modern food together. Many indigenous hotels and restaurants sell their special indigenous food items. Normal restaurants also sell indigenous foods. In Rangamati, the indigenous common foods that are available in the market are "Jerang" (cooked in the bamboo pipe), "Hebang" (cooked in banana leaves), "Banshkorol", Snail, frog, crab, "Tara" (Chakma language), pig's meat, deer meat, dry fish, varied vegetables, banana tree, lake fish, etc. The main choices of tourists are "Hebang" and "Jerang". In the CHT, the majority of the people are Chakma although Marma and Tripura also live there. Hence, most of the food items come from the Chakma community and some other items are from Marma and Tripura. The restaurant owners admitted that there is a change of taste of the indigenous food items when cooked for commercial purposes. What indigenous people use in their house, is lesser spice and healthy and on the other hand, restaurants use more spices to increase taste which attract tourists. On the contrary, some different items are found in Khagrachari though lots of similarities exist between the districts. The main food items that are available for tourists from indigenous communities are the bamboo chicken, bamboo fish, bamboo shoot, mushroom, "Kebang", "Appreng", "Gudak", "Chakhai", fried-fish mash, "Thankuni" mash, bamboo shoot fry, "Marfa" salad, etc. These indigenous food items are available in both indigenous and common restaurants.

In Khagrachari, the food items are mainly collected from Marma and Tripura communities though there are many Chakmas live there. These food items are not from any specific indigenous community rather they are supplied from all of the communities and the names are changed after changing community. For example, the same boiled food is "Appreng" to Marma and "Rojak" to Tripura. Yet, the most common indigenous items among Chakma, Tripura, and Marma are bamboo chicken, bamboo fish, bamboo shoot, mushroom, dry-fish fry, etc. Bandarban looks different compared to Rangamati and Khagrachari. There are not many popular indigenous food items like Rangamati and Khagrachari. Bandarban is the habitat of Marma community and they are not such developed as Chakma and Tripura. Very few Marma restaurants are found in Bandarban. Still, many of the indigenous items are discovered in the restaurants. Some of the items are "Tojah", local pig's meat, "Appreng", "Bunlesh hilsa", river crab, chicken, "Bashkoral" cook, dry-fish vegetable, Chicken curry, bamboo chicken, Sango river fish and "Pahari" vegetable, etc. People search the halal food in this area. So, the restaurant owners present foods from the indigenous group that are common among tourists such as bamboo chicken, bamboo fish, bamboo vegetable etc.

When Gastronomy Becomes the Identity

In the CHT, it is evident that indigenous food items have become a symbol of identity and dignity for the indigenous people as they become popular among the tourists. Indigenous people in the CHT are genuinely sophisticated with their cultures, food habits, dress codes, languages, religions and customs. Tourists visiting the CHT may forget to taste international cuisine but they hardly can forget the flavor indigenous foods. Even many tourists visit the CHT only to taste indigenous foods. Nowadays, these food items are not only representing the indigenous communities of the CHT, but becoming popular in the larger cities of Bangladesh. People usually like to consume these items of indigenous origin and these items hold indigenous identity. Very specifically, some of the popular indigenous food items like bamboo chicken, bamboo fish, bamboo vegetable and local wine, etc. represent the indigenous identity before the tourists.

Bandarban district official database shows that more than 58 hotels and 47 restaurants are operating in this small city that was not possible even ten years ago (Bangladesh Bureau of Statistics, 2020). Furthermore, many indigenous people work in hotels and restaurants permanently or temporarily and get economic benefits in multiple ways. Some have opened shops and showrooms of indigenous products in the tourist spots to sell the traditional items. Many indigenous young male and female sell their assorted products as mobile vendors such as cakes, crafts, clothes, toys, dolls, and so on. Also, many indigenous people sit in a place to sell 'Pahari' fruits to the tourists. Sometimes fruits are served by mixing indigenous spices which add taste, flavor and aroma. Another impressive feature is the time when tourists intend to visit distant places without accommodation and food, indigenous people commonly provide them accommodation and food facilities in exchange of money. Tourists can stay at indigenous houses along with food services where they spend immaculately beautiful moments with nature, hills, forests, and fountains.

In general, indigenous people are treated differently by the mainstream Bengalis mainly for their individual ways of life and livelihoods. Such distinctions make the tourists attracted to the indigenous people, culture, dress, foods, and so on. Whenever tourists come to visit the CHT to enjoy natural beauties, fountains, lakes, and hills, they want a variety in their cuisine besides the national and international food items.

With the popularity of indigenous cuisine, socio-economic changes are happening in indigenous communities. They tend to get new sources of income and work. By capitalizing this indigenous cuisine, many people especially ethnic youths have started small-scale businesses in tourist spots and some sell indigenous products such as foods, clothes, and crafts to the tourists. Tourists usually prefer ethnic items though sometimes these are not sustainable or modern but has exceptional qualities.

Factually, tourism and development in the CHT promote indigenous products and items among tourists which create employment for many indigenous male and female. Notably, the CHT has become the supreme tourist attraction in Bangladesh and thousands of tourists come to visit every year from almost all over the world.

But this cuisine comes closer to the tourists with the help of ICT. Tourists get updated information and data about the local cuisine whenever they visit any spot. Thus, tourists ask restaurant owners about the indigenous food items. Eventually, hotels and restaurants started to store and exhibit indigenous food items on their showcases. In this process, indigenous cuisine has become a part and parcel for the tourists. Also, this cuisine turns into the identity of indigenous people. This identity contains indigenous values, culture, customs, practices, and traditions.

Therefore, indigenous food items that once met demands of only a particular indigenous community or group, become the appetite suppression for thousands of tourists. The journey of indigenous cuisine was not so easy among many luxurious Bengali and international food items. The government agencies are also having efforts for improved communication, developed infrastructure, and increased use of social media and ICT etc. Hence, steadily but surely, the CHT is going to be a famous tourist destination and commercial hub in coming years.

Technological Application

Technology is the root of social change in the twenty-first century. Technology has reached every corner of the world irrespective of culture, creed, caste, and religion. The world without technological items is not only difficult but also impossible. The tourism industry in Bangladesh is also evolved with the development of technology. Bangladesh is now experiencing the fifth generations of the Internet speed and it plays a great role in the development of tourism (The Daily Star, 2018). ICT centers are inaugurated in districts of Bangladesh. In Rangamati, hotels are booked online from all over the world and restaurants also accept online food orders from customers. Although they mainly use Facebook as a networking site, many of the hotels found in this area use websites and other social media. The hotels and restaurants maintain their Facebook pages and personal accounts where they update regular cuisines, schedules, and orders. The owners believe that tourists are their main network because many people visit Rangamati after hearing from friends and families.

Some restaurants sometimes maintain less familiar social media such as Instagram, Twitter, and WhatsApp for publicity and open pages and groups. They include food items, prices, features, location, facilities, and so on and details about how to reach Rangamati. Both the Bengali and the English languages are used to comprehend readers. Though many hotels and restaurants do not have websites, they maintain society or association. They use websites and all hotels and restaurants have links.

Khagrachari hotel and restaurant owners do the same as Rangamati. Indigenous owners do not campaign online rather they make it more offline. But the common restaurants who sell indigenous items use social media to provide an update to tourists. They write online about prices, food items, orders, and more especially offers and discounts. In Bandarban, most of the indigenous owners do not make any campaign for their restaurants through mainstream online facilities. They make a

campaign about their products and prices along with offers alike Rangamati and Khagrachari. Some hotels and restaurants upload different indoor and outdoor and food images to attract tourists. They also describe item characteristics and qualities with price and discounts. In the CHT, mainstream hotels, restaurants, and resorts are more interested in technology and campaign. The online campaign is mostly conducted with mobile, laptop, tablet, and desktop computer. They also use local and national electronic and print media to circulate food items. They use mobile networks such as Robi and Wi-Fi stream to do their circulation. Many restaurants are connected to food suppliers such as food panda and Pathao to spread the campaign. In this joint venture, they use their institution's nameplate, visiting cards, food menus, offers, and discounts. They use the English language online to attract foreign tourists. On the other side, the Bengali is used in offline, print, and electronic media to capture the national audience. Indigenous people said that due to technological array, indigenous food which was once consumed only by indigenous people now becomes one of the attractions in the CHT for tourists. One section of the tourists visits the CHT to have indigenous foods and cuisine. Restaurant owners confirmed that 80%–90% of bookings and sales occurs online and customers book their place in advance. Since all the audiences use mobile and devices with the Internet, it becomes easier to communicate with tourists by technological devices.

Conclusion

This study descriptively reveals the interests of tourists' visit and how they chose a destination related to cuisine experience. It identifies the salient factors that influence tourists' visit intentions in the context of culture and cuisine experience. The finding of this study clearly indicates that people find gastronomy of the CHT to be a rather dominant determinant in tourism destinations. A travel destination as the CHT with satisfactory gastronomic experience is found enough to brand the entire travel "satisfactory". It also indicates that gastronomy is the sole reason to choose the specific traveling destination in the CHT. Gastronomy and cultural diversity of the CHT contribute, influence and motivate tourists' experiences. However, the gastronomy of the CHT is yet an unexplored and less exposed business for international tourists. It is a prerequisite to understand and meet the needs and wants of tourists in the context of gastronomic experiences.The local and national authority can play vital roles to make these areas more comfortable and safer for the tourists. The roads and vehicles could be updated to ease the movement of tourists along with secure Internet. To fill the desire of the tourists and to connect the indigenous gastronomy with international cuisine, communication channels should be renovated together with the application of ICT for the development of tourism in Bangladesh.

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Chapter 10
Technology Supported Tourism: A Study on the Buddhist Vihara at Paharpur in Bangladesh

S. A. M. Ziaul Islam and S. M. Sadat al Sajib

Abstract The aim of this study is to understand the engagement of a possible technology application in a religiously important tourist site in Bangladesh. In this research, Augmented Reality (AR) stays as the example of technology and the Buddhist Vihara at Paharpur World Heritage Site (WHS) as the site. This study then outlines sustainability issues generated from AR application and tourism on the Buddhist culture attached to this site. This study employed in-depth interviews for data collection in line with reviewing the existing literatures. Findings indicate that the tourists visiting this religiously important destination are typically keener to know the site. Interpretation of this site's cultural background and richness followed by the local community engagements can help. Creating story for them can possibly turn a destination get a better position over its competitors and to narrate this within the audience through almost all marketing communications and channels. The Buddhist Vihara at Paharpur of Bangladesh is rather a sacred destination for Buddhism that can be interpreted with AR. Stakeholders, government officials and the local community representations can benefit. The study suggests that sustainability issues on the Buddhist culture from AR interpretation can be minimized with effective engagement of the local communities in the process.

Keywords Tourism · Religion · Culture · Augmented reality · Sustainability · The Buddhist Vihara at Paharpur

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Introduction

Somapura Mahavihara started its journey as a residential university about 1200 years ago. At that time there was no other large structure in the south of the Himalayas. World-renowned scholars like Bodhibhadra, Kalmahapada and Atish Dipankar were the principals of this monastery (Roy, 1959: p.605). Buddhist students and scholars from home and abroad came to study at this monastery (Kristi, 1987: pp.14–18). In Paharpur, various structures have been built over the ages; various stories of legends have been created. Paharpur is an important place in ancient history with monuments of different ideologies on its chest. In recognition of this, United Nations Educational, Scientific and Cultural Organization (UNESCO) have declared Paharpur Buddhist Monastery as a World Heritage Site. However, the name changed, nationally and internationally, "Somapura MahaVihara" became Paharpur Buddhist Vihara. Present Paharpur (GPS 250 01 '864" N, Lat 880 58 '699" E, Long) is a union and a small village in Badalgachhi Upazila of Naogaon district. The distance from Naogaon city to historic Paharpur is 27 km, on the other hand it is only 5 km west from Jamalganj railway station in Joypurhat district (Department of Archaeology, 2015). This archeological site belongs to the floodplain of North Bengal, a low-lying area called Barindra of the Pleistocene period. Due to the presence of iron in the soil, the soil here is reddish, although at present the soil is covered with sediment in most places (Alam et al., 2009: p.504). The ruins of an ancient temple in the middle of a vast continuous plain (about 30.3 m above the surrounding land) naturally make it attractive. The name Paharpur originates from the location of this ruin, locally known as "Gopal Chitaar Pahar" (Hossain & Rahman, 2016: p.10). Paharpur Buddhist monastery, an important monument in the history of Bangladesh, which is recognized as a world heritage site, has a great potential for tourism in the north. But due to lack of proper conservation, modernization of Vihara, lack of knowledge in technology-based tourism and lack of global promotion, it could not become popular among tourists. At the same time, huge religious tourism establishments like Paharpur Buddhist Monastery are failing to contribute as expected to GDP due to inability to ensure full participation of stakeholders in tourism. This chapter portrays the potentials, problems and possibilities of Somapura Buddhist Vihara at Paharpur as a religious tourism hub based on the views of stockholders through the intensive field work. It also examines the use of modern technology, such as AR Application, to offer this world heritage site as a tourism destination in Bangladesh.

Methodology

Qualitative methods were applied and the analysis was mainly explanatory in nature with some numerical data. The study employed the in-depth interview method for the data collection in line with reviewing the existing literatures on the Somapura

MahaVihara in the context of tourism. In this study, 200 samples were selected and taken interviews to understand the engagement of a possible technology application in a religiously important tourist site in Buddhist Vihara at Paharpur in Bangladesh. Moreover, national tourism plans and policies, daily newspaper and research articles, research and governmental reports were analyzed for finding out the research gap. We used these terms ''Somapura Buddhist Vihara'', ''Sumpura Vihara'', ''Somapura Mahavihara'' and ''Paharpur Buddhist Vihara'' and ''Somapura Buddist Mahavihar'' in different contexts in this chapter.

Historical and Archaeological Background

Francis Buchanan Hamilton first visited the site in 1807 and 1812 while conducting a land survey. Sir Alexander Cunningham visited the site in 1879 and began excavating the mound, which looked like a mountain (Hossain & Alam, 2004: p.1). During the pre-independence period of Bangladesh from 1923 to 1934 large scale excavations started here. From 1981 to 1991, after independence, the Department of Archeology conducted re-excavations at Paharpur (Department of Archaeology and UNESCO Report, 2004: pp.2–5). A copperplate found in Paharpur and the discoveries of some inscriptions have been of great help in tracing the period of different eras of this monastery. A copperplate of 159 "Guptabda" (The Gupta era is a historical calendar era and it was used by the Gupta emperors, as well as their vassals and their successors in present-day northern ancient India and Nepal) or 479 AD found in the north-east corner of the Paharpur Buddhist monastery mentions that a Brahmin couple bought and donated some land at the Guhanandi monastery at Batgohali for worship and rest (Hossain, 2008: p.23). In the seventh century AD, the monarchy of Bengal suffered the same fate as the other Jain religious institutions of Punadravardhana. The Buddhist Pala Empire was established in Bengal in the eighth century. Maharaja Dharmapala Deva [770 (Qanungo, 1990: p.9; Majumdar, 2005: p.48)/775–810 (Bandyopadhyay, 1330 [Beng.]: pp.138–144)], the second king of the Pala dynasty of Barindri, established a monastery or center for the teaching of Buddhism at Somapura in the late eighth or early ninth century with a large temple for the propagation of Buddhism (Hossain & Alam, 2004: pp.4–9). For this reason, a seal found in the excavation has clearly written "Sridharmapaladeva Mahavihara in Srisomapura" (Roy, 1959: p.605). The monks of the newly built Buddhist monastery received royal permission to enjoy the land under the Jain monastery as well as to keep the original documents with them. Although known as Paharpur, the real name of this monastery is Somapura Mahavihara. Somapura means city of the moon. For 300 long years, this monastery was a place of pilgrimage for Buddhism, always full of scholars and scholars (Kristi, 1987: pp.14–18). At that time, the fame of this monastery spread to Burma, Malaysia, Indonesia, Tibet and as far as China. Somapura Mahavihara was located in the middle of Pundranagar (now Mahasthangarh in present day Bogura district) and another prosperous city Kotivarsha (present day Bangarh in Dinajpur district), the capital of the

Pundravardhana kingdom of ancient Bengal (Majumdar, 2005: p.213). This mountain-like central temple was called by the Pala kings as a barrier to the sun. With this unique temple, the construction of a large and attractive monastery in a new style was first started in ancient Asia (Majumdar, 2005: p.209). After the death of the Pala king Mahipala II, when the Pala Empire was in turmoil, the Burmans from Orissa and later the Sena dynasty from the Deccan invaded Barindri and damaged Vihara more than once (Roy, 1959: pp.236–37). Later, when the Muslim rule started, it was gradually abandoned and turned into a hill and the once prosperous Somapura Vihara took shape (Barua, 2007: pp.52–54) (Fig. 10.1).

Excavations at Paharpur have uncovered the ruins of a Buddhist monastery measuring 356 feet in the north-south and 314 feet in the east-west called Somapura MahaVihara. The 0.85 million square feet Vihara precinct is surrounded by a 5 meter wide square and a 3.6–4.4 meter high boundary wall. Although the walls are not very high, their thickness and the size of the adjoining rooms suggest that they were probably multi-storied, in keeping with the high central temple. Using the boundary wall as the back wall, there are a total of 177 rooms, 45 on the north arm and 44 on each of the other three arms (Majumdar, 2005: pp.208–209). These 13-and-a-half-square-foot rooms were occupied by Buddhist students named Bhikkhu. A total of 800 monks could live in this monastery. The rooms are classified in the land plan. The rooms were originally intended to be used as monasteries for monks, but the location of so many altars suggests that in later times the rooms were used for worship or prayer. There is a huge corridor 9 feet wide in front of the rooms. The 92 rooms with square altars or offerings were probably used for prayers (Hossain, 2008: p.24). There are altars of various shapes and sizes, portraits of the central temple, Penta-temples, kitchens, dining halls, paved drains and water wells in the southeastern part of the Vihara precincts. In the north arm, a huge hall house 120 feet long was the dining hall of the monks of Vihara. Next to the kitchen is a giant furnace structure made of bricks, with five stoves on each side. Next to the kitchen is an ancient brick well, which used to meet the demand for drinking water in Vihara. Adjacent to the well, there is a penta-temple altar that looks like a star

Ground plan of Somapura   Current Image   Fictional Image
Mahavihara
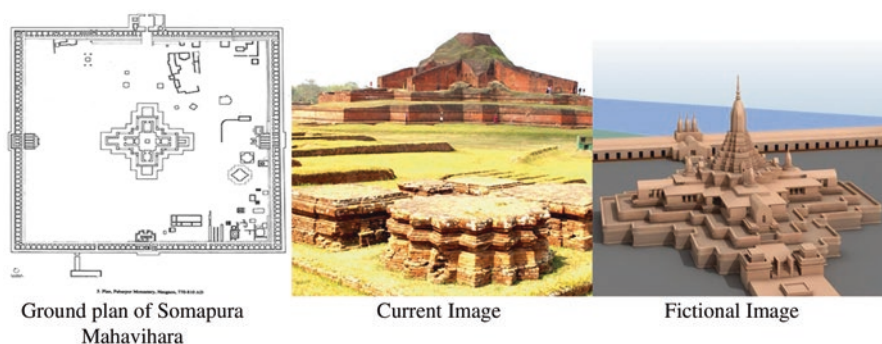
Fig. 10.1 Somapura Mahavihara (source: Banglapedia, 2020)

with 16 ornate angles (Hossain, 2008: p.28). In addition to the main arch to the north, there was another narrow rectangular entrance on the eastern side of this arm. Although there was no similar path on the west and south arms, there was probably a small entrance along the middle of the east arm. In addition to the central temple, there are ruins of many other small buildings in the open courtyard of Vihara, which were built at different times. In the south-eastern part of the courtyard, in front of rooms 73 and 74, there are 5 temples of different shapes. The tops of the temples are specially ornamented and the foundations also have ornate projectile semicircular cornices (Qadir, 1963: pp.5–10). Between the dining hall and the kitchen there is a paved sewer 46 meters long extending to the north and three wells in a row to its west. These were probably used for both household needs. There are several rectangular ditches on the perimeter wall and a square brick structure with three ditches at the bottom for drainage (Majumdar, 2005: p.206). The main central temple is located right in the center of the Vihara courtyard. In front of the temple is the main entrance arch on the north arm of the defensive wall. The long house entrance is 50 feet long and 47 feet wide. Next to the eastern wall of the central temple, there is a portrait of the monastery. At present, the central temple, which is about 21 meters high, has an area of 27 square meters, although many people think that it was at least 30 meters high. The temple is built in a cross-shaped land plan and in tree steps descending like a pyramid (Kristi, 1987: pp.40–42). The huge temple is built on different stages with its attractive architectural features centered on the upstairs empty square room above the steps. Four rooms and a "Mandapa" have been constructed around the second and first steps by adding new walls horizontally to the walls around this central room. In parallel to the plan of this temple, a circular path surrounded by walls has been constructed. As a result, the temple takes the shape of a cross and additional protruding angles are created in the space between the two arms of the cross. There is a perimeter wall around the temple in keeping with the foundation plan (Qadir, 1963: pp.5–10). Needless to say, the hesitant renovations, connections or changes of the later period did not hinder the basic plan of the temple. At the base altar of Somapura Mahavihara there are sixty-three stone idols of Hindu deities, which are covered with earth. The square temple with four entrances and a "Mandapa" is called ''Sarvatabhadra Mandir'' in Indian archeology. The temple discovered in the Paharpur excavations therefore belongs to the most aristocratic class (Roy, 1959: p.605).

Tourism in Buddhist Vihara at Paharpur

Excavations at Paharpur at various times have yielded a large number of terracotta statues, coins, fragments of various types of pottery, inscriptions, copperplates and several statues of gods and goddesses. Apart from the idol of the Buddhist god "Padmapani", all the other idols discovered are of Hindu gods and goddesses. The presence of idols of so many Brahmanical deities in this huge Buddhist monastery naturally attracts everyone's attention. It is believed that the idols were collected

from any of the eastern or adjoining structures and placed on the foundation of the main temple. Most of them dated between the tenth and the twelfth century. It is to be noted that the common feature of the heads of all the Buddhas found in Paharpur is the extended leaves of the eyes and a bunch of curly hair on the heads of some of them (Hossain, 2008: p.54). Most of the pottery dates back to the Pala period, but some fragments of a class of pottery from the sixth to the seventh century (pre-Pala period) have been found. The bottom or side of the pots also has a horizontal line design. Also found were lots of lids, large dishes, pies and lamps (Hossain & Rahman, 2016: p.19). The role of terracotta plaques is most important in the decoration of the walls of the temple. More than 2000 plaques are still adorning the temple. In addition, about 800 plaques have been collected from the site in scattered condition during excavations (Hossain, 2008: p.35).

During the excavation of the monastery, coins of 127 AH (mentioned in 788 AD) of Caliph Harun-ur-Rashid of Baghdad were found in a clay pot in room 125. Among other coins, six belonged to Sher Shah of Delhi (1540–45 AD), two to his son Islam Shah (1545–53 AD), three to Mughal emperor Bahadur Shah (sixteenth century), and two to Sultan Dawood Khan Karrani of Bengal. One of the Mughal emperor Akbar and one of the copper coins of Sultan Husain Shah Sharqi of Jaunpur are notable, all other coins are silver (Hossain, 2008: pp.51–52). It is difficult to say for sure how these coins got their place in Vihara. It is believed that the coins were brought to Somapura Vihara by the defeated Muslim army (Hossain & Rahman, 2016: p.18). The site museum adjacent to Paharpur Buddhist monastery has been made with these collected antiquities. The museum was established in 1993 under the auspices of the Norwegian government. Various antiquities of the sixth to twelfth centuries have found a place in this museum. The museum has the most relics of the Buddhist Pala and Hindu Sena periods, but there are also some antiquities of the Muslim period. These antiquities, which have survived the ravages of time, hold in their hearts the legends of the golden past. In 2016, the museum has world class advanced technology and state-of-the-art lighting system, world class security system such as closed circuit camera, fire extinguisher and detection device, air conditioner, digital display panel projection screen and top graphical model gives ideas about archeological structure.

It is observed that the reasons behind visiting the "Somapura Mahavihara" are: first, to observe the architectural beauty of Paharpur Vihara; second, to take pictures for photographic collection of such a historical site, thirdly, a group of people come and enjoy or have a picnic here; and last, visit the museum, information center and ruins of Paharpur Buddhist Vihara. Some of the informants (tourists) expressed their experiences of the visit at Somapura Vihara that the ruins were very impressive, the central stupa is huge and decorated with a number of terracotta bas reliefs around the lower levels. Around the edge of the site are the remains of monks' cells and the outlines of several other buildings which made up the monastery. The museum is small but worthwhile with some of the artefacts found on the site (no photos allowed inside). Allow 2–3 h to comfortably see it all including the museum. During the afternoon when we arrived it was very noisy and busy with groups of Bangladeshi tourists, we stayed overnight in the onsite rest house which meant we were able to

Table 10.1 Age of the respondents. (Source: Fieldwork by the authors, 2019)

Age	Frequency	Percentage
10–20	27	13.5
21–30	68	34
31–40	40	20
41–50	34	17
50+	31	15.5

Table 10.2 Gender of the respondents. (Source: Fieldwork by the authors, 2019)

Gender	Frequency	Percentage
Male	128	64
Female	72	36

Table 10.3 Educational qualification of the respondents. (Source: Fieldwork by the authors, 2019)

Educational qualification	Frequency	Percentage
Primary School	24	12
Secondary School (SSC)	38	19
Higher Secondary School (HSC)	45	22.5
Graduate	52	26
Post-graduate	41	20.5

get up at sunrise and wander around the ruins completely alone – the stupa looked really magical in the early morning mist. The following tables delineate the tourist's status to experience in Buddhist Vihara at Paharpur in Bangladesh.

According to Table 10.1, the maximum number of 34% of the 200 respondents is between the ages of 21-30 years. On the other hand, the lowest number of 13.5% respondents is between the ages of 10-20 while 15.5% of the respondents are over 50 years. Rest of the respondents (37%) age is 31 to 50 years. From the observation it is understood that large number of tourists are students but a mentionable number are senior citizen.

In this study as in Table 10.2, the large numbers of respondents (64%) were male, while a significant number (36%) of respondents were female. From the field level data, it is seen that less number of female tourists than male have visited Paharpur spot. Most of the tourists have come from the northern part of Bangladesh though a significant number of foreigners come to visit here, mainly from India, China, Russia, and Japan.

It appears from the Table 10.3 that near about half of the total respondents (46.5%) have at least a graduate or higher. On the other hand, 22.5% of the respondents have educational qualifications up to HSC level, while the remaining 31% of the respondents have basic primary and secondary education. The table says that, highly educated people have frequently visited the Buddhist Vihara at Paharpur to know the ancient history of Bangladesh.

Sustainability Issues on the Buddhist Vihara

The condition of the monastery was not so bad when it was discovered in 1934, but over the past half-century, its condition has deteriorated to such an extent that the very existence of the monument is under threat due to waterlogging and salinity. Waterlogging continues to erode and distort the foundations of the central temple, the stone statues adorned on the foundations, and the terracotta plaques. As a result, an application was made to UNESCO in 1973 for the preservation of Paharpur Buddhist Vihara. In view of this, the site was included in the World Cultural Heritage List in 1985 under a master plan adopted by the International Mission in 1983. A project started in 1986 with the help of UNESCO was implemented in three phases and completed in 2002. Under the project, conservation of architectural structures of Vihara, drainage, construction of museums and other infrastructures were completed (Department of Archaeology and UNESCO, 2004: pp.28–29). In 2011, the Department of Archeology undertook another new project to address the issues of tourism system development, heritage management, conservation of ancient landforms, etc. Renovation work is going on almost regularly in this monastery which is a holder of world heritage. Not only in name, but also in the name of conservation reform, the shape of Somapura Mahavihara has been changed, locals said. However, in 2002, many archaeologists objected to the renovation of the walls of the main temple in Vihara and the re-installation of terracotta plaques (Daily Samakal, 2015). In 2016, it was reformed under the South Asian Tourism Infrastructure Development Project for the development and renovation of Vihara with the funding of the Asian Development Bank and the Government of Bangladesh (UNESCO, 1985), through the Dhaka-based contractor M.A.S. Daily Construction Limited. Among them, a pond was dug at the entrance of Somapura Vihara at a cost of BDTk 8 crore 86 lakh for construction of structural development works, construction of entry complex, ticket counter, souvenir shop, guardroom, food court, toilet, picnic shed, dormitory, mosque etc. The renovation of the main monastery was done at a cost of BDTk 45 million through hundreds of trained workers from home and abroad. For example, removal of waterlogging in rain water during monsoon season, improvement of drainage system, removal of grass growing on the main monastery, re-construction with lime-surki, re-excavation of closed wells and fencing of wells with railings (Daily Samakal, 2016). But after 3 years of renovation, the wooden bridge at the entrance to the Vihara premises and the only main wooden staircase to the central temple collapsed. As a result, the mouth of the stairs was closed with a bamboo fence a few months ago. Old-fashioned burnt clay tablets were hung on the walls of the temple. Most of those plaques are gone now. And the ones that are there are slowly falling and breaking (Daily Jai Jai Din, 2019).

Due to the lack of professional archaeologists and conservationists in the Department of Archeology, many feel that the conservation of Somapura Mahavihara has not been completed in accordance with the principles of repair archeology. Although a lot of money has been spent on conservation of Vihara, the overall condition has deteriorated, not improved. Ataul Haque Siddiqui (62), a local expert,

asserted that I hope that this new reform will not bring any new disaster for Somapura Mahavihara. In this regard, one of the informants named Obaidur Rahman (50) opined that "all in all, it seems that "Somapura Mahavihara" is getting lost in Paharpur tourist center". AKM Shahnawaz (60), a Professor in the Department of Archeology at Jahangirnagar University, explained that, "Paharpur Vihara has all kinds of glory. This eight-century monastery confirms with its antiquities that residential universities were established in our country when the primary practice of primary education was not even introduced in Europe. There were about two and a half thousand terracotta plaques all over the central temple of Vihara. Not only did these reflect the artistic charm of the eight centuries, but the motifs and features of the paintings showed that a non-communal society was established in that era under the care of Buddhist kings, which was carried by the Bengalis for thousands of years. But without considering these, the terracotta plaques were removed from the walls in the name of reform in violation of the general customs and laws of heritage preservation. Placed in a five-inch brick tin roofed storage, which will deteriorate quickly or in any other way could cause 'system loss'. Instead, imitations or replicas of plaques have been made on the walls in tenders worth lakhs of money. At one stage of our protest, PaharpurVihara is now standing in a stateless half-naked state. Nowadays, reforms are being carried out by bringing in foreign experts. I don't know what the consequences will be" (Daily Kaler Kantho, 2018).

It is understood that there is a lack of coordination between the archeology department and the local experts and local people in the renovation and maintenance of the monastery.

Augmented Reality Application at Buddhist Vihara Tourism

During the last decade, Buddhist Vihara at Paharpur witnessed an increase in visitors. The Buddhist Vihara, the world heritage site, at Paharpur in Bangladesh is a good example to know the prehistory of this existing structure. Augmented Reality (AR) in Buddhist Vihara tourism offers another effective alternative to know the cultural and religious practice of the history of Buddhism. The visual representation of the Buddhist Vihara with the help of AR may attract tourists much more than before as most of the respondents asserted. Many people think that tourism in Bangladesh is still managed with domestic tourists in mind, which is why the touch of technology between Bangladesh Tourism Corporation, tourists and tourism stakeholders is negligible. Religion based tourism, like Buddhist Vihara in particular, is not just a recreational space, it is an overall criterion for presenting history and tradition of the country to the world. Many tourists have talked about modern AR technology based tourism in the development of domestic tourism industry keeping pace with the world. Although the concept of AR is completely new to the tourists of Bangladesh, all the tourists have unanimously agreed that such technology is more conducive to the tourism promotion in Bangladesh. Tourism as an industry in Bangladesh has not yet developed because domestic tourists do not know where to

visit and how to go. Without knowing whether there is a food facility in the place, the tourists set foot towards an unknown destination. Where domestic tourists face various harassment, it is natural that foreign tourists will face various problems. In addition to language problems, there is a lack of quality food for foreign tourists. Shahnaz Sultana (32), a female tourist who came to Paharpur Buddhist Monastery, criticized that "there are no good food restaurants here, no arrangements to spend the night. We are from Khulna. I heard that there is a rest house of the Department of Archeology in Paharpur; I thought I would stay here. But if you want to stay here, you have to contact Bogura or Dhaka office in advance. I'm in trouble now". If there was AR technology in the tourism industry, they would not have faced such problems; they think that many people would be interested in coming to Paharpur. With the AR mobile app, foreign tourists can easily learn about Paharpur Buddhist Monastery, choose the food restaurant, hotel and room of their choice, and experience the journey in the vehicle of their choice without any problem. This will increase the number of foreign tourists in the Buddhist monastery and the country's reputation.

Stakeholders' Engagement

In the case of Paharpur Buddhist Monastery, declared a World Heritage Site, the task is to involve the local people in the protection of this invaluable resource. For this, first of all, by identifying the "beneficiary areas" and creating new earning opportunities for the local people, they should be made interested in its maintenance. Second, since its management system is controlled solely by salaried government officials and employees, people are reluctant to consider it their own asset. Therefore, the formation of a "Local Management Council" involving government officials and employees as well as local people's representatives will increase both the country's values and tourism in the international arena. Custodian of Paharpur Museum Abu Saeed Inam Tanvirul (58) reported that 3 lakhs 93 thousand 286 visitors visited the Buddhist monastery in the last 2018–19 financial year (Daily abnews24, 2019). Despite such adversities, the arrival of a lot of tourists proves that there is immense potential for tourism in Bangladesh. Despite having a lot of potential, the administration is failing to introduce the world heritage Paharpur Buddhist monastery to the world. The main reasons for this are lack of coordination among tourists, local and government officials and employees and lack of technology-based tourism. Tourist Selim Reza (22) stated that "Paharpur is a historical place. I have read in the book. Face-to-face reading will reveal more real history than a book, but here the knowledge is limited. What was the real meaning of the monastery? What was it made for? How was it destroyed? Developed countries need to have a system to show it through technology. Then tourists would get answers to all the questions but now they have to take a dissatisfaction". Hasan Ali (42), a local resident, stated that "Paharpur Vihara was not getting the expected number of tourists due to lack of publicity and care. Every day some foreign tourists come but their

Table 10.4 Stakeholders of the tourist spot. (Source: Fieldwork by the authors, 2019)

Stakeholders	Frequency	Percentage
Local people	78	39
Tourist	99	49.5
Government official	23	11.5

vacation arrangements are less. In the financial year 2018–19, the income from here was only BDTk 77 lakh, but with proper publicity and care, the income would have been several times higher". It is observed in the tourism industry of other countries of the world that local people play a huge role in the development and popularity of tourist spots. This increases the economic dynamism of the region and at the same time creates employment opportunities. Keeping in mind the needs of domestic and foreign tourists, the government and private initiatives centered on Buddhist Vihara in Paharpur, Naogaon and Joypurhat districts are not very visible. This proves that the local people are not involved in the development of tourism. Most of the tourists reflected that it is a lack of administrative co-operation.

Talking to different types of people through fieldwork, it is identified that Paharpur has not become very popular as a tourist destination yet. Paharpur Buddhist Vihara has potential for development in tourism in Bangladesh, but the picture is disappointing. Government officials and local community can work together to flourish these spots to the domestic and international tourists. It appears from the Table 10.4 that, around half of the informants were tourists (49.5%), whereas only a bare minimum figure of informants were government officials (11.5%) and rest of the 39% was local people.

Marketing Communications and Channels

According to a survey by the BBS, the tourism industry has contributed to the national economy BDTk 16,000 crore (Daily Kaler Kantho, 2019). But just as there is no promotion of tourist spots in Bangladesh, there are also no facilities for tourists. On the other hand, there is no such initiative to attract foreign tourists to the country. In the tourism industry of Bangladesh like in the developed world, it is possible to introduce foreign tourists to the thousand years of history and tradition of Bangladesh through AR or Virtual Reality (VR) technology. At the same time, it is important to provide quality hospitality and security keeping in minds the needs of foreign tourists.

The Director General of the Department of Archeology, Md. Altaf Hossain (59) stated that "We will do a site package tour in Paharpur. It will be experimental. And it will encourage other tour operators. We can't do everything, but if we act as guides, we will understand the problems and get things done quickly". Bangladesh Tourism Corporation under the Ministry of Civil Aviation and Tourism works officially in tourism in Bangladesh. Their vision is to make Bangladesh a leading tourist destination in South Asia and includes three missions – to create tourism facilities,

develop human resources for better services and encourage community-based tourism (Bangladesh Parjatan Corporation, 2019). It is possible to showcase the tourist spots of Bangladesh to the world through social media and broadcasting of tourism related programs on public-private television channels. However, in that case, the names, history and heritage of the tourist spots should be highlighted carefully so as to make them attractive to foreign tourists.

Abdul Quader (52), a local school teacher from Paharpur, opined that "we are erasing thousands of years of history and tradition by making 'Somapura MahaVihara' to 'Paharpur". As a result, the world is losing its appeal and importance. In the history of the country and abroad, there is mention of Somapura MahaVihara in the literature, not of Paharpur. Such an emotional naming has lost the attraction of tourists to this world heritage and has tarnished the image of the place. He expressed his opinion to the government and the tourism department that in order to preserve the heritage of the monastery, it should be promoted as 'Somapura MahaVihara' as per the name found in the ancient inscriptions. The government of Bangladesh declared 2016 as the first three-year (2016–18) tourism year after independence. According to a study by the Bangladesh Tourism Board (BTB), foreign tourist arrivals have increased and 2 per cent of tourists travel to North Bengal to see various antiquities (Daily Kaler Kantho, 2019)

It is found from the observation that, most of the respondents (about 50%) know about the Buddhist Vihara at Paharpur in Naogaon district through social media such as, Facebook, YouTube, Twitter, Instagram etc., while 28% tourists gave answer in favor of friends and relatives. In this regard, government websites, newspapers and magazines are not advertising much to brand the Buddhist Vihara as a tourist destination.

Tourist have a different goal and purpose of traveling to a spectacular place. Table 10.6 shows four different reasons and some sub- reasons for tourists to visit Buddhist Vihara at Paharpur. "Sightseeing" as the main reason for travel, a maximum of 59% of respondents are attracted by the place. In addition, 29% of the total respondents came to know the history heritage and the remaining 12% of tourists came to see the Archeological relics. The reason for the trip as "Relaxation", the highest number of tourists (81%) who came to Recreation. On the other hand, the remaining 19% of respondents came to the tourist spot to change their monotonous routine and travel around the country. Most of the 79% of the respondents in the "Work'' section have come to Paharpur for academic purposes, 16% for business tour and the remaining 5% for social activities. In the last part, "Other", 74% of the

Table 10.5 Knowing about the Buddhist Vihara at Paharpur tourist spot. (Source: Fieldwork by the authors, 2019)

Information about the spot	Frequency	Percentage
Government websites	9	9
Social media	50	50
Friends and relatives	28	28
Newspapers and magazines	11	11
Others	2	2

Table 10.6 Main reason for visiting the Buddhist Vihara at Paharpur. (Source: Fieldwork by the authors, 2019)

Reasons of visit	Frequency	1	2	3
Sightseeing	34	Visits of tourists attractions (59%)	Knowing history (29%)	Archaeological relics (12%)
Relaxation	31	Recreation (81%)	Removing monotonous life (6%)	Stay in the countryside (13%)
Work	19	Academic purpose (79%)	Social activities (5%)	Business tour (16%)
Other	15	Rehabilitation (13%)	Removing depression (13%)	Religion and culture (74%)

respondents who came to the Buddhist Vihara to gain knowledge about Buddhist culture. 26% of respondents came to reduce their anxiety and to refresh their stress. According to the various tourists, Paharpur Buddhist Vihara has a lot of prospect for the tourism development in Bangladesh. Therefore, tourists emphasize on increasing the facilities of the spot.

The contribution of tourism to Bangladesh's GDP is over 2 percent but lack of decent accommodation, standard facility, lack of enjoyment for the international visitors,insecurity, communication and travel problems, and infrastructural weaknesses are eroding the potential of the tourism sector (Daily Kaler Kantho, 2019). According to the Bangladesh Tourism Board (BTB) (2020), 1,69,008 foreign nationals visited Bangladesh from January to July 2019. About 260,000 foreigners visited Bangladesh in 2018, but there are no statistics on the number of actual tourists (Daily Kaler Kantho, 2019). According to the World Economic Forum (2020), on Travel and Tourism Competitiveness, Bangladesh has moved up five places from 125 to 120 due to the highest improvement in security and safety, but Among the 90 criteria for secured and flexible travel, Bangladesh's overall achievement have hampered for underdeveloped tourism service infrastructure, air pollution and waterlogging (Daily Naya Diganta, 2019).

A respondent named Habib Ali (67) depicted that "although there is a lot of potential for tourism in Bangladesh, it does not have the diligence and professionalism needed to harness it. That is why we are lagging behind in the tourism sector compared to other countries in Asia. The standard of our hotels has not been set yet. Many are running as Five Star even though they are not of two-star quality. In this case supervision should be increased. At the same time, we need to ensure that the facilities that are needed to offer quality services to the visitors are available in other countries. The responsibility of national airlines in the tourism promotion in every country is completely absent in the field of aviation in our country".

According to Table 10.7, based on the different views of tourists on what Buddhist Vihara at Paharpur looks like as a tourist spot, a maximum of 42% of respondents consider the "Security system" of the spot to be the "Excellent" type.

Table 10.7 Rating the facilities of the Buddhist Vihara at Paharpur as a tourist spot. (Source: Fieldwork by the authors, 2019)

Types of Response	Transport infrastructure	Availability of public transport	Availability of food facilities	Availability of hospitality	Opportunities for entertainment	Security system
Excellent	0	3	4	0	13	42
Good	8	22	9	7	17	27
Fair	12	58	51	16	41	21
Poor	23	9	25	25	24	6
Very poor	46	8	11	34	0	0
Can't judge	11	0	0	18	5	4
Total percentage	100	100	100	100	100	100

Table 10.8 Level of satisfaction. (Source: Fieldwork by the authors, 2019)

Level of satisfaction	Frequency	Percentage
Very satisfied	31	15.5
Satisfied	46	23
Medium	65	32.5
Dissatisfied	36	18
Very dissatisfied	22	11

In the eyes of 58% of visitors in terms of "Availability of public transport", 51% for "Availability of food facilities" and 41% for "Opportunities for entertainment" was rated as "Fair". But a maximum of 46% of informants reported "Very Poor" in the case of road transport and communication infrastructure, and 34% for residential hotels and accommodation facilities. However, a number of tourists were reluctant to comment on the tourism development at Paharpur as a tourist destination. Although roads and railways are popular with tourists but, there is a lack of improved transportation in Naogaon and Joypurhat both districts. However, if the tourist spots are attractive and the facilities can be increased then the number of tourists will increase in this region. The results of this study have given some good suggestions for the development of tourism in the Paharpur Buddhist Vihara.

As shown in Table 10.8, 32.5% of the stakeholders rated "Medium" on the overall level of satisfaction of Paharpur Buddhist Vihara as tourist spot. Overall, 23% of visitors rated "Satisfied" and 15.5% for "Very Satisfied" but, on the other hand 18% and 11% of the stakeholders were found to have given "Dissatisfied" and "Very Dissatisfied" views respectively. However, it is true that none of the tourists of this place were found to travel with fully satisfaction or dissatisfaction.

Conclusion

 Government of Bangladesh has taken necessary steps to improve current situation, but introduction of the technology based tourism like AR App is yet to be implemented. This app has recently played a hopeful role to promote tourism to the new generation. In the global tourism industry, the AR market is anticipated to develop from 5.91 to 198 billion USD by the year 2025 (Statista Research Department, 2020). After declaring Paharpur Buddhist Vihara as World Heritage Site by UNESCO, it becomes a tourist spot listed by the Department of Archeology of Bangladesh and the Bangladesh Parjatan Corporation. A good number of tourists travels there every day despite various adversities and even though they have a lot of complaints, they still want to come to Paharpur. All the partners in tourism think that Paharpur Buddhist Monastery has a glorious history of one and a half thousand years which is rare in the world. Many countries of the world have gained a reputation abroad by using such religious institutions as tourist spots but the absence of sustainable plan and policy, management and publicity, Bangladesh is lagging behind in this potential sector. Despite the government's sincerity in developing tourism in Bangladesh, there is no master plan for the tourism sector, so professionalism is not being created in tourism. A far-reaching plan is needed to make tourist spots in Bangladesh popular with foreign tourists. Keeping in mind the needs of tourists from different countries, star quality residential hotels, various types of restaurants, entertainment facilities, tourist spots need to be cleaned and beautified as well as security measures need to be simplified and strengthened. On the other hand, travel by road, rail and air is enjoyable and necessary steps have to be taken to get tickets. In this regard, if the use of technology like AR in the tourism industry is spread at all levels, both tourism related and domestic and foreign tourists will benefit. There will be an opportunity to know the thousand year old history of Bangladesh abroad. Other ministries and individual entrepreneurs of the Government of Bangladesh will have to stand by the Ministry of Civil Aviation and Tourism to make tourism in Bangladesh an industry. Awareness of technology-based tourism development facilities and tourism system to the local people, and local participation as partners and decision makers in tourism, will increase the quality of service, create employment opportunities as well as benefit both the people and the tourists.

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Chapter 11
Perceptions of Augmented Reality Application for Tourism Promotion in the Buddhist Vihara at Paharpur of Bangladesh: A Qualitative Research

Shah Alam Kabir Pramanik, Md. Rakibul Hafiz Khan Rakib, and Azizul Hassan

Abstract The study aims to assess the perceptions of the stakeholders and tourists towards the implementation of potential AR application within the cultural, heritage and museum context. Besides, this study has chosen the Buddhist Vihara at Paharpur World Heritage Site (WHS) as a sacred and religiously important tourist site in which the stakeholders' perception regarding possible implementation of AR is checked. This study also deliberates the concept of AR and application of AR in tourism. The reasons for applying modern technological tool like AR with the real world setting are identified. Essential components for implementing the AR tool at the site are explored and discussed. This qualitative research is mostly relied on in-depth interviews and focus group discussion for data and information collection in line with reviewing the existing literature. Data were collected from thirteen stakeholders and tourists. Findings of the study reveals that AR application has perceived positive benefits like experiential, economic, cultural & historical, educational and aesthetic value. This study also shows the challenges like management challenges, visitors' incapability, financial challenges and informational challenges those might hinder the implementation of AR at the site. The study moreover shows the relationship between sustainability and AR application. Besides, the authors argue that the implementation of AR application at the site will benefit the stakeholders (local community, visitors, employees, and tour operators etc.). Limitations and future research directions are given at the consequent stages of this paper.

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Introduction

Continuous development of technology has been tremendously changing the behavior of consumers in tourism and hospitality industries for last decades (Loureiro et al., 2020). In tourism and hospitality services industry advanced technology are prerequisite to meet the present-day needs and demands of tourists. Through the application of innovative technology visitors can get augmented services in information search, purchase, or even in post purchase stage (Ali, 2016; Lemon & Verhoef, 2016; Loureiro et al., 2020). For appealing and enticing the customers Augmented Reality (AR) is one of the best pioneering technological instruments that has been adopting in tourism and hospitality industries in developed countries since couple of years (Han et al., 2014; Siang et al., 2019). Many tourist destinations are constantly using the AR tools to accelerate the pace of development and increase the position in the tourism competitiveness (Han et al., 2014). Technological integration in providing business services especially in tourism services are becoming inevitable to sustain in the competitive market (Han et al., 2014). Advanced technology like augmented reality can be a viable strategic tool for the marketers of tourism products and services to satisfy the demand of tourism customers (Dadwal & Hassan, 2015). The concept of augmented reality is somewhat unidentified to traditional tourism and hospitality marketers and business policy planners nevertheless it has numerous possibilities and flairs (Neuhofer et al., 2012). The AR is an innovative means of communicating and involving consumers or tourists by enhancing their representativeness and delivering an experience that is much more than physical representativeness. Consumers' interaction with technological devices has increased all over the world which actually increased the potentiality of AR and Virtual Reality (VR) in tourism industry. Use of AR can enhance the tourist satisfaction and loyalty (Hassenzahl, 2003).

In Bangladesh, there are lots of tourist treasurers, spots, sites, monuments, museums, archeological structures which have great appeals to the tourists and visitors (Rakib & Hassan, 2020; Pramanik & Rakib, 2020). The appeals of the tourist can be enhanced by exploiting the benefits of advanced technological tools like AR which can provide interactive and memorable experiences. The marketers, policy makers and destination managers of Bangladesh tourism industry can exploit the AR applications to stimulate and expand the reality and eventually to engage the consumers in innovative and dynamic ways (Guttentag, 2010). This study explains the possibilities of technology supported tourism specially AR in the Buddhist Vihara at Paharpur of Bangladesh. Buddhist Vihara is one of the most imperative archeological sites in Bangladesh which had been acknowledged as World Heritage Site (WHS) by UNESCO in 1985. This study explores the perceptions (positive and

negative) of stakeholders of the destination regarding implementation of potential AR tools. Moreover, present study also describes how AR can help the destination marketers and managers to change the usual perception and provide better visiting experience to the tourists.

Brief Synopsis of Paharpur Buddhist Vihara with Its Structure and Constituents

One of the most antique and remarkable archeological sites which is situated at the Paharpur, Badalgachi Upazila of Naogaon District of Bangladesh is Paharpur Buddhist Vihara. The early name of the Vihara was Somapura Mahavihara. Paharpur Buddhist Vihara was constructed during the Pala period in seventh century when the monarch of ancient Bengal was Dharma Pal. The Vihara reflects the history of different religions of the region namely Buddha, Hindu (Sanatan dharma), and Jaina. The Vihara also used as an important intellectual center for the Buddhists, Hindus and Jains. Although this monastery was reduced to rubble due to historical and geographical reasons, this glorious monastery still stands pompously as the largest Buddhist monastery in Asia. The Vihara is also known as mini version of the ancient Nalanda University. In 1985 UNESCO announced the magnificent monastery as a World Heritage Site (WHS).

The style and structure of the Vihara was unique in the subcontinent. The unique Vihara is led by a temple which was not also usual. The features of the temple were not similar with the features of the temples of Indian subcontinent. Actually the temple reflects the structure and memories of Buddhist temples of Cambodia, Burma and Java (The Daily Asian Age, 2016). The Vihara has cruciform basement, attached structure with inset chambers and progressively declining pyramid (The Daily Asian Age, 2016). The Vihara is almost 72 feet high from the ground and the Vihara with its remains covers 27 acres of land (Hassan & Rahman, 2015). In the Vihara there are 63 stone plate statues are available which reflects the different religious beliefs and traditions (The Daily Asian Age, 2016). Various decorative terracotta plaques are insisted in the outside walls of the Vihara. The whole area is spread over a number of temples, stupas and ancillary buildings (Hassan & Rahman, 2015). The complex is surrounded by 177 small lodging rooms for the monks. The remains of slabs to place Buddha's statues are found in each room which shows that monks were always in the presence of Buddha and even spent their private time in study, meditation and also for accommodation. Another attraction of this Vihara is it has a central temple which is cruciform ground plan. The temple has a length of 357 feet from north to south and a width of 314 feet from east to west (The Daily Asian Age, 2016).

Adjacent to the Vihara there is a well-maintained museum with a collection of old relics from its prime period, where enormous information is available. The name of the museum is "Paharpur Museum, Naogaon" which was established in 1957 and

extensively modernized in 2016. Different statues, ornamental terracotta plaques, stones, sands stones, ornamental bricks, ceramics, carvings, remains and relics of the Vihara are reserved in the museum for demonstration which are impressive and were collected from Paharpur and its surrounding areas. Some of the mentionable names of the statues are Broken Parts of "Visnu", "Broken Statue of Laxmi Narayan", and "Uma" which are the statues of Krishna Stone. "Chamunda", "Keerti", "Gouri", "Visnu", "Mansha" which are Clay Stone of statues. Besides those there are some other statues which are "Seetala" statue of Red Stone, damaged "Haargouri" statue, "Nandi Statue", "Sun Statue" and so on. The antiquities of the museum are made of diverse ingredients and they carry memories of different eras. There is a well decorated garden outside this museum. There are charming topiaries with elephants, giraffes and a number of other features in the garden. The great monastery also comprises of picnic spots, shades and mosque outside the monastery.

Significance of the Study

Nevertheless, the Paharpur Vihara is very affluent in the richness of history. Various antiquities of the sixth to twelfth centuries have found a place here. The Vihara has the largest number of relics of Buddhist civilization. In the glory of life, roads, history and tradition the Vihara is very colorful and lively. The destination contributes greatly to the local and national economy. The revenue from this monastery in income year 2016–2017 was BDTk. 72 lakh, and soared further to BDTk. 77.25 lakh in the income year 2017–2018. In 2018–2019 the income was BDTk. 76.60 lakh. As prices of the ticket were reduced, revenue decreased to BDTk. 56 lakh in 2019–2020 (The Daily Star, 2020a, 2020b). Many small and small & medium businesses have been formed around the archeological monastery of Paharpur. Various small business like restaurants, grocery stores, showpiece items shops, fancy goods stores and so on have been sprung up around the site. The destination has great appeals to visitors and it attracts visitors and tourists from home and abroad. Normally, more than one thousand visitors visit this destination every day and in winter season it's around three thousands per day (Sardar et al., 2020). The authors of this study have observed that the destination as well as the museum is beautifully decorated. The natural beauty around this monastery has been enhanced by the destination authority. The destination and its objects suffer from the problem like lack of information, scarcity of instruction, paucity of tour guide services etc. Visitors don't get enough and desired information from the visitation of the site. There is not enough information available on the physical site about the great monastery, as the artifacts and antiques of the monastery do not offer enough information to the visitors. Lack of instructions and tourist guides for proper visitation for the tourists are very apparent at the destination. Erosion of terracotta, ornamental terracotta plaques due to salinity, damp climate, lack of care and negligence also create the issue of sustainability of the second largest Vihara in the South Asia (2007; The Daily Star,

2020a, 2020b). The decay of walls and embellishments also causes the sustainability challenges of the destination. A site official anonymously argues that "from the original terracotta plaques, only 17 are demonstrated at the adjacent museum of the monastery while the rest are stored without proper care" (The Daily Star, 2020a). Proper maintenance and integration of the most advanced technological tools (AR, VR or MR) of tourism in the monastery can minimize the sustainability challenges. The destinations and museums like this in the different countries of the world are using AR and VR tools to provide more pleasant experience to the visitors (Han et al., 2014; Siang et al., 2019). Paharpur Buddhist Vihara can exploit the advantages of using advanced technological tools like AR and VR to differentiate and position itself from the other destinations in home and abroad.

Traditional Practices and Possibility of Modern Technologies

Generally, what do the managers practices at any archeological site for ensuring better visitors satisfaction? They give emphasize on managing the cleanliness, ensuring the aesthetic environment, displaying innovative and modern look and so on (Cianciarulo, 2015). That becomes the traditional practices in the developed countries. Visitors visit the archaeological destinations to know about the objects in details but in most cases which are not used in many developing countries like Bangladesh. Archaeological destinations are not only the representation of different collections of objects, statues and relics. Every object, statute, relic and terracotta has significance because that represents the history of a certain time. Even if any smallest object is present that also had been used at that time to perform specific task. Actually, now-a-days visitors would like to interact with the objects which mean "talk to". Direct interaction with the objects will fulfill the thirst of visitors. The question is how is it possible? Direct interaction with objects is possible with the help of the application of AR tools. The Paharpur Vihara has huge opportunity to use the AR applications. At Paharpur Vihara the authority maintains a good environment for visitors but lacks the information about the destination as well as the objects. In the present world, as part of their everyday interactions, visitors engage more with technological devices. This essentially provides the ground for the extension of technologically allowed destination management strategies (Neuhofer et al., 2012). There is currently no direct interaction with the Vihara objects, which is the present demand of tourists. To sustain in the competitive market, the Vihara has to adjust with the modern tools to provide direct interaction to the visitors. In the adjacent museum there are many old relics, statues and objects which are presented with some basic information but visitors want to know more. Visitors would like to know why and when the objects were used. What was the specific task of the objects? Protecting objects at any archeological site means that keeping the objects as it is. Reuse, modification or renovation of any of the object or instrument with historical value is impossible, so in this regard AR tool can be used to create new interactive services to the visitors (Cianciarulo, 2015). With the support of AR implementation

some interactive themes can be twisted at the Vihara. To fulfil the thirst of the visitors there is no alternative of the application of the modern tool like AR. AR development process and its possibilities and requirements are discussed at the following sections.

What Is Augmented Reality?

Although AR research has received attention since 1960s in the field of computer science, it's get less attention in the general field till 1999s due to the limitations of technological facility (Liang & Elliot, 2020). AR is an instrument that is used to improve the reality with virtual material. AR is basically the overlap of layers with information of various kinds such as videos, graphics and audios to the real world (Azuma et al., 2001; Chung et al., 2015; Cianciarulo, 2015; Kounavis et al., 2012; Milgram et al., 1995; Milgram & Kishino, 1994). AR might usually be described as the refinement of a real-world environment using textures of computer-generated images, videos, voices and texts via a device (Guttentag, 2010; Jung et al., 2018).

AR is a digital reinforcement of an individual's sense of sight and hearing that is frequently accessed through smart glasses (head-worn projective displays), laptops, computers, tablets and smartphones (Buettner, 2017; Carmigniani et al., 2011; Liang & Elliot, 2020; Rauschnabel et al., 2019). AR is portrayed as an application that adds the present reality with computer-made virtual objects that seem to exist together in the same space as the present reality (Azuma et al., 2001). In AR, for virtual-aligned wall projections on long spans or for 3D video mapping, see-through displays (electronic displays with real objects) or spatial augmented reality (SAR) are used (Loureiro et al., 2020). Over the real-world scenarios, AR also presents levels of virtual features like text, images and videos to the customers (Scholz & Smith, 2016).

Applications of Augmented Reality in Tourism Industry

AR applications have been using in numerous fields like marketing, retailing, education, event management, medical services, tourism and culture and so on (Cianciarulo, 2015; Han et al., 2017; Siang et al., 2019). The possible application of AR in tourism was recognized by tourism researchers and industry leaders as early as 2000 (Liang & Elliot, 2020). While AR has crossed the buzz stage, the technology is just about to be applied in the tourism industry in a significant way (Han et al., 2014). Technological advancement such as AR has become an important topic for tourism researchers, and the instrument is thriving, promising and increasingly applied in the field of tourism and culture (Han et al., 2014; Liang & Elliot, 2020; Siang et al., 2019; The Wall Street Journal, 2016; tom Dieck & Jung, 2015).

AR is applied in the People's Museum at Melaka (World Heritage City declared by UNESCO) in Malaysia. When the museum faced downward trend of visitors then they applied the AR tool to reboot the visitation towards the museum. In that museum AR mobile App was developed to enhance the visitors experience and to examine the user's acceptance towards the AR mobile App. The study reveals that 93.33% of the respondents had shown satisfactory travel experience when present objects are overlaid with virtual objects through AR mobile App (Siang et al., 2019). In the Dublin Heritage Trail, Ireland the AR application project based on smartphone was developed and user's acceptance also had been tested. In that study both GPS based AR and marker based AR were used (Han et al., 2014; tom Dieck & Jung, 2015). AR technology was also used in a number of potential urban heritage tourism destinations in Dublin (Han et al., 2017).

At the MUVIG museum in Italy the AR was used to change the usual perception and increase the awareness among the visitors. In that museum the researchers selected some objects and collected information about the objects. Then they created videos for the objects with relevant information and created a hidden layer visible with AR applications. The study used the free and famous software: Aurasma for AR application. At first visitors have to download and activate the software into android and then by activating the layer scanning QRCode, visitors can enjoy the computer generated objects with real objects in an exciting and interactive manner (Cianciarulo, 2015).

Several studies have been carried out to explore the development of visitor experience using AR by handheld and wearable devices (Chung et al., 2015; Han & Jung, 2018; tom Dieck et al., 2016). As the speed of AR growth hastens, cultural heritage sites have begun to concentrate on the opportunities offered by this modern and creative technology (tom Dieck & Jung, 2017). In cultural heritage tourism sites, AR is consistently used to maximize tourist positive experience (Jung et al., 2018). Mobile AR applications are developed and implemented at different cultural heritages sites as Deoksugung and Gyeongbokgung Palaces in South Korea, the British Museum in UK, An Post Museum in the Republic of Ireland, the Louvre in France in the last couple of years (Chung et al., 2015; Jung et al., 2018). At different cultural heritage tourism destinations, cross-cultural variations in the implementation of mobile augmented reality have also been addressed. In adopting the mobile augmented reality, the diverse cultural contrasts were analyzed (Jung et al., 2018). The results of the studies show that the aesthetic appearance and presence of AR have a big effect on perceived enjoyment. To digitally restore the old relics and precious statues, to re-create historical events and to prevent cultural heritage sites from decaying, AR is being used in the context of cultural heritage tourism extensively (Haugstvedt & Krogstie, 2012; Jung et al., 2018).

Many museums, archeological sites and cultural and heritage destinations are using digital spaces like AR to enrich visitors experience into something more interactive, amusing and exhilarating styles (tom Dieck & Jung, 2015). As AR is using the digital space to deliver supplementary value, it is also true that AR safeguards the sustainability of the heritage sites and their objects (Han & Jung, 2018).

Components of Possible Augmented Reality System
for Paharpur Vihara

The way users communicate and interact with the tourism environment has been modified by recent technological developments especially in mobile devices (Siang et al., 2019; tom Dieck & Jung, 2015). Young tourists have their smartphone and they use that device to interact with the environment throughout the information search stage to post purchase behavior. In this case AR can attract most of the young travelers. In a fun and engaging way, AR applications offer visitors the opportunity to get to know unknown environments. Overall, in order to create an enjoyable tourist experience, these newly developed applications aim to give tourists interesting and useful information (Jung et al., 2018). All themes regarding AR applications which are identified by the researchers of this study from extensive literature review are discussed with the stakeholders (visitors, young visitors and university teachers). Among the many tools of AR, AR mobile application seems viable to the stakeholders for this type of destination. AR mobile application is used in the People's Museum at Melaka in Malaysia and at the MUVIG museum in the Italy (Cianciarulo, 2015; Siang et al., 2019).

AR mobile application can be adopted by Bangladesh for the Paharpur Vihara. In that type of AR mobile application two important parts are integrated: (a) Development of AR mobile application; (b) Use of AR mobile application. In the first part destination authority will select objects/exhibits which will be scanned through 3D scanner to create digital versions of the objects. Then, considering the QR code a software development team will develop an AR application for smart devices like android or IOS. Finally, the app will be uploaded to the google play store. The second part is basically for the visitors. Visitors will download the AR mobile app from Google play store into their internet-enabled smartphone and activate the app. Then scan the QR code and the AR marker for watching videos with facts and figures. How the Paharpur Vihara authority can implement this type of AR mobile applications are figured out in the following:

Stage 1- Development of Augmented Reality Mobile Application for Paharpur Vihara

In the development of AR mobile application for the Paharpur Vihara, the destination authority should follow the subsequent steps:

 (i) At first selected exhibits (terracotta, statues and relics etc.) in the Paharpur Vihara have to be scanned using a handheld 3D scanner to create its virtual forms.
 (ii) Secondly, an AR mobile application has to be developed by a software team for creating AR applications for mobile devices while considering the QR code and AR marker.
(iii) Then the mobile app should be uploaded to google play store.

Stage 2- Use of Augmented Reality Mobile Application for Paharpur Vihara

In this part, the main duty goes upon to the visitors but destination authority will provide guidelines regarding the use of the AR Mobile Application for the destination. Here visitors will follow the following instructions:

(i) Visitors will download the AR mobile App from google play store into their internet enabled smartphone;
(ii) Activate the app;
(iii) Scan the QR code;
(iv) And scan the AR markers

Upon decoding the QR codes, visitors can watch videos which lead them to know more about the Vihara's exhibits and objects through display of facts and information (Cianciarulo, 2015). More delightfully, when the users scan the AR markers, they can see virtual elements being overlaid into the real world on their smartphone device. The mobile AR app helps them to communicate with old artifacts and objects and take photos (Siang et al., 2019).

Similar type of AR mobile app was used in the People's Museum at Melaka in Malaysia. For better understanding, the process of AR mobile app development for the museum is summarized in the below figure (Fig. 11.1).

User Requirement for Mobile Augmented Reality

As mobile AR is still known as a new tool in tourism industry user requirements are less identified and validated (Han et al., 2014). Past studies show that in any software and mobile computing devices user requirements are needed to be identified and validated before use (Gafni, 2008;Han et al., 2014 ; Zheng & Pulli, 2005). Previous studies proliferate the obligation to identify the user requirements for the newly developed mobile AR application. User requirements for the potential mobile AR applications should be simple with authentic user interface which indicates that software as well as the design interface will be simple (Han et al., 2014; Zheng & Pulli, 2005). The size of the software should be small and easy installation process will be required. Information should be sufficient and relevant and updated for the users of the application (Gafni, 2008;Han et al., 2014 ; Herzwurm & Schockert, 2003). Accessibility is another important user requirement for any software. The application software ought to be accessible and work on different platforms at anytime and anywhere (Han et al., 2014; Herzwurm & Schockert, 2003; Zheng & Pulli, 2005). Ease of use is a common key focus that would encourage the user to use the mobile app (Gafni, 2008; Han et al., 2014).

Now-a-days, citizens are more time-pressured than ever so the application should be efficient and less time consuming (Han et al., 2014; Zheng & Pulli, 2005). Safety and security measures must be considered in designing the application. It will not be appropriate to neglect safety and security concerns, and privacy should always be considered a priority (Gafni, 2008;Han et al., 2014 ; Herzwurm & Schockert, 2003). Product features and price are crucial factors in user requirements of any software.

Fig. 11.1 User Manual of the 'When History Comes Alive' AR Mobile App. (Source: Siang et al., 2019: p.4)

Table 11.1 User Requirements for Mobile AR. (Source: Adopted from Han et al., 2014: p.516; and focus group discussion of this study)

User requirements	Authors
Simple and authentic user interface	Gafni, (2008), Han et al., (2014), Herzwurm & Schockert, (2003) and Zheng & Pulli, (2005)
Small size and easy installation process	Han et al., (2014), (focus group discussion)
Sufficient, relevant and updated information	Gafni, (2008), Han et al., (2014), Herzwurm & Schockert, (2003) and Zheng & Pulli, (2005)
Accessibility	Han et al., (2014), Herzwurm & Schockert, (2003) and Zheng & Pulli, (2005)
Ease of use	Gafni, (2008) and Han et al., (2014)
Efficient and time saving	Han et al., (2014) and Zheng & Pulli, (2005)
Product features and price	Han et al., (2014) and Herzwurm & Schockert, (2003)
Social networking and interactivity	Han et al., (2014), Herzwurm & Schockert, (2003), focus group discussion

Therefore, in designing mobile AR application product features and its price should be considered (Han et al., 2014; Herzwurm & Schockert, 2003). It is expected that cost of using the potential mobile AR application will be reasonable. At present people expose themselves to various social networking sites such as Facebook, YouTube and Twitter (Pramanik & Rakib, 2020). Social networking becomes the new trend and obviously it's gaining the importance. As people would like to share their memorable things at social networking sites the software should have the capability of interactivity where people can watch the video, take picture with the objects and finally can share at social networking sites (Han et al., 2014; Herzwurm & Schockert, 2003). User requirements in the mobile AR can be summarized as follows (Table 11.1).

Methodology of the Study

This exploratory study focuses on implementation of AR technology at Paharpur Vihara which is a UNESCO proclaimed world heritage site in Bangladesh. At present the Vihara does not integrate any advanced tool like AR to display the objects. Written instructions through paper plaques and little descriptions on the objects are only guides for the visitors at this great Vihara. To attract more visitors, to ensure sustainability and to provide interactive experience the Vihara can be incorporated with the implementation of potential AR applications. In implementing innovations or new technological tools, it is crucial to involve the stakeholders to enhance the value and ensure effectiveness of the implementation (Hall & Bannon, 2006; Tipping et al., 1995; tom Dieck & Jung, 2017). Basically stakeholders are two types: internal stakeholders (employees, managers, owners) and external stakeholders (visitors, local community, government, suppliers, creditors) in the tourism industry

(Freeman, 1984; tom Dieck & Jung, 2017). Stakeholder approach has been taken in consideration to check the feasibility of innovation or new technological tool implementation in tourism industry (Freeman, 1984; Tipping et al., 1995; tom Dieck & Jung, 2017). This study has identified the perceptions (positive dimensions and challenges) of selected stakeholders regarding the implementation of potential AR applications at the Vihara. Through extensive literature review and discussion with experts as well as with the intuition of the researcher stakeholders of this study have been selected first. As this destination has not yet implement any AR tool, the concept of AR with written form (paper) and different video versions of AR applications in context of culture and heritage tourism were presented and elaborated to the stakeholders. After that they were asked to opine about their perceptions regarding potential application of AR at the destination. Then, qualitative data were collected through in-depth interview and focus group. The data were collected from five categories of stakeholders (officials of the destination, local community, university teachers, visitors and young visitors in between December 2019 to February 2020. After that the data were analyzed and sorted with the help of content analysis where researchers' judgment and existing literature act as a basis. Total numbers of 13 important informants were selected through theoretical sampling from the five categories of stakeholders for this study. In-depth interview with official (1), local community (3), visitors (3), and university teachers (3) were conducted rigorously. One focus group study was conducted among the young visitors (3). Summary of the methodology can be shown in the following way (Fig. 11.2).

Findings

Demographic Profile of the Respondents

This study is carried out in qualitative manner. This qualitative study has collected data from the five categories of stakeholders namely officer of the destination (OD); local community (LC), university teachers (UT), visitors (V) and young visitors (YV). From the OD category one officer from the destination was selected and in-depth interview was conducted. His age lies in between 30 to 39. From the local community category three respondents were selected and in-depth interview was directed. Both LC1 and LC2 are between the ages of 50–59 and their education level is SSC. LC3 is another respondent from the group of the local community whose age is between 30 and 39 years. Education level of LC3 is graduation. Three university teachers were selected by considering their research interest and in-depth interview was conducted. UT2 and UT3 both of their age ranges in between 30 to 39 years. UT1's age is in the range of 40 to 49 years. Three visitors from the category of visitors were selected and in-depth interview was taken. V2 and V3 both are graduates. V1's educational level is HSC and his age in between 20 to 29 years. Another special category is young visitors. Three participants were chosen from
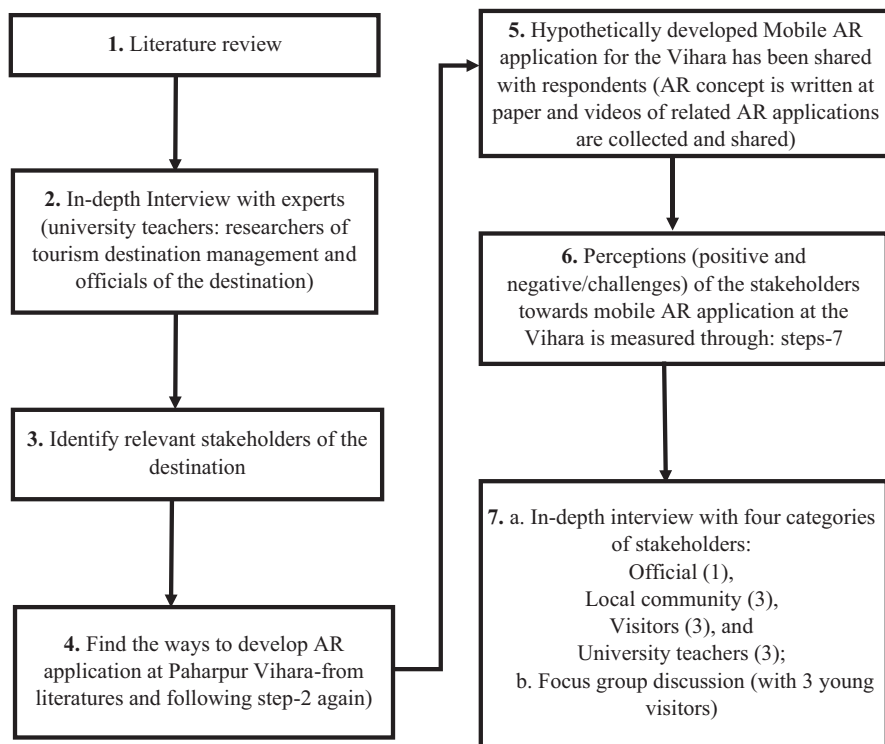
Fig. 11.2 Summary of research methodology of the study. (Source: Authors' own construction, 2020)

that category and focus group discussion was guided. The age of the three participants ranges from 20 to 29, where two are male and one is female. All of them are graduates. Brief statistics regarding the participants of this study is summarized in below Table 11.2.

Perceptions Regarding Potential Mobile Augmented Reality Application

The researchers of this study have checked the perceptions of various stakeholders towards potential mobile AR applications at Paharpur Vihara. When perceptions were measured the following statement was kept in mind. The statement was following:

Statement "Viability/feasibility (whether implementation of the potential mobile AR application is possible or not) of the potential mobile AR project at Paharpur Vihara. And what will be the perceived benefits if AR projects are implemented

Table 11.2 Demographic profile of the respondents. (Source: Authors' survey, 2020)

Sl.	Categories of stakeholders and participants	Gender	Educational level	Age	Mode
1.	**Officer of the Destination (OD)**	Male	Graduate	30–39	In-depth interview
2.	**Local Community (LC):**				
	LC-1	Male	SSC	50–59	In-depth interview
	LC-2	Male	SSC	50–59	In-depth interview
	LC-3	Male	Graduate	30–39	In-depth interview
3.	**University Teachers (UT): (faculty members whose research interest lies in tourism destination management)**				
	UT1	Male	Post graduate	40–49	In-depth interview
	UT2	Male	Post graduate	30–39	In-depth interview
	UT3	Female	Post graduate	30–39	In-depth interview
4.	**Visitors (V):**				
	V1	Male	HSC	20–29	In-depth interview
	V2	Male	Graduate	30–39	In-depth interview
	V3	Female	Graduate	20–29	In-depth interview
5.	**Young Visitors (YV):**				
	YV1	Male	Graduate	20–29	Focus group
	YV2	Male	Graduate	20–29	Focus group
	YV3	Female	Graduate	20–29	Focus group

here? What will be the obstacles in case of implementing the potential mobile AR application at the Vihara".

The researchers of this study have discussed with the respondents (among the five categories of the stakeholders) through in-depth interview and focus group discussion by considering the above mentioned statement. Actually the discussion was semi structured in nature. Respondents also shared their views beyond the statement. Important and relevant data are incorporated and irrelevant topics are drop out from the study where researchers' judgment and intuition is used. Stakeholders' perceptions (positive vs. negative), challenges of implementing the potential mobile AR applications are expressed in the following sections:

Opinions of the Stakeholder- Officials Firstly, an official of the destination was asked to express his opinion regarding feasibility of AR project at the destination. When the AR applications in context of cultural heritage tourism were presented to the officer of the Paharpur Vihara the officer anonymously said "It will provide exciting and interactive visiting experience to the visitors. It is a new technological tool that will be integrated with this destination". But he feels doubt about the implementation about the AR project at this destination because the destination suffers from the problem like negligence and carelessness. He shared his anxiety regarding the cooperation among the different departments and financial challenges to implement AR project here. Actually to implement AR project at this destination top down approach means from the Department of Archaeology (DoA) to regional authority and then to local authority directions and accordingly cooperation will be required. The official said "I am hopeful that if the top authority is informed and convinced about the benefits of the project they will take initiative to implement that type of innovative project which will ultimately revive the objects of the Vihara". Finally, he said "with the supports of government of Bangladesh it is possible to implement the AR project at Paharpur Vihahra". About the second part of the statement: what will be the perceived benefits if AR projects are implemented here? He opinioned that the precious objects of this destination will get relieves from the risk of repetitive human touch, decay or erosion. Digital version of the objects will be created. Aesthetic value of the objects will also be added.

Opinions of the Stakeholder- Local Community Local community is another important stakeholder of the destination. The researchers have also conducted an in-depth interview with the three residents of the local area of the destination. At first they could not understand the theme of the AR. After clarifying the theme of the AR they said it is possible to implement the AR project at the destination but collecting and inserting all of the information regarding all the objects will be very difficult. LC3 said that objects of this destination are historical and older also; so getting all the reliable information regarding particular object and its use at that particular time will be very challenging. He also expressed that if AR project is implemented here young generations of the country will get enough opportunity to learn about this great monastery and Pala dynasty. LC1 stated that if AR is implemented at Paharpur Vihara the more visitors will be attracted and local economy will be flourished. Another respondent from local community LC2 stated that AR application will change the adjacent business positively and that will create employment opportunity also.

Opinions of the Stakeholder- University Teachers In-depth interview from the three faculty members at university level who generally conduct research on tourism destination management are taken. All of the three faculty members shared the common challenges regarding implementation of AR project at Paharpur Vihara are: Funding difficulties, lack of coordination among different related departments and lack of concentration. UT1 indicated that getting attention from concerned authority will be challenging (Actually who will take the initiative to implement AR

at the destination?). UT2 and UT3 also specified another challenge that the integration of technology with the physical objects will require accurate and reliable information. UT3 also mentioned the challenge about language barriers. For international tourists' digital presentation of the objects should be in English and for the local the language should be the mother tongue Bangla. In developing AR applications Languages of the communication should be kept in mind by the programmers. UT3 indicated that if AR is applied in the destination many uncared (without proper care) objects will get attention. UT3 also concerned about availability of efficient manpower and technology; as the implementation of AR at this destination will requires expertise knowledge and technological knowhow of related foreign experts. UT2 said that many of the visitors may not be attracted to the AR application due to technological inefficiency. He also mentioned that it will attract foreign tourists. "Local tourists may not engage themselves to the AR applications due to their attitudinal problem and due to slow adoption rate of technology" added UT2. All three faculty members agreed that digital custody of the objects will be created and the objects of the destination will escape from the erosion, permanent losses and salinity problem. "With the application of AR, the arts, culture, traditions and practices of the Buddhists at that time will be protected and expended for the learning of the new generation"-said UT3. Regarding the perceived benefits almost all of them shared the same things. They mentioned from the AR implementation economic, social, experiential, aesthetic, and educational value will be enhanced. "All stakeholders will be benefitted from the implementation of the AR"- said UT2. UT3 also mentioned the point that AR implementation will reinforce the sustainability of the destination.

Opinions of the Stakeholder- Visitors Visitors are the central part of any destination. Actually visitors make a destination lively. The researchers of this study conducted in-depth interview with the visitors also. V1 said it will be very enjoyable and exciting. V2 stated that AR application will bring live into the deceased objects. "The visiting experience will be more interactive"- agreed by V1, V2 and V3. V1 said that many visitors will not have the ability to access into the digital application due to lack of smart device, lack of technical knowledge and so on. In this regard tourist guides and technical facilities should be made available; otherwise many visitors will become frustrated. "Especially for children and less educated people technical facilities should be ensured by the destination authority"-said V1. V2 mentioned that many objects of this destination become gloomy and unclear. If AR is applied, then the gloomy objects become transparent in digital platform. "It will enrich our memories and ensures interactive learning"-stated V2.

Opinions of the Stakeholder- Young Visitors Young generations are very much tech-friendly and technology oriented (Hence, 2018). In tour and travelling, the young generations are more interactive with technological devices like smartphone, camera and HMD (Head-Mounted Device) and so on. The researchers of this study have taken an opportunity to conduct a focus group discussion among the three young visitors (who are the university students at graduate level). In the discussion

period they were presented with different examples of AR applications in the context of cultural and heritage destination. Then their perceptions regarding AR implementation were checked. YV1 said that really it will be an exciting way of visitation and it will create strong psychological and emotional attachment. "AR implementation will attract more visitors"- Said YV2. YV2 also stated that this application will increase the curiosity among the visitors and attract new visitors. "AR application will help to learn easily and interactively"- stated YV3. All of the three young visitors said that they are very enthusiastic about the new technology like AR. They agreed that if AR is implemented, young generations will be highly attracted to this destination. "As in physical environment it is strictly prohibited to touch the objects and take picture, AR will resolve the issues at some extent" added YV3.

Through the technique of content analysis, the researchers of this study summarized all of the findings into a structured format where we can find the findings easily. The summary is shown in the below Table 11.3.

Discussion on Findings

This qualitative study has explored five positive perceived benefits which are shown by different stakeholders of the destination towards the potential mobile AR application at Paharpur Vihara. Positive perceived benefits are economic value, experiential value, aesthetic value, historical & cultural value and educational value. This study also explored some negative perceptions basically those are challenges impeding the implementation of mobile AR application at the destination. The challenges are management challenges, visitors' incapability, financial challenges and informational challenges. If mobile AR application is implemented at the destinations the visitors of the destination will get a lively and interactive environment for their visitation which actually enhances the experiential value. These findings are also supported by previous studies (Gordon et al., 2015; tom Dieck & Jung, 2017). With the implementation of mobile AR application new visitors and young visitors will be attracted and local business and employment opportunity will have flourished. That means economic value will be accelerated. This finding is matched with the findings of the prior studies (e.g.Gordon et al., 2015 ; Jiang & Kim, 2015 ; tom Dieck & Jung, 2017). Sustainability of the destination will be ensured and local culture, history and traditions will be protected (UT3). Similar findings are established at the studies of the earlier researcher (tom Dieck & Jung, 2017). Interactive learning and easy to learn will be possible with the help of AR application which indicates the enhancement of educational/learning value. Learning value is increased with the use of AR application in cultural and heritage tourism context is found in other research studies also (Gordon et al., 2015; tom Dieck & Jung, 2017). New technology will be integrated and old objects will get the newer versions in the virtual platform which will enhance the aesthetic value of the destination. AR tools also helps in modification of the objects in digital platform obviously without

Table 11.3 Stakeholders' perception dimensions and sub-dimensions with challenges and values with literature studies. (Source: Authors' survey and literature review, 2020)

Perceptions towards AR	Sub-dimensions	Stakeholders	Value	Existing literatures
Positive dimensions	Exciting	OD,V1, YV1	**Experiential value**	Gordon et al. (2015) and tom Dieck and Jung (2017)
	Interactive	OD, V1, V2, V3, YV3		
	Lively	V2		
	Enthusiastic	YV3		
	Enrich memories	V2		
	Emotional attachment	YV1		
	Psychological attachment	YV1		
	Local economy	LC3	**Economic value**	Gordon et al. (2015), Jiang and Kim (2015) and tom Dieck and Jung (2017)
	New visitors	LC1, YV2		
	Young generations	YV3		
	Local business	LC2		
	Employment opportunities	LC2		
	New technology	OD, YV3	**Aesthetic value**	Gordon et al. (2015), Jiang and Kim (2015), and tom Dieck and Jung (2017)
	Aesthetic value	OD		
	Curiosity to new technology	YV2		
	Escape from erosion	OD, UT1, UT2, UT3	**Historical and cultural value**	tom Dieck and Jung (2017)
	Digital creation	OD, V2, UT1, UT2, UT3		
	Escape from permanent losses	UT1, UT2, UT3		
	Sustainability	UT3		
	Protection of arts, traditions and culture	UT3		
	Getting attention	UT3		
	Learning	LC3, UT3, YV3	**Educational/ learning**	Gordon et al. (2015) and tom Dieck and Jung (2017)
	Opportunity to learn	LC3, UT3, YV3		
	Easy to learn	YV3		
	Curiosity to learn new things	YV2		

Table 11.3 (continued)

Perceptions towards AR	Sub-dimensions	Stakeholders	Value	Existing literatures
Challenges	Carelessness	OD, UT1	**Management challenges**	Fritz et al. (2005)
	Negligence	OD, UT1		
	Lack of cooperation	OD		
	Lack of concentration	UT1		
	Lack of efficient manpower	UT3		
	Lack of understanding	LC1, LC2, LC3,	**Visitors incapability**	Han et al. (2014) and Pang et al. (2006)
	Language barriers	UT3		
	Inability of visitors	V1, UT2		
	Visitors unwillingness	UT2		
	Funding difficulties	UT1, UT2, UT3	**Financial challenges**	Fritz et al. (2005)
	Lack of technology	UT3		
	Technical instrument supports from the destination	V1		
	Lack of reliable information	LC3, UT3	**Information challenges**	Survey
	Collecting reliable information	LC3, UT2, UT3		
	Inserting information	LC3, UT2, UT3		

compromising the original objects as it is. This finding also reveal same with the existing literatures (Gordon et al., 2015; Jiang & Kim, 2015; tom Dieck & Jung, 2017). This study could not find ecological value, functional and strategic value of AR application at a site like Paharpur Vihara although previous studies revealed such findings (tom Dieck & Jung, 2017).

Besides the positive dimensions of the perception of the stakeholders there are some negative dimensions towards the potential mobile AR application. The respondents also show the challenges that might have to be faced in implementing the mobile AR application at the destination. By classifying the sub-dimensions of negative perception four main challenges are identified which are management challenges, visitors' incapability, financial challenges and informational challenges. Implementing AR application in developing countries like Bangladesh is not easy task. Lack of cooperation and concentration from the concerned authority may challenge the implementation of AR application at the destination (Fritz et al., 2005; OD, UT1, and UT3). Visitors' unwillingness and their incapability to access modern technology may create another challenge for implementing AR at the destination (Han et al., 2014; Pang et al., 2006; V1 and UT2). Fund raising difficulties may prolong the implementation of the AR application (Fritz et al., 2005; UT1, UT2 and UT3). Getting reliable and relevant information regarding each and every object at

the destination will be very tough and become impossible in some extent (LC3, UT2 and UT3). This will create informational barriers to apply the AR project at the Vihara. Maximum studies are carried out to find out the potential benefits and very few studies are carried out to find out the challenges to implement AR application in tourism industry. Therefore, the findings of the study regarding challenges of AR implementation will act as guidelines for the destination managers, policy makers and marketers to develop and implement their AR strategies to provide exciting visiting experience.

Technology Supported Tourism Tool as Augmented Reality and Sustainability

Innovative and interesting technological applications have emerged in recent years within the tourism industry. The introduction of new technology has led to rapid and significant changes in the use, supply and conservation practices of the tourism sector, especially in the fields of culture and heritage tourism (Pietro et al., 2018; Ramos-Soler et al., 2019). In tourism, AR is a promising key contributor to sustainability (Han et al., 2014; Yung & Khoo-Lattimore, 2017). Mobile technology application in tourism industry generates creative experiences for customers, enhances a sustainable competitive advantage and brings sustainability to tourism (Kim & Kim, 2017; Koo et al., 2017). AR provides a mixing of the experience of real environment with computer generated environment to the visitors (Azuma et al., 2001; Chung et al., 2015; Kounavis et al., 2012; Milgram et al., 1995; Milgram & Kishino, 1994). Without hampering the real setting the AR applications are adopted to enhance the value of existing environment which is the main concern of sustainability. AR does not only provide benefits to the visitors it also provides benefits to the stakeholders. Local community gets the benefits of employment opportunities, development of SMEs and modern infrastructure (Han et al., 2014). AR applications brought back the historical objects, buildings, culture, traditions and customs to the real life through re-enactment of the old events and their significance (tom Dieck & Jung, 2017). With the implementation of AR technology, the digital version of a destination and its objects can be created which will actually fulfill the needs of future generation without comprising the needs of present generation, clearly fulfilling the generally accepted preconditions of sustainability. Through the capacity of enhancing experiential, economic, education, historical & cultural and aesthetic value the AR is ultimately enhancing the sustainability of the tourism industry.

Conclusion and Recommendations

In today's world, as part of their everyday experiences, travelers engage more with technological devices. In reality, this creates the basis for the expansion of technologically facilitated tourist destinations (Neuhofer et al., 2012). In order to attract visitors from home and abroad the authorities of the archeological and heritage sites require constant investment in new technology like AR into the industry. Especially the AR mobile based applications have been adopted rapidly in the cultural and heritage destinations (Fritz et al., 2005; Han et al., 2014). In this study it is found that the stakeholders have positive perception towards the implementation of potential mobile AR application at the Paharpur Vihara. The stakeholders stated that if AR is adopted at the destination the value of the destination will be enhanced through the enhancement of the economic, experiential, cultural & historical, educational and aesthetic value. The stakeholders also expressed some challenges that might have to be faced by the managers and authority of the destination to implement the potential mobile AR application. Lack of enough funding opportunities will be the great challenge as like as many destinations around the world for implementing the AR project at the destination. Proper communication among concerned authorities, government and relevant stakeholders may mitigate the financial challenge. Another challenge is management challenges which show the lack of cooperation, lack of attention to the destination from the concerned authority which may hinder the implementation of AR application. This study also reveals that incapability or unwillingness of the visitors to use the new technology will create another obstacle in implementing the AR project. Slow adoption rate with innovation in our country may prolong the acceptance time of the project. In this case at the beginning period of the implementation visitors should be encouraged and trained up through efficient tour guides. Destination authority may appoint some technical personnel to implement the AR project. Knowledgeable personnel or experts from foreign countries experienced in managing AR at heritage sites could be hired for collecting and inserting the reliable information into the objects. Although there are some challenges to implement the project at the destination but it is not impossible to apply AR projects in Paharpur Vihara because of its promising future. The AR tool has high potentiality in tourism industry due to its practical usefulness and benefits. In near future it will be used extensively in the tourism industry to offer exciting and lively environmental setting with real world to the visitors. In future the AR will bring many new features to it users also. As interest towards AR is growing Brain-Computer Interfaces (BCI) and nanotechnology applications with AR will be used in future. AR will become wearable devices (Loureiro et al., 2020). In future the AR will be used as a strategic tool for planning, managing and promoting the tourism industry of Bangladesh.

Limitations and Future Research Directions

With in-depth interview and focus group discussion, this qualitative study was carried out where only thirteen participants from five stakeholder groups were selected. The respondents are very small in number. Only one respondent was taken from the category of official of the destination, while this study may include more concerned authorities of the destination in the study. In the study the authors found no implementation of AR application at the destination. But this study has carried out to measure the perceptions of the stakeholders towards the implementation of potential mobile AR application with the help of hypothetical or simulated mobile AR application which may not reflect the actual representations. In the future, the perception of AR applications can be assessed by practically applying the AR application on a limited number of objects at the destination. Quantitative studies can be conducted by taking into account all the dimensions and sub-dimensions of the perceptions of mobile AR application identified by this survey. Besides, due to differences in gender, educational level, age group and types of stakeholders, perceptions reflected in this study of AR applications may differ.

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Chapter 12
Technology Application for Visa and Immigration for Tourists in Bangladesh

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Abstract The tourism industry is one of the largest industries in all over the world. It has become a large source for generating revenues and earning foreign currency. Information and communication technology (ICT) has made the world travel and tourism easy and interesting. Tourists from all over the world are traveling easily with the help of the advancement of Internet technology. It plays an important role in the tourism industry. Visa and Immigration system in many countries have become online for making the travel easy and available. Without adopting information and communication technology, such automation cannot be possible. It is very utmost important to implement modern technology in this industry. For the purpose, Bangladesh government has taken many initiatives to make Visa and immigration systems online. Bangladesh is focused on using and developing ICT for the implementation of its national vision. It will bring more tourists from the international arena as well as Bangladeshi tourists can enjoy overseas attractions. This chapter emphasizes on technology adoption for the Visa and Immigration system for tourists in Bangladesh, identifies some challenges, and finally suggests some initiatives to overcome such challenges.

Keywords Tourists · Technology · Visa and immigration · The Internet · Bangladesh

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Introduction

At present, the Internet is said to be the key medium to obtain data and information about tourism services where such resources can be both created and maintained by the web editor with the support of a forum or community members (Berger et al., 2007). Tourist information dissemination is generally originated from the pre-decision experience stage. Conventionally, this dissemination initiates with the product's relevant materials (i.e. illustrations, presentations, catalogues, maps etc.) and the media content. Innovative technologies can offer newer elements to transmit information from diverse places without considering distance or time gaps (Najafipour et al., 2014).

At present, the innovative features of technologies in tourism has become more effective and resourceful with the support of 5G Internet. These technologies show promises for faster loading and downloading speeds, wider coverage, more stable and reliable connections. Apart from all these features, 5G makes downloading 20 times faster than ever before and allows for developing and deploying the better functioning of the Internet based activities. All of these features commonly lead to more efficient connections between the tourists and the Smart devices where tourists become abler for starting enjoying the Internet of Things (IoT).

Tourism and Mobility

Mobility of the tourists is essential in tourism. According to UNWTO (2013) and WTTC (2013), the UN Conference on "International Travel & Tourism" was held in 1963 in Rome and this conference was attended by representatives of 87 states and agreed that "Governments should extend to the maximum number of countries the practice of abolishing, through bilateral agreements or by unilateral decision, the requirement of entry visas for temporary visitors". Visa policy should be easier to influence international tourists for a nice travel.

There is positive relation between tourism and mobility. It is a dynamic and potential industry. Tourists prefer to travel and want to explore. In its simplest form, "travel" denotes to go on a journey or the movement from one place to the other.

The related term, "transport" generally denotes to how people change their position from one corner to another one, and people have different views for their travel and it is different from different age group (Dickinson & Lumsdon, 2010). It has different connotations. It may be also virtual, using online media platforms. Getting a phone call might transport a user to another residence, even when directed in a very public or crowd place. Also, the "new mobilities paradigm" (Sheller and Urry, 2006) places social networks and the drive of "people, objects, ideas and information center stage".

There are five interdependent mobilities: "physical travel of people, physical movement of objects, imaginative travel, virtual travel and communicative travel"

(Larsen et al., 2006, p. 4). As Lemos (2010, p. 404) suggests "now we have the possibility to move physically/spatially and virtual/informational at the same time". This is one of the most valid concepts in travel and tourism industry. Mobility emerges as one of the central issues that includes components of space, place and environment (Hall & Page, 2009).

Tourists enjoy traveling in many purposes. There are many different types of tourism. Today's tourists want to explore various attractive spots. Technology is helping these tourists to visit different corners of the world. In that case, globalization plays a critical role in growing mobility through the affecting the individuals' backgrounds and the overall systems (Bauman, 1998). Due to globalization, the world has become a village and people can move from one corner to other corner easily. It has become possible due to the access of the Internet and communication technology. Developed countries are developing their tourism industry by utilizing the proper use of information and communication technology. They are earning huge foreign currency from this industry due to implementation of the Internet technology in tourism industry.

Tourists' Mobility and Information and Communication Technology Information Technology

According to Buhalis (2003, p. 7) "Information and Communication Technology (ICT) is as the entire range of electronic tools, which facilitate the operational and strategic management of organizations by enabling them to manage their information, functions and processes as well as to communicate interactively with their stakeholders for achieving their mission and objectives". On the other hand, the Internet is featured as one the most significant innovation after the invention of printing press (Hoffman, 2000). The Internet is such a technology that is not only able to change the ways individuals' interaction with each other but also has modified the human beings' societal roles (Barwise et al., 2006). ICT has integrated into the daily lives of the people and tourists are not an exception (Wang et al., 2016).

Buhalis and O'Connor (2005) pointed out over a decade ago that technologies on ambiance and intelligence will gradually become the focal point of technology developments in tourism. Such technologies (i.e. embedded systems, media management and handling, sensor technology, ubiquitous communications, natural interaction etc.) as the cutting-edge technologies bring-in innovative ways for controlling and monitoring tourism and hospitality businesses. The Internet of Things (IoT) and the Internet of Everything (IoE) are believed to have revolutionized and reengineered business processes that can effectively disrupt the hospitality industry (Porter & Heppelmann, 2014).

In the last few decades, ICT has been playing crucial roles in the tourism and hospitality industry. The important concern is that the application of innovative technologies is helping to reduce costs, efficiency enhancement of operational

activities, the betterment customer service and experiences. This application of innovative technologies can be effectively supported from communication, reservations, and guest service systems. As a result, technology has literally supported the tourism and hospitality industry to replace the expensive nature human labor with digitalization aiming not only to reduce costs and time but also to avoid issues attached to offer customer services. ICT plays more strategically in trade and commerce industry and these countries are getting benefit mostly from it. It has made the commerce industry easy and profitable.

In this setting, the rapid growth of the ICTs has shaped not only innovative marketing styles but also new dynamic tourist profiles. Modern trends of business and tourism policy have reached in a new milestone due to the development of the Internet and information and communication technologies. Tourism operators change their policy frequently for the advancement of ICT industry in all over the world.

ICT has been supporting for increasing effectiveness of the tourism industry and destinations as well as the globalization of this industry through providing different tools that help to develop cope and allocate offerings around the world. In the similar manner, ICT can present the utter transparency in the marketplace by empowering consumers for identifying, customising and purchasing tourism and hospitality products (Sinha et al., in press).

Different innovative technologies are applied in the tourism industry. Very specially, B2C is also playing a significant role where tourists can book hotels and motels very easily from any corner of the world. ICT use is becoming gradually noteworthy for tourism destinations, mainly for those seeking to appear as more economical (Buhalis & Licata, 2002). Such trend is not only applicable to the tourism industry but also to many other industries (Gretzel et al., 2000).

The ICT Development Index (IDI) of the International Telecommunication Union (ITU) is a useful tool for the status of Information Society (Table 12.1).

Hjalager (2002) has segmented tourism innovations into "product, process, management, logistics and institutional innovations". More specifically, Williams and Shaw (2011) defined markets, knowledge transfer, and production conditions as critical elements for tourism innovation.

Table 12.1 ICT Development Index (IDI) (source: The Daily Star, 2015)

Country	2013	2012	2011
Afghanistan	155 (score 1.67)	155	N/A
Bangladesh	145 (score 1.97)	146	139
India	129 (score 2.53)	129	120
Nepal	131 (score 2.37)	134	N/A
Pakistan	142 (score 2.05)	141	128
Bhutan	123 (score 2.85)	126	117
Sri Lanka	116 (score 3.24)	113	107
Myanmar	150 (score 1.82)	148	N/A

Furthermore, Makkonen and Hokkanen (2013) have explored positive relationship between ICT innovation and the way within which tourism influences economic development. Furthermore, as a result of the advancement of modern technology, tourism costs are now lower than they were previously (Aldebert et al., 2011). These incipient enhancements have altered the overall structure of tourism items, including distribution networks, and have aided in the removal of existing roadblocks to excellent service at various destination levels (Berne et al., 2012).

Tourists' Mobility and eTourism

Tourism industry has been changed dramatically due to update technology and businesses are becoming more competitive. In addition, the opportunity of tourism business is also expanding (Porter & Millar, 1985). In competitive world, every country would like to enjoy competitive advantage in tourism industry so it must be kept in mind that it would be possible due to adoption of technology. It will also help to reduce cost as well.

The definition of eTourism in question is the use of information and communication technology (ICT) to improve tourism quality, provide a variety of tourism services to tourists, and make tourism marketing more available through Telematics (Condratov, 2013; Lumenta & Sugiarso, 2015). The growth of eTourism is linked to the development of ICT. ICT is a technology that uses computers and telecommunications to procure, process, store, and disseminate different forms of information in order to resolve the slowness of human information processing. ICT domains, as special headquarters for instruments with diverse series and services, promote interaction between market participants and global markets, while eTourism domains established technological innovation and its effect on the tourism market (Condratov, 2013). eTourism, which includes major Internet distribution platforms for marketing, business, and tourism, has also influenced the use of ICT and how to influence the tourism industry's growth (Lumenta & Sugiarso, 2015). Social networking, websites, mobile apps, blogs, and other forms of eTourism are all included in this category.

One of the most cited definitions on eTourism is "eTourism reflects the digitalization of all processes and value chains in the tourism, travel, hospitality and catering industries" (Buhalis, 2003: p.76). The system of eTourism comes with the electronic distribution of tourist information on services and products that exerts considerable influence on contemporary consumer behavior. This eTourism system is followed by the transformation of a general tourist to an e-Tourist. On this basis of eTourism features, several research studies have explored the factors and determinants, identify consumers' apprehension and behavior towards eTourism services (Bajpai & Lee, 2015) coupled with their protection while purchasing online travel products and services (Nedelea & Bălan, 2010).

eTourism is a digital network that allows users to manage news, activities, and destinations (Lumenta & Sugiarso, 2015). Similarly, with CBT, handling the

eTourism. CBT appoints representatives to oversee the digital site, which is constantly updated with news, activities, and tourism destination profiles. CBT uses eTourism to add, modify, and remove information. CBT easily adopts eTourism. Yu et al. (2017) found that ICT adoption behavior is linked to task characteristics in their study. Users are more interested in using ICT media features if they are better at performing communicative tasks. Contact is more frequent with complex tasks; additionally, the more diverse the ICT content media, the greater the impact of content on ICT adoption actions. The eVisa framework would aid in the growth of the global tourism industry.

Enabling Technologies

Seven main technological progressions strengthen current service innovations that can impact firm–customer communications with implications for service management and marketing. These are "fifth-generation mobile network (5G); artificial intelligence (AI); radio frequency identification (RFID); mobile devices, smartphones and wearables; applications or apps (along with APIs), cryptocurrency and blockchain". 5G as the fifth-generation mobile network is termed as the "wireless telecommunications system" (enhanced mobile broadband, EMBB). The large volumes of data (gigabytes) transmission across the network is essentially influenced the speed of 5G. This offers a useful infrastructure for interconnectivity, ambient intelligence and the Internet of Things (IoT) (Palattella et al., 2016).

Mobile Technology

Tourists can enjoy anything by using the mobile apps. They can make their own plan and set their goals using these apps. These types of apps are helping the tourists to save their time and costs. There are many mobile apps available for tourists. These mobile apps include destination guides, attraction guides, flight trackers and even apps from online travel agencies. Tourist experiences are effected by mobile technologies and particularly Smartphones and the ways through which firms tend to communicate with their clients.

The Use of Smartphone in eTourism

Earlier research studies on mobile technology and tourism largely covered the introduction of diverse mobile applications for travelers (i.e. mobile tour guide et.) and to test the usability of such applications for their users (Modsching et al., 2007). The introduction of Smartphone in the market demonstrates the persistent development

in tourism-based apps. As a result, the most recent research studies have also initiated for focusing more on many different application of Smartphones for tourism followed by their influences on the diverse aspects of tourism experience (Wang & Xiang, 2012).

eVisa and eTourism

The concept of eVisa (hereafter, eVisa) is defined as "an electronic alternative that travellers can use as a quicker alternative to traditional travel visas issued by a nation's embassies, consulates, or missions or at ports of entry" (Ministry of Foreign Affairs, 2020). According to the data provided by UNWTO (2013) concerning visa facilitation between 2010 and 2012, many destinations have revised their visa policies from a 'visa required' status to eVisa, "visa on arrival" or "no visa required". Currently, most tourism policymakers are aware of tourism destination and realized the importance of eVisa and eVisa facilitation is playing a vital role to attract more tourists and the economic benefits generated by removing strict visa regulations (Song et al., 2012). eVisa facilitation can improve for the interests of tourists'. Moreover, the benefits of eVisa can enjoy not only tourists but also help to contribute to the economic development of any country.

In recent years, scholars have identified the role of innovation in tourism industry and policy makers are trying how to make eVisa easy (Pikkemaat & Zehrer, 2016). However, it is not getting more concentration compared with manufacturing industry (Weiermair, 2006). Tourism destination and policies should be customer oriented due to the factors of globalization and intense competition all over the world. New products and services must be offered to make the eVisa effective (Halkier et al., 2014).

In the last few decades, the tourism industry witnessed a rapid and unprecedented rise of tourist number. This rise is mainly owed to technological advances, enhanced mobility and more affordable travel. Before the COVID-19 years, on average more than 1.5 billion people used to cross borders for leisure or business, and billions more people travel domestically per year (WTTC, 2020). The interests of people to travel continued even with strains geopolitical instability, political risks, pressure from outdated systems, stringent security checks and processes. WTTC (2020) also affirms that improved visa facilitation with the placement of innovative technologies (i.e. biometrics, thermal scanning etc.) can be continued for driving economic growth and job creation. This can also address security concerns for ensuring that travel is safer, more secure and seamless.

eVisa facilitation is now viewed as one of the key strategies for removing obstacles. The reason is that this allows travelers for obtaining permission for visiting destinations from the comfort of their own residences. Moreover, eVisa systems can help the international tourists to travel easily. It will reduce the overloaded work from the tourists. It is high time now for Bangladesh to enter in this industry by adopting modern technology.

System's ability to adapt to different approval cycles:eVisa approval cycles differ from one country to another. Some states have two levels of approval; others can have up to four. The visa types and request conditions can also vary from one country to another. You can find single or multiple entry visas for different durations.

Ability to support different types of authorizations:

The electronic visa system must support different types of authorizations such as work permit, resident permit, student visa and more.

Ability to integrate third parties: The system should also adapt to situations where the application is made by a third party and not the traveller. Indeed, in many cases, the visa request is made by an agent or a

Fig. 12.1 Three factors to consider for online visa application. (**Source: Thalesgroup,** 2020)

To capture the tourism market, eVisa application will play a vital role. The system will bring positive feedback in tourism industry in future.

eGovernment is defined by the Organisation for Economic Co-operation and Development (OECD) as the use of "information and communication technologies, and particularly the Internet, as a tool to achieve better government" (OECD, 2003, p. 23). Its main aim is to strengthen public institutions' effectiveness and performance, as well as their relationships with residents and other stakeholders. In the most recent period, Kalbaska and Cantoni (2018) proposed the first model of governmental relationships within the tourism industry. These authors have interpreted the positions of major stakeholders in the tourism industry, with a focus on their use of ICTs in various forms of government activity: "government-to-government, government-to-citizens, government-to-businesses, government to-non-profit organisations, government-to-employees and government-to-visitors". eVisas issued by governments to foreign travelers fall under the "government-to-visitors" classification in this system. Informational programs explaining how to travel around a country are included in government-to-visitor services.

There are three key factors when introducing an online visa application as above (Fig. 12.1).

Bangladesh and eVisa

The development of technological advancement has initiated many changes in human communication such as; uses of the Internet, uses of mobile phones, transportation networks, new information systems and air travel are some examples (Allon et al., 2008). There are some countries who use update technology in their tourism industry. For example, Japan, Malaysia, Singapore, Dubai have already implanted new technology for making their visa system easy and available.

Bangladesh is an astonishingly beautiful country in South Asia. There are many beautiful site seeing places in Bangladesh. It has also many natural and

archeological attractions. There are some UNESCO World Heritage Sites in Bangladesh – "The Sundarbans and Bagerhat". This forest has a lot of attraction spots and it is considered the largest mangrove forest on earth. On the other hand,

Bagerhat is a historical city and full of astonishing mosques. Along with Bangladesh has many beaches, among them Cox's Bazar is the world largest sandy beach in the world. Tourists from different corners come to enjoy the amazing beach. The rate of tourists will increase more if the visa rules can be online and flexible.

The exact extent of Digital Bangladesh (DB) is still unknown. The government is thought to want to make Bangladesh completely digitized by 2021 by implementing third-generation ICT (The Daily Star, 2009). After 50 years of independence, Bangladesh wants to achieve its vision 2021 by fully implementing digitalization in all sectors and aspires to be a middle-income country with stability, prosperity, and dignity by 2021. Bangladesh's government has already completed a variety of projects involving emerging technology, and more are in the works. The "National ICT Policy-2009" was created with the aim of elevating the country to middle-income status by 2021 and developing status by 2041 (The Daily Star, 2015).

The goal of digital Bangladesh is to make everything online. So it will help to make visa and immigration system online very faster.

According to the Business Standard (2020), the Henley Passport Index is released quarterly that ranks the passport power of a country on the basis of the number of countries when a country's passport holder can travel without requiring a prior visa. In the top ten list, Japan secures the top place for the third consecutive year and this country's passport holder can travel to 191 countries without visa. The second position is occupied by Singapore with a score of 190 meaning that the holders of this country's visa can travel visa free to 190 countries. Following the Henley Passport Index, the power of Bangladeshi passport has improved by one notch to the 98th place in 2020 from 99th in 2019. Thus, the Bangladeshi passport holders can travel without visa to 41 countries.

According to Wikipedia (2020), for Bangladesh, visas are issued by its diplomatic missions located across the world, and when applicable, on arrival in Bangladesh. After meeting the necessary conditions (i.e. traveling with an eligible passport; having a return/onward air ticket or international train ticket or international bus ticket; if entering Bangladesh by air, road, or sea but not on a train; and carrying US $500 in cash/credit), both genuine tourists, investors, and business travelers in Bangladesh can get a Visa On Arrival (VoA) in Bangladesh. Fees for VoA needs to be paid only in cash in Euro or US Dollars at the time of entering Bangladesh. At present, this type visa fee is €51 or US $51 after the inclusion of all taxes. A single entry VoA's maximum duration is 30 days that can be extended up to another 30 days. For this extension of the VoA, applicants can apply for the extension up to a week prior visa expiry but not sooner. The extension of this visa type is available at the Department of Immigration and Passports, West Agargaon in Dhaka. Most of the diplomats get a VoA in Bangladesh while traveling with a diplomatic passport.

Some specific countries welcome Bangladeshis without a visa. Travelers can have visa on arrival in 17 countries and get e-tourist visa for Sri Lanka. Bangladeshi people actually travel to countries like Bahamas, Fiji, Indonesia and the British Virgin Islands without visa. According to Henley Passport Index 2019, Bangladeshi travelers can travel to 40 countries with visa-free access. Travelers can have visa on arrival in 17 countries and get e-tourist visa for Sri Lanka. People of Bangladesh can pick any of these countries and just go there. Bangladesh, among the countries, with the least visa-free access while countries like Japan, the United Kingdom, and Switzerland are in the top list of this index (The Business Standard, 2020).

Present government has taken many initiatives to make every industry digitalized and they are trying now to provide ePassport to the citizens of Bangladesh. ICT department can play an important role in making ePassport and eVisa. It will help the tourists to visit in any corner of the world very easily. So the rapid development of the Internet and ICT has allowed a new style of marketing to develop tourist profiles. Such trends are actually benefited from the facilities of online booking that generally result to tourism products' increased direct sales. Following the emergence of ICTs, the competitive advantages feature is changed for the vast majority of industries. Most of the developed countries have granted eVisa to attract more international tourists. So, proper measures should be taken very quickly to make the tourism product affordable and accessible along with the help of ICT. The use of ICT becomes increasingly important for tourism destinations, especially for those seeking for becoming more competitive (Buhalis & Licata, 2002).

Bangladesh can earn huge foreign currency from the tourism industry and it will be possible it technology is implemented in a proper way. eVisa facilitation can foster the demand of travel and tourism by removing bureaucratic elements that are derived from conventional visa procedures. Also, eVisa has lower processing costs through the use of automatic grants and a reduction in paperwork and manual handling of applications and can help the overall system easy and faster. With eVisa, tourists will not have to consume more time and it can help them travel trouble-free. Also, this it can reduce the overall cost through proper application of technology. The system can help to gain competitive advantage over the competitors and it can bring new cultures and system.

Conclusion

This research is designed for exploring the applicability and significance of eVisa-system in the background of ICT. Finding of this study outlines that eVisa facilitation can support and motivate tourists for traveling by removing both non-physical and physical obstacles. The adoption of ICT and eTourism can bring more positive changes for Bangladesh tourists in terms of eVisa. Findings suggest that the introduction of eVisa can contribute not only in the economic development but also in the overall sustainable development in Bangladesh. Lack of primary data was a

limitation of this research and hence, future research studies need to incorporate more on technology adoption for visa and immigration for tourists in Bangladesh.

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Part IV
Role Analysis of the Public and Private Institutions

Chapter 13
Application of Innovative Technologies in the Tourism and Hospitality Industry of Bangladesh: Role Analysis of the Public and Private Institutions

Khokaneswar Tripura and Md. Ashikur Rahman Avi

Abstract The effectiveness of technology applications in the tourism and hospitality industry is well recognized all over the world, but the role of public and private organizations associated with the industry is not clearly visible in applying technology. This chapter explores the role of the organizations (both public and private) in technology application in the industry in the context of a developing country namely Bangladesh. In doing so, this chapter provides a detailed perspective on innovative technology by reviewing and analyzing a range of scientific journals, books, publications from the leading organizations of tourism and hospitality, newspaper articles, and website information. It is found that tourism and hospitality institutions of Bangladesh can play a vital role in applying innovative technology in many cases like marketing and promotions of tourism and hospitality offerings, ensuring the safety and security of tourists, delivering quality services, disseminating necessary information, managing tourists or guests, assuming tourists' perceptions, providing training to employees, building employee capacity and so on. The study is expected to help the key policy-makers and planners, all public and private institutions as well as all service providers of Bangladesh in applying innovative technology effectively in the tourism and hospitality industry.

Keywords Technology · Tourism · Hospitality · Institutions · Bangladesh

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Introduction

The vast development of Information and Communication Technologies (ICTs) in the last few decades has significantly affected the tourism and hospitality industries (Law et al., 2014). According to Khatri (2019), the application of innovative technological devices and systems has developed substantially in the tourism and hospitality industry throughout the world not only due to providing efficient touristic services but also surviving the tourism and hospitality businesses in the competitive market environment. During the early days before the introduction of Internet technology, Computerized Reservation System (CRS) and Global Distribution System (GDS) technology contributed to the growth of both tourism and hospitality operation and helped employees to work easily reducing the difficulty of time consumed manual tasks i.e. reservation of airlines and hotel accommodations (Buhalis, 1993). Day by day the use of ICTs in strategic tourism management is becoming more necessary (Sheldon, 2004).

The emergence of internet and application of innovative technologies has enabled the tourism and hospitality organizations to make convenient their daily activities like room booking, maintaining interdepartmental communication, ensuring safety and security of employees, guests, and properties, managing resources, linking between developed system and functions, and so on (Buhalis, 2003; Sheldon, 1997). Today, the use of the Internet and Website has become a very common thing for most of the tourism and hospitality affiliated organizations to help tourists and guests purchase decisions providing authentic and reliable information (Rasoolimanesh et al., 2019; Mistilis et al., 2014). The application of technology Web 2.0 has brought a dramatic change in searching information and choosing destinations by which a great amount of information is easily accessible for the tourists (Lo et al., 2011; Rodriguez et al., 2012).

Besides the application of the Internet and website, now different types of innovative technologies are also applied in the field of tourism and hospitality around the world (Rasoolimanesh et al., 2019). Nowadays, the application of Robotics, Machine Learning (ML), Virtual Reality (VR), Augmented Reality (AR), Wireless Technologies, Biometric Analysis, Artificial Intelligence (AI), self-service kiosks, Information System (IS), Social media applications e.g. Facebook, Twitter, TripAdvisor, etc. in the tourism and hospitality industry is a demand of modern technological era (Rasoolimanesh et al., 2019; Buhalis, 1993; Buhalis and Foerste, 2015). Moreover, some additional digital technologies such as big data technologies, cloud services, Internet of Things (IoT), Internet of Everything (IoE), and Mobile Technologies (MTs) are also applied in the Tourism and Hospitality industry across the world (Buhalis, 2020; Morozov & Morozova, 2015, 2020). Though the effectiveness of these technology applications in the tourism and hospitality industry is well recognized all over the world, the role of public and private organizations associated with the industry is not clearly visible in applying technology. This chapter explores how tourism and hospitality associated public and private

organizations can play role in applying IT in the context of a developing country, Bangladesh.

Innovative Technology Applications and Changing Roles of Tourism and Hospitality Organizations

Innovative technologies work as the driving force for tourism development and competitiveness (Buhalis, 2000; Gretzel & Fesenmaier, 2009). Similarly, Buhalis and Law (2008) argued that the advancement of innovative technology redefines the tourism industry and defines the policy, approach, and competitiveness of both tourism destinations and organizations. Considering the impact of technology on tourism, Poon (1993) anticipated that no organizations associated with this industry will be able to escape the effects of the technology. Again, according to Poon's prediction many tourism organizations had to reshape their strategic management as well as marketing, and organizational techniques to enjoy the full advantage of technology (Buhalis, 2020).

During the pre-Internet era, organizations associated with tourism such as Destination Management Organizations (DMOs), travel agencies, etc. were fully depended on traditional, high-priced and time-consuming processes to communicate with their customers, and hospitality firms manually performed their business functions (guest bookings, registrations, and check-in/out, and interdepartmental communications, etc.) with no technical assistance and that was very labor-intensive and inefficient (Rasoolimanesh et al., 2019). But during 1990 to 2005, the Internet networking and communication era of e-Tourism empowered tourism and hospitality-related organizations to develop their Web 1.0 appearance with the help of websites as well as electronic commerce (Buhalis, 2003; Qi et al., 2008; Buhalis & Law, 2008; and Law et al., 2010); after that during 2005–2015, the massive development and vast use of social media platforms, initial use of mobile phone or smartphone software applications familiarized the Web 2.0 simplifying the communication of all users and enabling many-to-many engagements (Buhalis & Law, 2008; Egger & Buhalis, 2011). After 2015 to now, the Semantic web (Web 3.0) and application of a range of innovative technologies such as AI, AR, VR, cashless payment, IoT, wearable devices, voice technology, biometric recognition technology, etc. are propelling a tremendous modification in the tourism and hospitality industries around the world (Buhalis, 2020).

Furthermore, Ambient Intelligence (AmI) technologies including the IoT, the Internet of IoE, fifth-generation network (5G), Radio Frequency Identification (RFID) technology, mobile or smartphone devices, wearable devises, three dimensional (3D) printing, software apps with Application Programming Interface (API), Blockchain and digital currency, sensor and beacon infrastructures, advanced computing, gamification and augmented technical functionalities enabled by ML and

AI, etc. are expected to revolutionize the future (2020–2095) of tourism and hospitality industry (Tussyadiah et al., 2018; Buhalis et al., 2019).

The technological innovations bring all stakeholders together in tourism service ecosystems and the AmI brings intelligence to tourism ecosystems (Buhalis, 2020). To be able to serve the offerings to the target markets, increase efficiency, achieve maximum competitiveness, enhance services, and secure long-term growth for them and the destinations, tourism companies need to recognize, transform and implement innovative technologies in the strategic way (Buhalis, 1998a). Buhalis and Law (2008) also argued that tourism organizations need to accept the changes brought by innovative technologies and create highly customized offerings to meet the unique needs and requirements of the tourists.

So it is evident that tourism and hospitality organizations involved in the tourism ecosystems must have to play a completely new role in the upcoming years for re-engineering their operations to reshape products, actions, processes, and services in real-time to cope with the emerging technological innovations. Depending on the newly available innovative technological tools, the whole business systems re-engineering redesigns both inter and intra organizational frameworks focus on improving the full range of functions, and enables organizations to accumulate superior business position and surmount long-term threats (Buhalis, 1998a).

Role Analysis of Public and Private Institutions in Applying Innovative Technologies in the Tourism and Hospitality Industry of Bangladesh

This section attempts to analyze the role of public and private institutions in applying innovative technologies in the tourism and hospitality industry of Bangladesh. Before analyzing, the actual role of the public and private institutions associated with tourism and hospitality industry is explored to create a link among the public, private institutions' role and technology application; and then, how the public and private institutions can play role in applying IT in tourism and hospitality industry of Bangladesh is described which are following:

Role of Public and Private Tourism and Hospitality Institutions

A comparative analysis conducted by Choy (1993) identified that 'the core activities of National Tourism Organizations (NTOs) are coordination, legislation, promotion, research and providing information to the tourists but to meet the changing situation of a tourism destination, a NTO should adopt alternative roles, for example developmental, marketing, management and innovative, consistent with a destination's growth pattern'. Choy (1993) also mentioned that national organizations

provide tourist facilities and services, and for developing and facilitating tourist services, they collaborate with the private sector effectively, and besides, some NTOs concentrate on marketing activities besides their other responsibilities. According to Pearce (1996), the national tourist organizations are responsible for some functions such as planning and marketing, research and development, visitor servicing, lobbying or regulation, etc. Lavery (1992), Morrison et al. (1995), and Formica and Littlefield (2000) recognized and highlighted the tourism promotional role of NTOs. In this vein, Elliot (1987) and Choy (1993) also added that when the private sector of a country is capable of promoting their destinations, NTO can concentrate on playing a vital role for tourism management like meeting the tourist expectations based on their demand collaborating with other departments and ensuring maximum benefit of tourism reducing the probable adverse effect of tourism.

Whereas, in defining the role of private institutions in tourism planning and development, Stainton (2020) argued that private tourism institutions provide an environmental setting for discussing and resolving common problems associated with tourism enterprises, make coordinated recommendations to the government tourism bodies for the developments of the tourism industry, provide representation on tourism boards and committees; conduct research, invest in marketing and training related to the private sector, sometimes sponsor special tourism events, and work with local government linked to tourism.

How the Public and Private Tourism and Hospitality Institutions of Bangladesh Can Play a Role in Applying Innovative Technologies

Most of the research conducted by the top scholars around the world shows that innovative technologies have mostly affected the marketing and distribution of tourism products (Buhalis 1998a, b; Alford, 1999; Standing et al., 2014; Huang et al., 2016; Dadwal & Hassan, 2015; Sastry & Sushil, 2018; Marasco et al., 2018; Entre, 2018; Barrett, 2019), hospitality offerings (Šerić et al., 2014; Hanks et al., 2016; Bowie et al. 2016; Williams & Levitt, 2019), and operational functions (Hassan, 2018) of both the private and public institutions affiliated with the tourism and hospitality industry.

Also, the application of Information Technology (IT) in analyzing behavior and performance pattern is another essential area in the tourism and hospitality industry which includes forecasting browsers, purchasers, employees' behavior, assuming tourist perceptions, as well as identifying travelers' activities (Cheng & Cho, 2011; Wu et al., 2013; Choi et al., 2018).

It is also found that the technological application such as Robotics and web-based Self-Service Technology (SST) has great influence in managing the operational process and building employees' capacity in the tourism and hospitality industry (Noone & Coulter, 2012; Lee, 2016). Even, digital technology is playing a

significant role in providing training to employees engaged in the tourism and hospitality industry as argued by Morozov and Morozova (2020).

Besides, social media applications are commonly used in tourism and hospitality industries as a part of marketing strategy to attract guests providing necessary information including offers, packages, and the feedback of the guests through social media is also considered as the quickest way of developing and delivering customer service (Leung et al., 2013; Ye et al., 2009; Viglia et al., 2016; Rasoolimanesh et al., 2019). Similarly, Vu et al. (2020) mentioned that the Venue Referenced Social Media Data (VR-SMD) application is extensively used in the industry.

In addition to these technology-affected fields, innovative technological devices and systems significantly contributed assuring tourists' or guests' safety and security (Hotel Management International, 2015; Neal, 2018; Top Hotel News, 2018; Myers, 2019; Alice, 2019; Nandi, 2019), enhancing satisfaction (Cobanoglu et al., 2011; Neuhofer, 2014, 2016; Kyatham, 2020) and managing visitors (Tan & Law, 2016; Terschuren, 2020; Hughes & Moscardo, 2019).

So, in the context of the above discussion, it can be said that the public and private tourism and hospitality institutions of Bangladesh can play an effective role to apply innovative technologies particularly in the field of marketing and distribution of tourism and hospitality offerings, institutions to automate functions, in assuring tourists or guests' safety and security, enhancing satisfaction, and managing guests or visitors.

In Bangladesh, both public and private tourism and hospitality bodies can enhance their performance by stimulating strategic digital marketing and management efforts with the help of advanced innovative technological devices and systems. As the national tourism organization of Bangladesh, Bangladesh Tourism Board (BTB) is responsible for the marketing and promotion of the country's tourism products (Muneem et al., 2019) and Bangladesh Parjatan Corporation (BPC) is assigned the duty by the government to develop tourism. BTB uses websites, different tourism fair participation, social media posting, etc. to promote tourism (Muneem et al., 2019). From the private sector, many travel agents and tour operators sell and promote their packages using technological innovations relying especially on internet web and social media platforms (Howlader, 2018). But these public and private tourism bodies of Bangladesh can use AR, VR, IoT, IoE technologies to undertake all their promotional and operational functions as the application of AR and VR technology is effectively used as a marketing and promotional tool in the tourism and hospitality industry (Jung et al., 2015; Hassan & Rahimi, 2016; He et al., 2018; Hassan & Jung, 2016) and the application of IoT and IoE has rapidly gained ground in the tourism and hospitality business (Buhalis & Amaranggana, 2013; Tribe & Mkono, 2017; Buhalis, 2020). In this notion, Buhalis (1998b) argued that tourism organizations can improve their performance by uplifting their strategic administrative and marketing activities by utilizing innovative technologies and application of this result in improving their communication and finally improve the virtual presence.

The tourism and hospitality institutions of Bangladesh can also play an influential role in applying Mobile or Smartphone-based technologies in their field.

Rasoolimanesh et al. (2019) argued that the application of Mobile or Smartphone-based technology in tourism and hospitality industry has increased around the world and it is also found that most of the tourism and hospitality organizations have already introduced their software applications through which guests can easily contact with the service providers, receive services, and buy products as ICT applications help establishing the quickest connectivity between service receiver and service provider. Tourists generally tend to search, circulate, and exchange information through mobile or smartphone-based information technology and social media (Han & Verma, 2014).

Additionally, the institutions of Bangladesh can emphasize more on the effective application of social media technology because tourists' destination, accommodation, and restaurant selection is mostly influenced by the posts, reviews, and ratings on social media platform by those who already experienced it before (Fotis et al., 2011) and sometimes, social media can be used as a tourist guide (Liu et al., 2020).

As a part of the innovation process, tourism and hospitality organizations apply different kinds of technologies like Travelers' Biometric System (TBS) especially in airlines, e-lienation, geo-based technology, tourists' mobility using GPS, Light Detection and Ranging (LDR), Geographic Information System (GIS) to ensure tourists' safety and security (Morosan, 2012; Yang et al., 2012; Tussyadiah & Zach, 2012; Tribe & Mkono, 2017). So, the public and private tourism and hospitality organizations of Bangladesh can also apply such innovative technologies to ensure the safety and security of tourists, enhance tourist satisfaction, and manage visitors with a view to ensuring maximum benefits of using technology from the tourism and hospitality industry.

Conclusion

The technological revolution generated by the Internet and innovative technological tools, devices, and systems has significantly changed the business dynamics for tourism organizations. It is found that almost every tourism and hospitality functions such as guest bookings, registrations, check-in, check-out, and interdepartmental communications is conducted manually in the pre-internet era but now, so many innovative technologies such as e-tourism, Web 3.0, AI, AR, VR, IoT, IoE, wearable devices, voice technology, biometric recognition technology, etc. are applied extensively for providing quality and efficient services in the industry minimizing all manual and time-consuming functions. Most importantly, the influences of innovative technologies are rapidly getting clearer particularly in the area of marketing and promotions of tourism and hospitality offerings, ensuring the safety and security of tourists, delivering quality services, disseminating necessary information, managing tourists or guests, assuming tourists' perceptions, providing training to employees, and building employee capacity. The literature analysis undertaken in this chapter clearly demonstrates that to satisfy the needs, wants, and demands of the potential tourists or guests, improve institutional performance, maximize

competitiveness, and sustain in the upcoming years, the tourism and hospitality public and private institutions must have to recognize, transform and implement innovative technologies strategically. Following that, this chapter attempted to explore the role of private and public organizations associated with the tourism and hospitality industry in Bangladesh in applying innovative technologies.

In Bangladesh, the public and private tourism and hospitality institutions can play an effective role in applying innovative technologies especially in the above mentioned most technology-affected fields. Both public and private institutions can also improve their performance in digital marketing and management using advanced innovative technological devices and systems. Generally, as national tourism organization BTB and BPC can play the leading role for the successful application of innovative technologies in marketing and promotional segment, and tourism development respectively; besides the private prayers of the industry like travel agents and tour operators, hotel/motel/resort owner associations, etc. can offer their packages, automate their business functions through the application of technological innovations. In addition to using AI, AR, VR, IoT, IoE, Big Data, Biometric system, Mobile technology, social media, etc. technologies, the industry associated institutions of the country should emphasize more on developing technology-skilled human resources as success depends mostly on by whom and how innovative technologies are applied. Future research should focus on how to develop technology-skilled human resources to ensure the effective application of these technologies.

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Part V
Social Media, Networking and Connectivity

Chapter 14
The Role of Social Media as an Element of Tourist Motivation in Bangladesh

Samshad Nowreen and Kazi Faruk Hossain

Abstract Social Media (SM) through the World Wide Web (www) is a very effective incorporation of innovative technology throughout the world. The application of SM is not only confined within a single aspect of human life rather its influences every sphere of the daily life. Like many other industries, application of SM in tourism industry is remarkably significant. SM fulfills the objectives of tourist and the travel agencies by contributing to flourish tourism industries by its user-friendly attributes. Recently, the influence of SM has been observed in the potential tourism industry of Bangladesh. This chapter depicts the role of SM in tourist motivation, which has been further analyzed from an inherited primary data. Total 200 university students aged between 18 to 24 years from three public universities had gone under questionnaire survey. The findings reveal that, SM has positive impact on tourist motivation on traveling, as SM helps the tourist to get necessary information for traveling, such as; destination selection, financial planning, accommodation, food, culture of the place etc. Therefore, along with the positive aspects of SM in tourism, the challenges regarding using SM in tourism industry have been identified as the young tourist faced. Recommendations have been formulated to ensure SM as a more reliable source for the tourist to make their decision of traveling through browsing in the SM.

Keywords Social media · Tourist · Information motivation · Bangladesh

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Introduction

Information Technology (IT) and Social Media (SM) have become appeared as useful platforms of mass communication (Karim, 2018). Even a decade ago, people were less connected to the world. However, at present, people can get information on their fingertips that range from news, reviews to promotional videos. Due to the advancement of science and technology, people throughout the world are easily connected to each other through SM with the ease of access to Internet. Bangladesh Telecommunication Regulatory Commission (BTRC) data show that up to February 2020 the total internet users had been 60.7% of the total population of the country, and 20.5% have active Facebook account (Internet World Statistics, 2020). People aged between 18 to 24 years had the highest percentage of using SM where the Facebook users are in the highest position throughout the world (Statistics Brain Research Institute, 2020; Gururaja, n.d.). Facebook and other SM have made the world so smaller beyond landscape variation brining quick contact to people living far beyond. Among the travelers, people aged between 15 to 25 years are the mostly travelled aged people and they like to browse in SM such as Tripadvisor, Facebook, YouTube, Trivago, Couchsurfing and so on (Karim, 2018).

SM indicates the mode of communications among users in which they exchange, share, or generate information and ideas in virtual communities and networks (Tafveez, 2017). There are different kinds of social networking site such as Facebook, WhatsApp, Instagram, Twitter, LinkedIn, Google plus, Tripadvisor, Pinterest etc. Each has its own attributes to enhance the communication among users. Among different SMs, Facebook, and WhatsApp have the highest record of rate of users (Ly and Ly, 2020). People are gleeful to participate in the social network since it keeps them engaged with up to date information around the world. SM encourages the users to share their opinion, feedback of services, search information, share thoughts, experience, feelings, as well as it helps them to justify any information they got from any social communities by checking with others by conquering the world boundaries. This also help them to make their decision about traveling in any particular destination getting information from the various websites. SM offers access to everybody as well as encourage others to pace their opinion in the comment option (Mayfield, 2008). SM platforms have become significant both from personal and business perspective throughout the world. In today's times SM plays a very important role in almost every segment. It has made an enormous impact on the tourism industry.

According to Zeng (2013), tourists who use social networking system get huge information in very short time making their travel decision smooth and comfortable. They get reviews about individual tourist destination. They also know about some particular concerns as traveling information and travel experience (i.e. hotel's cost, accessibility, transportation, food and beverage etc.) from other fellow tourists. Tourists, irrespective of their age, like to post their experiences on their own SM sites or blogs about their traveling, upload photos of entertainment, foods, vehicles, hotel rooms, beauty of natural sites of the tourist destinations. Most importantly

from SM, a person can communicate with huge audience from various geographical locations.

On the other hand, in tourism promotion, the role of SM is very significant as the industries involved in tourism business such as travel agency, tour operators, hotel, restaurant, aviation and vehicle etc. are concerned with the quality of the products and services they provide along with feedback or review rom the tourists every time. Good quality service from the agencies and their representatives motivates the tourists for traveling as well as rivet their trust on specific product or service. Therefore, it is seen that after the popularization of SM, travel frequencies and rate of both national and international traveling has increased. This is now considered as one of the top most way of virtual marketing of tourism products and services (Zeng & Gerritsen, 2014; Ráthonyi, 2013).

Furthermore, SM has expanded the scope of online based marketing in many businesses including tourism. Like the world tourism in Bangladesh is also a growing industry, with burgeoning international tourists, emerging domestic tourists directly contributes 2.2% of the total GDP, generating only 0.4% of GDP from visitor's export, and creating 1.8% tourism related jobs, is considered as an underdeveloped industry (World Travel & Tourism Council, 2017). SM ironically, is becoming a reliable tool in the expansion of tourism industry in Bangladesh for both domestic and international tourists because active or potential tourists easily get their required information browsing SM. Therefore, spontaneous review and feedback from the SMs increase their interest and grows tourism market. Bangladesh is ahead towards a developed country and the country is committed to transform the country every sector in digital by 2021. Moreover, user of internet is increasing over time and most users are of SM that gives a good platform in both promotion of tourism industry and motivation of the tourist.

Tourism: Aspects and Impacts

Tourism is vibrant as because it has different aspects from recreation to business, pilgrim to adventure seeking or knowledge exploration. Some tourists are sun lust, and some are backpackers. This wide range of tourists makes it a complex and diversified industry. Both the tourists and industries involved in it offers multiple opportunities for different groups of people to generate livelihood. Tourism enhances the development industries such as, hotels, resorts, restaurants, casinos, cruises, markets, aviation and transportation, photography, banking etc. Tourism refers to the activities of people who travel to and stay in places outside their normal environment for no more than one year for recreation, company, or other reasons that are not linked to the exercise of a remunerated task within the destination (Organisation for Economic Co-operation and Development, 2001). Tourism industry of a country contribute largely of its economic growth through employment generation and foreign currency earning. Besides, tourism offers a great opportunity for the travelers to exchange culture from the host to foreign destination (Roy & Roy, 2015).

According to Sultana (2016), like many other industries, tourism industry contributes in the national economy throughout the world. Most specifically around 83% countries of the world where tourism industry is being considered the most significant industry of economic growth. Both in developed and developing countries, tourism industry is flourishing rapidly. The industries are very influential directly in the developed countries such as USA, UK, Italy, and France. In the last few decades, many Asian countries as, Maldives, Singapore, Thailand, Malaysia, India, Nepal, and Bhutan are becoming appealing to the tourists due to their diversified products and services such as climate, natural beauty, and warm hospitality with enriched culture and food. However, tourism industry has both positive and negative impact on social, cultural and environmental aspects of the host countries (Roy & Roy, 2015). In a nutshell, tourism industry evolves various forms and the expansions of the tourism industry while playing a role in changing the destiny of the people including the national economies of different countries of the world.

The Tourism Industry in Bangladesh

Bangladesh is one of the most beautiful countries in South-East Asia full of greenery, surrounded by India, Myanmar and the Bay of Bengal (Roy & Roy, 2015). It is called the land of natural beauty. Tourism industry is gradually developing in the country as its lush green nature, many rivers, canals, lakes, haors, the world longest continuous sea beach, mangrove forest the Sundarbans, hills, antiquities and beautiful villages are the source of beauty. Young Bangladeshi tourists are found very captivated in traveling different naturally beautiful and heritage sites. The presence of both domestic and international tourists are well informed about the destination. Researchers (Karim, 2018; Roy & Roy, 2015) in their studies mentioned, different attractive tourist destinations of Bangladesh in different divisions.

Thus at present, the tourism industry in Bangladesh is considered as a very promising industry, because this industry is not only meeting the needs of tourists, but also it is influencing through positive impact on the national economy, culture, livelihood, infrastructure, investment and overall growth. Moreover, Bangladesh is well imaged in front of the whole world (Redwan, 2014). The role of tourism industry in Bangladesh economy has been positively contributing over the last few years. At the same time, support from govt. in tourism industry in increasing. World Trade and Tourism Council (WTTC) (2020) presented the contribution of travel and tourism industry in the national economy of Bangladesh in 2019 is 3% in GDP. This industry has also contribution on national investment with positive feedback (Roy & Roy, 2015).

Having a strong foundation of tourism in Bangladesh, sustainable use with proper management of both naturally and historically attractive tourist destinations can contribute huge to the economy of Bangladesh.

To enhance the tourism industry, in 2010, the Bangladesh Government incremented the national tourism policy of the country. It opened a new window of

opportunities by fostering employment, economic as well as infrastructural development and sustainable tourism development (Hassan et al., 2020; Hassan & Kokkranikal, 2018; Hassan & Burns, 2014). In Bangladesh, the Government has imposed Bangladesh Parjatan Corporation (BPC) under the ministry of Civil Aviation and Tourism for tourism devepment and promotion from 1972. Bangladesh Tourism Board (BTB) and National Hotel and Tourism Training Institute (NHTTI) is all together working to establish tourism industry of Bangladesh (Roy & Roy, 2015). According to Karim (2018), Bangladesh has adequate scope for tourism development; rather govt. should come up with required actions to develop this industry not only for the tourist, but also for the national development through poverty alleviation, economic growth, infrastructural development, environmental sustainability and foreign earning.

Social Media, Tourist's Motivation and Promotion of the Tourism Industry

SM has positive influence on both the tourist and the stakeholders of tourism industry. According to Shahin and Sengun (2015), SM offers a good opportunity of tourism marketing, which influence both tourist and the tourism. Bagaturia and Johnson (2014) also stated that, the introduction of SM in tourism marketing is a significant and modern addition to tourism industry. Hajli (2014) stated that, SM helps tourists by connecting them with communities where they get the scope to sharing their views, opinion, experience of traveling; that helps others to make their decision about their own travel plan. At present tourists are mostly technology user, therefore, travel agencies and tour operators should have proper arrangement to draw attention of these tourists (Rahman, 2016). SM offers multidimensional ways of communication with instant feedback opportunity, therefore, exchange and sharing option is very easy of tourists (Dina & Sabou, 2012). According to Poell (2014), tourists have larger dependency on SM to make their decision about their destination, most of them search for review what are the experience of other travelers about a tourist destination. Kazak (2016), in his study mentioned about the significance of SM in tourism industry, tourist decision making and tourism marketing. Therefore, SM by nature is becoming inclusive to the travelers.

Methodology

A primary survey had been conducted on public university students of Bangladesh where 200 students from three public universities, located at the capital Dhaka were selected purposively through convenient random sampling. The average age of the sampled respondents was between 18 to 24 years. When Bangladesh is marching

towards a digital Bangladesh, the youth are becoming used to with information technology. The selected universities have residential facilities and students from different socio-economic status stay together. They have the facilities of sharing ICT related gazettes and universities mostly offers free Wi-Fi facilities within the campus ground. In contrast, the use of smartphone is increasing due to its cheaper price of the students from different socio-economic status. Therefore, the use of SM has become a very common trend among the youth learners.

Findings and Analysis

The use of SM for multiple purposes by tourists is common throughout the world. Analysis of the data collected from the sampled respondents reveal that around 100% of the respondent use smartphones, where 48.5% use both smartphones and computer or laptops. No was found without smart device that was interesting of the survey. Also, about 98% of the responded they are motivated through SM for traveling, whereas rest 2% are often being motivating through SM for traveling (Fig. 14.1). The respondents are more motivated from browsing through SM through getting information or seeing photos posted by other tourists or promotion from travel agencies in the SM.

Findings reveal in the below Fig. 14.1 that 97.5% students' uses SM as a regular basis whereas 2.5% uses SM occasionally, but not regularly. However, no students were found who do not use SM.

The result shown in Fig. 14.2 affirms that among the respondents, 64.9% of the respondents feel better by browsing information from travel sites or SM and photos of destinations of their interest uploaded by other travelers.

The below Fig. 14.3 shows that before any travel plan, users are keen to browse SM for making their travel decision, to get necessary information, and to read reviews of particular destination or product or services. Also, during daily Facebook or other SM browsing, they search for new tourist page or recent uploads. If any such page or upload are spotted, they browse for more details for both the

Fig. 14.1 Frequency of SM use. (Source: Survey by the authors, 2020)
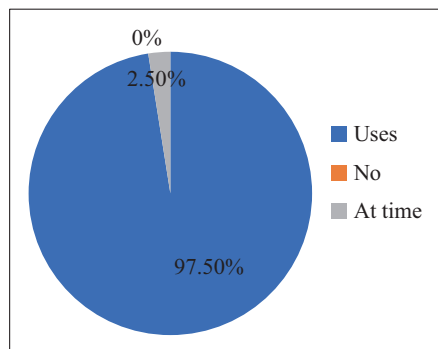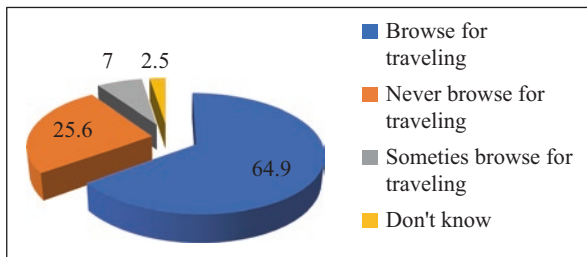
Fig. 14.2 SM browsing for travel information. (Source: Survey by the authors, 2020)

Fig. 14.3 SM browsing trend for tour and travel information. (Source: Survey by the authors, 2020)
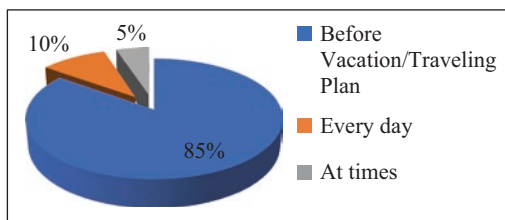
attractions and surroundings. However, mostly they browse before their travel to make a suitable decision.

Different forms of SM are used by the respondents as shown in Fig. 14.4. This shows that among the SM Facebook, Google, YouTube and Instagram are mostly used by all.

Internet users spend a lot of time every day for surfing on various purposes and use of SM is one of the influencing factor for internet surfing. Among the students 55% students spend almost 2–4 h on SM, while very few 2% use more tham 6 h on SM (Fig. 14.5). On the other hand, around 30% students use SM 0 to 2 h on SM every day. The purpose of using SM was investigated, and along with entertainment some other reasons were found as:

SM becoming the most important means of tourism in this twenty-first century ICT based world of globalization (Fig. 14.6). Role of SM at various aspects of human life as mentioned above is inevitable. Therefore, the influence of SM in promotion of tourism industry by motivating the tourist is a concern. ICT friendly materials, like smartphone, computer, laptop etc. are prerequisites of using SM.

From the survey, factors that are identified as the benefits of browsing in SM for tourism are highlighted in Fig. 14.7.

SM are supportive to the tourist in various ways as found from the survey of students (Fig. 14.7). The young students like to enjoy their academic vacation through traveling. They arrange tour with their friends and at the same time with their family members. In both ways, they used to travel by a team considering different aspects of travel considering cost, security, accessibility, permission from the guardian etc. At present, SM is providing positive role in influencing the tourist to mold their choice and interest towards traveling.
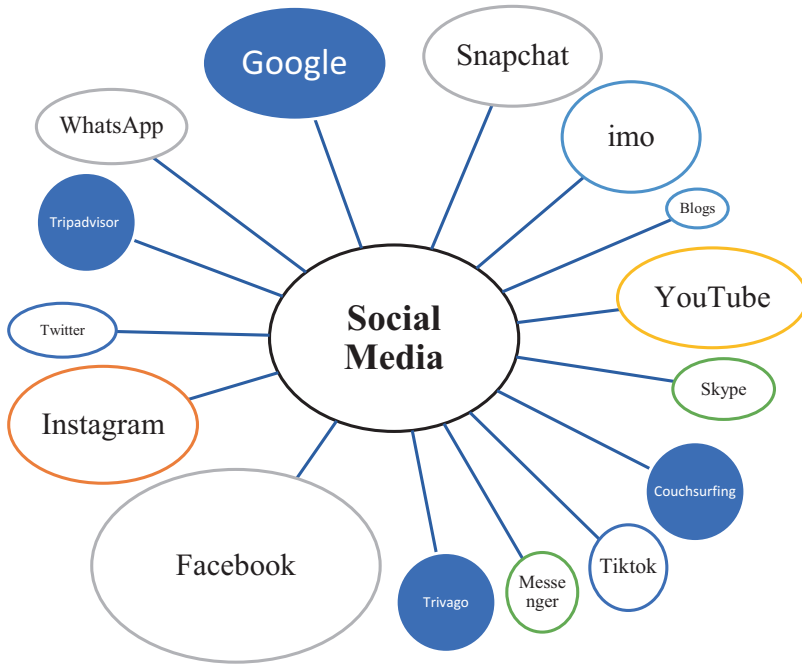
Fig. 14.4 Mostly used SM types by the youths. (Source: Survey by the authors, 2020)
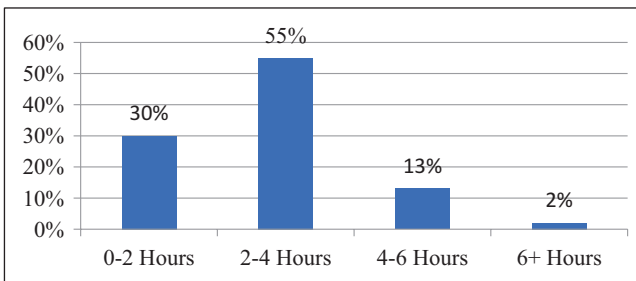
Fig. 14.5 Time spent every day on SM. (Source: Survey by the authors, 2020)

The advantages of using SM in tourism for the tourist are mentioned above as stated by the respondents. The advantages mentioned above are the fundamental motivational force among the tourist for their traveling. SM plays an increasingly important role in many aspects of tourism, especially for information searching and decision-making process. Tourism promotion focus on the best practices for interacting with consumers via SM channels (social sharing of holiday experiences).
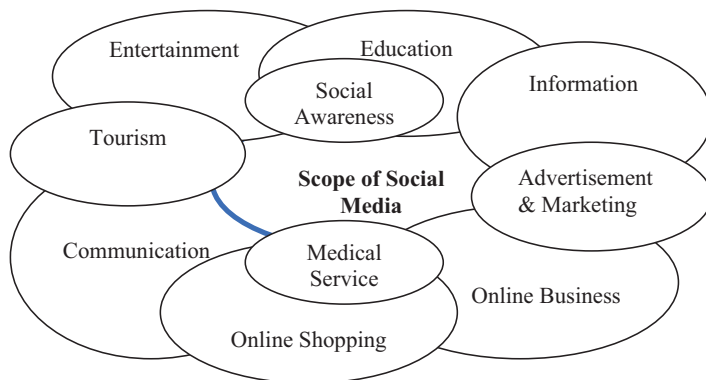
Fig. 14.6 Scope of using SM. (Source: Survey by the authors, 2020)
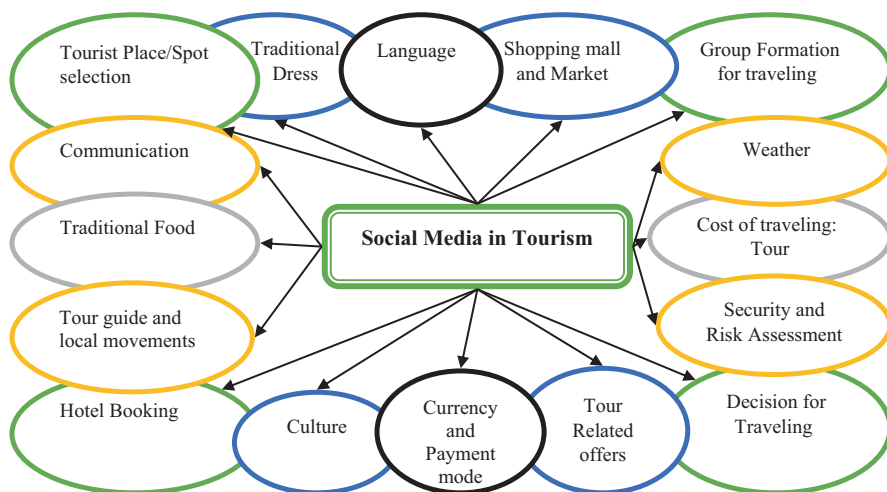
Fig. 14.7 Advantage of SM in tourism. (Source: Survey data analysis by the authors, 2020)

What are the Challenges that Tourists Face After Taking Decision for Traveling After Using Social Media in Bangladesh?

SM is becoming the most interesting and reliable source of information for choosing tourist destination and other related issues such as climate, security, restaurant and recreation facility etc. However, sometimes tourists have to face some difficulties relying on SM and creating travel plan. The common challenges identified from the students using SM as a tool for making their travwl plan are as the following:

- Sometimes SM do not provide accurate information of a tourist destination, accommodation, and transportation facilities. Tourist generally uploaded photos and videos but sometimes it is the outcome of editing. Interested tourists reveal the false imaged they had about the destination. Therefore, they feel disheartened after visiting the destination.
- False review and advertisement is another challenge tourist might face. Tour operators or travel agents sometimes do not have the real arrangement as they advertise about the tour.
- In some cases, the pages of SM do not provide details information of traveling or there are incorrect or lack of information. Tourist in many cases becomes bothered having double game from the tour operators or guides. They sometimes claim extra or hidden charge after accommodating others attractive destination. Systematically, they perform dishonesty which discouraged the travelers.
- Lack of management of SM, most particularly, the lack of very up-to-date information. The tourists lose their trust and thus the become discouraged to follow SM.
- Fake promotional video are about destination sometimes showed.
- Lack of trained guide is another challenge that tourists face. A skilled guide is inevitable part of tourism for the new tourist. New and untrained guide is a trouble for the tourists, however, in SM sometimes it is informed that tour guides are well trained.
- Tourism related pages usually advertise for the most attractive and renowned tourist destination. However, the tourists are being discouraged about the new tourist destination.

SM is becoming a good source for the tourist for making decision about travel. Ironically, an unexpected circumstance creates by the SM users at times discouraged the tourist to follow SM. In many cases, study tour of many educational institutions mostly depends on the information uploaded in the SM.

What to do to Increase the Reliability of SM for Tourism Promotion?

Considering the existing challenges of SM in tourism, the following issues are expected to be developed:

- More organized and accurate information should be portrayed.
- Every tourist destination should be highlighted properly
- Pages of SM should have a good management to provide up-to-date information about specific destination.
- Actual scenario through photo or video sharing of the tourist destination should be uploaded in different pages without editing or falsification.
- Newly developed tourist destination should be highlighted properly.

- Traveler groups, and other related pages should be more responsible in publishing information regarding tourist destination and other supportive information of tourism.
- In the pages or groups, more relevant information should be uploaded.
- Reliability of the SM users should be ensured.
- Review of the pages should be authentic.
- Tourism agencies and their services are often costly, although competitions found among the agencies to attract tourist. Therefore, different opportunities should be uploaded to motivate the tourist from different economic classes. This should be supportive for those who have financial problem.
- Tourist although getting motivation from SM but at times they cannot go out for travel due to their security concern. Therefore, the Government and agencies should ensure safe and tourist friendly environment irrespective of gender.
- During advertisement about a tourist destination, the users should be loyal to publish all the difficulties along with the opportunities of traveling of any particular destination.
- Government should develop a guideline for those who involves in tourism business and use SM for their business purposes.
- Tourism policy should have proper guideline about the use of SM in tourism industry.

Tourism industry is a flourishing industry for the economic development of Bangladesh. People are becoming more dependent on ICT based gazettes in this twenty-first century. Everywhere, the use of ICT, therefore the SM is remarkably increasing. Most particularly, use of SM in tourism industry is rising gradually. Travelers prefer to browse for a new destination or emerging tourism products and services are boosted in SM to attract travelers. For an example, if somebody wants to travel to Sajek, they need the information of local transportation, accommodation, food etc. The information are available in the SM such as Tripadvisor, Facebook travel group or Google will help them for their tour. Even, if somebody wants to travel in cruise on rivers, sea, lakes, ponds or pools etc., then SM should be considred as a good platform or source of tourism information. Therefore, SM users should be more responsible in this regard and should ensure their accountability of services.

Conclusion

SM is one of the important things that science has invented to make people's lives easier and more enjoyable. SM has opened up immense potential for the tourism industry. Travel agencies are easily able to attract tourist using SM. Tourists, tourism agencies and the state are all benefiting from this. In order to attract domestic and foreign tourists, the role of SM is of course significant. The role of SM is unique in the socio-economic development of the country and being globalized. The role of

SM over the tourist to increase their interest of traveling is observed and analyzed. Therefore, once the existing challenges are overcome through the quality of collaboration among the Govt. and other related stakeholders, the tourism industry and tourist will be beneficial more through the proper use of SM.

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Chapter 15
Social Media as a Technology Supported Enabler for Tourism Promotion in Bangladesh

Md. Rakibul Hafiz Khan Rakib and Azizul Hassan

Abstract Following the development of technology and the expansion of users' communication range, social media turns out as one of the dynamic tools for daily social interaction. In reality, this creates scopes for users to interact with each other that are rather essential and beneficial to motivate people socially. Since, the capacities of social media expand tourism as an industry also becomes influenced. This influence in principle can lead to tourism promotion as supported by the relevant stakeholders and tourism administration. The aim of this chapter is to figure out the interaction between tourism promotion and the usage of social media. While understanding the interaction, the chapter particularly focuses on tourism stakeholders and tourism administration in Bangladesh. The chapter carried out content analysis and conducted in-depth interviews for data collection. Results show that social media can interact effectively between the stakeholders and tourism administrators that can leave positive influences for tourism promotion. Using social media, both the stakeholders and tourism administrators can facilitate the promotion of tourist destinations by experience sharing of satisfied tourists. This can also enhance the quality of tourists' tour planning as they can be enlightened with unpaid, honest recommendations and suggestions of other users. The chapter suggests that social media promotion allows for looking at the tourists as partners in designing, developing, marketing and producing better tourist experience.

Keyword Tourism · Stakeholders · Social media · Promotion · Bangladesh

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Introduction

In today's extremely competitive tourism market, only the presence of natural and manmade historical scenic beauties is not sufficient for a country like Bangladesh to survive and flourish as a tourist destination (Pramanik & Rakib, 2020). All the attractive hills, rivers, beaches, islands, forests, floras, faunas, archaeological sites, and historical and religious places of the country must be carefully promoted to the prospective tourist markets. Promoting a tourist destination is a must not only for communicating the necessary information and features to tourists (Bao, 2018), but also for reminding and persuading the tourist in making visit or revisit decision (Goeldner & Ritchie, 2011; Kotler et al., 2006). Besides traditional tools like advertising, personal selling, sales promotion, direct marketing, events and experience marketing, public relations, sponsorships, and word of mouth communications (Kotler et al., 2010), destination marketers are increasingly adding digital tools like online marketing, social media marketing etc. to attract visitors (Rakib & Pramanik, 2020; Uşaklı et al., 2017).

The increasing popularity of social media reflects significant progress in the evolution of Web 2.0 and the Internet (Öz, 2015). At present, billions of people all over the world rely heavily on social media for their everyday communication, socialization, entertainment, learning and work (Al-Badi et al., 2013; Ráthonyi, 2013). Besides, a large number of marketers are using social media for promoting their products and services because of its low cost and global reach (Nusair et al., 2012; Uşaklı et al., 2017). Virtual connectivity through social media becomes a new reality now (Rakib and Hassan, 2020). Motivated by such effectiveness of social media use as a marketing promotion tool, numerous countries all over the world are using various social media platforms to digitally manage and promote their destinations and related tourism products and services (Al-Zedjali et al., 2014; Leung et al., 2011; Tham et al., 2019; Xiang and Gretzel, 2010). As tourists usually search for lots of information before making destination choice and visit decision, social media becomes one of the key sources of collecting such information. Xiang and Gretzel (2010) declared social media as primary medium for sharing travel information among travelers, whereas Gretzel et al. (2008) noted user generated content (UGC) like online travel reviews as more frequently used platforms for sharing travel-related information. Hence, in current years, social media has materialized as a commanding tool for destination marketers in reaching the tourist market.

The effectiveness of social media in reaching the tourist segment is well established. Numerous studies (i.e. Howison et al., 2015; Osei et al., 2018; Öz, 2015; Singh & Srivastava, 2019; Tham et al., 2019) have already confirmed that social media can successfully reach the tourists and influence their visit decision. But surprisingly, in most of the cases, this communication mechanism initiated primarily by the destination authorities and marketers failed to integrate diverse groups of other tourism stakeholders in its reach. Therefore, central tourism authorities and destination marketers must carefully design their social media contents and manage its propagation among tour operators, tourism service providers, local communities,

and other national and international development agencies besides the tourism market segments in order to ensure sustainability of respective destinations. For a developing country like Bangladesh whose tourism sector is practically in embryonic state, this becomes even more obligatory.

In Bangladesh, Bangladesh Parjatan Corporation (BPC) initially started acting as the National Tourism Organization (NTO) from 1973 with a view to promoting and developing the country's tourism industry (Hossain, 2015). But, to accelerate the pace of tourism promotion and development, the government later established Bangladesh Tourism Board (BTB) in 2010 and shifted the responsibility of NTO from BPC to BTB (Bangladesh Tourism Board, 2020). Besides, BPC and BTB, some other government organizations and agencies like Ministry of Civil Aviation and Tourism (MoCAT), Department of Archaeology etc. also bears the prime responsibility of tourism management and administration in Bangladesh. All these organizations behold the national pride and support the development initiatives of entire tourism sector of the country. Although all the aforesaid organizations adopted many social networks like Facebook, YouTube, and Instagram as social media tools for promotion and administration of different attractions, but their affectivity in reaching diverse groups of stakeholders is questionable in Bangladesh. However, throughout this chapter, the authors try to outline the interaction of various social media networks in tourism promotion and administration between the authorities and beneficiaries in Bangladesh.

Tourism Stakeholders in Bangladesh

The role of stakeholders in formulating and administering tourism policy and planning as well as in the development of this industry is vital for almost all countries. Stakeholders are individuals or groups who may affect an organization's achievement or affected by that particular organization (Freeman, 1984); that is, who have some legitimate interests on that organization. Therefore, tourism stakeholders are individuals or groups who have justifiable interest on tourism development and who can influence or be influenced by the said development initiatives (Aas et al., 2005). Tourism stakeholders include a diverse group of players such as tourists, host citizens, entrepreneurs, governments, community leaders, tourism business and other sectors (Gunn, 1994; Swarbrooke, 2001) who are interested in tourism and its development. However, a comprehensive list of such stakeholders may include: local residents and governments of host destination, local and remote tourists, environmental groups, tourism facilities providers like transportation, accommodation, food and beverage, conference and events, and recreation and entertainment facilities providers, DMOs, cultural and social activists and groups etc. (Goeldner & Ritchie, 2011).

In Bangladesh, participants from local communities, entrepreneurs, numerous types of investors, governments, tourists and other tourism service providers actively take part in strategy formulation and implementation plan for the development and

management of different tourist destinations; and therefore, they should be considered as stakeholders of Bangladesh tourism system (The Daily Star, 2013). These categories can be broadened to include BTB, BPC, overseas Bangladeshi embassies, hoteliers, transport service providers, tourists, tour operators, resort owners, travel agents, travel writers and academicians, governments of all levels-from local to central, media, tourists' information center' (TIC) and other NGOs as tourism stakeholders in Bangladesh (Daily Sun, 2016; Islam & Al-Amin, 2019). However, for Bangladesh, the most pertinent stakeholders are tourists, local communities, government tourism institutions and agencies, private and public tour operators, travel agents, hoteliers and resort owners, transportation and food service providers, community entrepreneurs and other social and environmental activists. In Bangladesh, the development of tourism industry largely depends on the active participation and collaborative efforts from all these stakeholders. Social media can be a viable option for reaching these stakeholders through promoting a destination to them, informing them persuasively and attracting their proactive participation in the long term development and management initiatives.

Tourism Administration in Bangladesh

Affectivity of social media in reaching the aforesaid stakeholders largely depends on careful management of social media promotion by tourism administration in Bangladesh. Tourism administration is nothing but a clearly defined regulatory and legal framework for tourism management and development. It basically involves the establishment of governmental organizations, which provides the structural framework to ensure the proper management of tourism in an area, region or nation. Tourism administration can be of centralized (top-down) or decentralized (bottom-up) structures (Ndivo & Okech, 2019; Yüksel et al., 2005). However, for a developing country like Bangladesh, tourism administrations tend to be mainly centralized and involve focus of authority and decision-making by government administrative bodies' i.e. ministry of civil aviation and tourism, BPC and BTB etc.

As mentioned earlier, government of Bangladesh established Bangladesh Parjatan Corporation in the year 1973 as the country's first NTO. Although the responsibility of NTO shifted from BPC to BTB later, but the responsibility of promoting country's tourism to the rest of the world still remains with BPC to some extent. However, the prime focus of BPC is now concentrated on the tourism related facility structure development in Bangladesh in order to introduce Bangladesh as tourists desired destination. As part of their management function, this state owned tourism agency also circulate tourism publications, create awareness for tourism among different stakeholders, and train-up prospective tourism personnel under its different institutes. Government of Bangladesh established Ministry of Civil Aviation and Tourism for the first time in August 1975 and second time in December 1977. However, after successive change, the government again re-established Ministry of Civil Aviation and Tourism in 1986 with a view to contribute to the

national growth through ensuring development of country's tourism industry and has been abiding do so since then. This ministry, as part of administering, also undertakes research activities for formulating, implementing and time to time updating tourism policies and laws relating to travel agencies and other service organizations so that it can boost the pace of development of country's tourism industry. Present government established Bangladesh Tourism Board as the statutory body of tourism sector to look after the country's tourism industry development initiatives and shifted the responsibility of NTO to BTB in 2010. As NTO, BTB performs numerous activities such as tourism planning, constructing updated tourism laws and regulations, creating tourism friendly environment for domestic as well as international tourists, promoting country's tourist destinations through web-based techniques, executing responsible tourism through active participation of tourism stakeholders etc. One thing should be worth mentioning that, at present, BTB acts as the NTO by following the best practices of public and private partnership for tourism promotion and management by incorporating many private representatives from tour operators and travel agencies associations, academicians, restaurant owners' associations etc. in its governing body. However, all these bodies (BPC, MoCAT, and BTB) related to tourism administration in Bangladesh use social media as a means of tourism promotion.

Concept of Social Media

Recent development in internet based connectivity and technology is reflected by the development of Web 2.0 over the traditional Web 1.0 platforms. Web 2.0 is popularly viewed as the second generation of web-based services in which users of the platform can interact with each other; whereas in Web 1.0, users are usually confined with viewing the contents only (Cormode & Krishnamurthy, 2008). The concept of social media (SM) is believed to be developed on the technical foundation of Web 2.0. However, there is no universally established definition of social media and different scholars and authors defined it from different perspectives (Kaplan & Haenlein, 2010; Sharma et al., 2017; Yadav et al., 2016). Kaplan and Haenlein (2010) define social media as a group of applications based on internet connectivity that are developed on the ideological and technological fundamentals of Web 2.0 that permits the design and exchange of UGC.

As the social media encourage the creation and sharing of user generated contents (UGC); hence, many scholars termed it as consumer generated media (CGM), social websites, or user generated media (Fotis et al., 2012; Öz, 2015). Moreover, Jones (2009) defines social media as a category of online media where people participate, talk, share, discuss and create online networks. It enables the users connecting to each other and sharing their views, thoughts, and feelings in a boundary less platform regardless of their nationality, culture and religion (Rakib & Hassan, 2020). In simple terms, social media are web-based applications that facilitate the dissemination of user-generated contents (Tussyadiah et al., 2015).

Social media consists of the social interactions and network of relationships among the people in a social space over the internet. Such media may include blogging sites, forums, photography archives, video sharing sites, and social networking sites that can help one-to-one (1-to-1) or many-to-many (M-to-M) communication (Fotis et al., 2011). These media can be available to anyone from anywhere who has internet access and from a tourism perspective; it can be used as a means for spreading and sharing destination related information with ease. Nowadays, social media are increasingly perceived as a strategic tool for destination management (Leung et al., 2011).

Uses of Social Media for Tourism Promotion

Developments of internet and ICT have changed the pattern of information dissemination among the tourists and destination managers. Latest internet based social media considerably influence the information creation and sharing among the travelers, tourism operators, destination managers and other national tourism agencies (Bakr & Ali, 2013; Buhalis & Law, 2008; Choe et al., 2017; Howison et al., 2015; Osei et al., 2018). Therefore, use of social media as a tool for tourism promotion can be analyzed from two different perspectives: tourist perspectives and tourism agencies perspectives.

Tourist Perspectives

Tourists usually use social media for searching necessary information regarding a destination, sharing their views and experiences on that destination and spreading their likes and dislikes on the same destination as tips to others. Hence, the uses of social media by tourists can be divided into three stages; pre-travel, during-travel, and post-travel stages (Amaro et al., 2016; Book et al., 2018; Osei et al., 2018; Tham et al., 2019).

Pre-travel Stage

In the pre-travel stage, tourists usually use social media as tools for searching information. Tourists search for ideas on where to visit, where to reside, what to eat and other leisure related activities in order to expedite the decision making procedure and reducing risks on the destination (Cox et al., 2009; Liu et al., 2013; Osei et al., 2018; Simms, 2012; Tussyadiah et al., 2015). Use of social media is highest at this stage.

During-Travel Stage

In the during-travel stage, travelers start sharing their visit experiences. Tourists focus on using social media shifts from searching information to disseminating travel experiences through comment, review etc. in order to share information about specific attractions, keep others informed about destination locations, or staying connected with families and friends (Cox et al., 2009; Hernandez-Mendez et al., 2015; Osei et al., 2018; Wu & Pearce, 2017; Fotis et al., 2011). However, use of social media at this stage is much lower than the pre-trip stage.

Post-travel Stage

In the post-trip stage, tourists normally use social media as a repository of their travel experiences. Tourists use of social media turn into a platform for destination evaluation through posting information, photos, thoughts, reviews, and comments on different attractions, accommodations, restaurants, transportation facilities, and likes and dislikes on overall destination management in order to guide other travelers (Al-Badi et al., 2013; Fakharyan et al., 2012; Fotis et al., 2012; Lee et al., 2014; Osei et al., 2018; Tham et al., 2019). Uses of social media at this stage actually focus on creating its contents.

Tourism Agencies Perspectives

Tourism agencies (i.e. national tourism organizations, destination managers, destination marketing organizations, tour operators and other tourism service providers) use social media mainly either as an instrument of tourism promotion or a tool for tourism management (Al-Badi et al., 2013; Hays et al., 2013; Parra-López et al., 2011).

SM as Promotional Instrument

Marketers are increasingly using social media instead of television or newspaper advertisements for promoting their products and services. In the tourism industry, destination managers and marketers are also using this tool for promoting their destinations (Dioko et al., 2011; Huang, 2012). NTOs, DMOs, and other tourism service providers promote their destinations and offers on their social media page or channels, attract the prospective tourists, enable the users to comment or share their thoughts, and encourage interactive conversations; leading to increased trust and positive word of mouth about the tourism attractions (Hays et al., 2013; Howison et al., 2015).

SM as Administrative Instrument

However, social media can also be used as a strategic tool for tourism management or planners through collecting and analyzing UGCs. Tourism agencies can analyze the data collected from their social media platforms in the form of user comments, likes, shares or reviews which can help in understanding tourist behavior and motivations; hence, enabling the destination managers and planners in offering the tourism products and services as per tourists' expectations through capitalizing on the strengths of the destinations (Al-Badi et al., 2013; Hamoud et al., 2016; Parra-López et al., 2011).

Types of Social Media Used for Tourism Promotion by NTO and DMO

Many scholars have tried to define and classify social media differently since its inception. But, as there is no universally accepted definition of social media among scholars and academicians, so as its classification (Constantinides, 2014; Fotis et al., 2011; Kaplan & Haenlein, 2010; Osei et al., 2018; Ráthonyi, 2013). Kaplan and Haenlein (2010) proposed six different categories of social media namely blogs, social networking sites, virtual social worlds, collaborative projects, content communities, and virtual game worlds. From a tourism perspective, (i.e. Osei et al., 2018) classified social media into five broad categories i.e. blogs, social networking sites, media sharing sites, collaborative projects and content aggregators. Mangold and Faulds (2009) categorized social media in 15 groups including social networking and bookmarking sites, business networking sites, creativity works sharing sites, user as well as company, podcasts, collaborative websites etc. Constantinides (2014) divided social media into five major types namely blogs, social networks, content communities, forums/bulletin boards, and content aggregators. Zheng and Gretzel (2010) grouped social media into six distinct categories as virtual communities, consumer review sites, blogs, social networking sites, media sharing sites and others.

However, the aforesaid groupings are not exclusive and many of them are often seems overlapping. Therefore, the authors' discussion on social media for reaching the tourism stakeholders on this chapter centered mainly on blogs, social networking sites, content communities, and forums. Blogs are personal online journal or diary type social web pages for sharing information maintained usually by an individual or small group of tourists, the contents of which are shared in an informal or conversational style (Constantinides, 2014; Kaplan & Haenlein, 2010; Mangold & Faulds, 2009). Blogs can be of text, audio or video based user or company sponsored web logs. Examples of some popular travel blogs include soultravelblog.com, adventurouskate.com, AmateurTraveler.com, travelblog.org, travelmate.com.bd, nijhoom.com etc. Social networking sites are online platforms that allow its users to

create personal profiles and network of relationships through creating and sharing information, messages and other contents accessible to other members of that particular network (Constantinides, 2014; Kaplan & Haenlein, 2010). Social networking sites are one of the mostly used social media for spreading e-word of mouth information and interactions among the tourism stakeholders. Examples of some well-known social networking sites are facebook.com, myspace.com, twitter.com, linkedin.com, instagram.com etc. Content communities are actually websites in which users can organize and share different types of media or UGCs like text, photo, music or video (Constantinides, 2014; Kaplan & Haenlein, 2010; Kim et al., 2010; Osei et al., 2018). Examples of content communities include text-sharing site like slideshare.net, open source knowledge site like wikitravel.org, photo sharing sites like flickr.com, music sharing site like itunes.com, and video sharing site like YouTube. Forums are online discussion site that allow interactive exchange of ideas and information among users (Constantinides, 2014). In some instances, they are also known as online message boards or bulletin boards; examples of which include travellerspoint.com, flyertalk.com, lonelyplanet.com/thorntree etc.

Present Scenario of Tourism Promotion Through Social Media in Bangladesh

Although the use of social media for tourism promotion among the tourism authorities is increasing across the globe, but its use among the tourism administrative agencies in Bangladesh is still limited. For the present study, the authors analyzed social media adoption and usage of three state owned tourism authorities namely BPC, BTB and MoCAT. Study result shows that, the uses of social media among these three agencies centered on Facebook, Twitter, YouTube and Instagram only. Both BPC and BTB use Facebook page, Twitter account, and YouTube channel; whereas MoCAT use Facebook page, Instagram account and YouTube channel to reach its stakeholders. Table 15.1 shows the adoption of different types of social media among tourism administrative agencies in Bangladesh.

The authors also interviewed 50 tourism stakeholders including tourists, local residents, tour operators, and destination managers to revel their likelihood of social media uses. Among the 50 stakeholders, 4 of them did not use any social media

Table 15.1 Adoption of different types of social media among tourism administrative agencies in Bangladesh. (Source: field survey, 2020)

Types of social media	Tourism administrative agencies in Bangladesh		
	BPC	BTB	MoCAT
Facebook	√	√	√
Twitter	√	√	×
YouTube	√	√	√
Instagram	×	×	√

whereas 46 of them use one or more types of social media. The results (presented in the below Table 15.2) show that, 97.8% of them use Facebook (45 out of 46 stakeholders), 73.9% of them use YouTube (34 out of 46 stakeholders), 65.2% of them use Google maps (30 out of 46 stakeholders), 13% of them use twitter (6 out of 46 stakeholders), 8.7% of them use blogs (4 out of 46 stakeholders), and 4.3% of them use Instagram (2 out of 46 stakeholders). However, the percentage of cases sums (263% in total) more than 100% because stakeholders often use more than one social media and multiple responses of the stakeholders are considered.

Content Analysis of Social Media Posts of Tourism Administration in Bangladesh

To analyze the contents of social media posts by BPC, BTB and MoCAT; the authors considered their all the social media posts on Facebook, Twitter, YouTube and Instagram posted during 01.01.2019–31.12.2019. A total of 319 posts were analyzed and categorized into six groups. These categorization (shown in Table 15.3) used for content analysis are adapted and modified from relevant studies (Hays et al., 2013; Uşaklı et al., 2017); and includes (i) Content materials used in the post like photos, videos or links shared; (ii) Information shared like fact, history, opinion or reviews on destination; (iii) Tourists engagement like likes or dislikes, comments, shares, retweets etc.; (iv) Interactivity like replies on users comment or answering users queries; (v) Promotional information shared like promoting a specific destination, hotels, events, foods or offers; and (vi) Others like political message, government manifestos other than tourism etc.

Although the total number of posts analyzed were 319, but as many of these posts consist of multiple types of contents; hence resulting in total 800 responses. The study result shows that, 76.8% of the posts (245 out of 319) consist of users' engagement such as likes, comments, shares, retweets or recommendations etc.; 65.5% of the posts (209 out of 319) includes content materials like photos, videos,

Table 15.2 Uses of social media by tourism stakeholders in Bangladesh. (Source: field survey, 2020)

Types of social media used by tourism stakeholders	Frequency	Percentage	Percentage of cases
Facebook	45	37.2%	97.8%
YouTube	34	28.1%	73.9%
Twitter	6	5.0%	13.0%
Instagram	2	1.7%	4.3%
Google Maps	30	24.8%	65.2%
Blogs	4	3.3%	8.7%
Total	121[a]	100.0%	263.0%

[a]Multiple responses

Table 15.3 Contents of social media posts of BPC, BTB and MoCAT. (Source: field survey, 2020)

Types of contents	Posts on social media (i.e. Facebook, Twitter, YouTube, Instagram etc.) by BPC, BTB and MoCAT		
	Frequency	Percentage	Percentage of cases
Content materials used like photos, videos or links shared.	209	26.1%	65.5%
Information shared like fact, history, opinion or reviews on destination.	79	9.9%	24.8%
Tourists engagement like likes, comments, shares, retweets etc.	245	30.6%	76.8%
Interactivity like replies on users comment.	22	2.8%	6.9%
Promotional information shared like promoting a specific destination, hotels, events, foods or offers.	97	12.1%	30.4%
Others like political message, government manifestos other than tourism etc.	148	18.5%	46.4%
Total	800[a]	100.0%	250.8%

[a]Multiple responses

or links associated with different attractions; 30.4% of the posts (97 out of 319) promote a specific destination, hotels, events, foods or circulate offers; 24.8% of the posts (79 out of 319) shares facts, history, reviews or opinions on particular destination; 6.9% of the posts (22 out of 319) were found interactive representing those posts in which authorities replied to users' comment or answering to users' queries; and 46.4% of the posts (148 out of 319) consist of political message, government manifestos, news of development agenda etc.

Impacts of Social Media on Tourism Stakeholders

Social media significantly affects all types of tourism stakeholders as it acts as one of the most reliable medium of information dissemination for them. Tourism products cannot be evaluated before consumption; hence perceived as risky by the tourists. Products and services related to tourism are well-differentiated, high priced and require high involvement; tourist therefore rely largely on the online reviews, comments and recommendations from other users before making their trip decision in order to reduce the loss of making a wrong decision (Cox et al., 2009; Leung et al., 2011) regarding where to visit, when to visit, how to travel, what to eat, where to stay, how much to spend at each destination and so on. Hence, social media is not only changing the way travelers plan their vacations, but also creating opportunities for destination owners, marketers or related entrepreneurs to digitally promote their products and services to prospective tourism markets so that positive reviews,

comments and recommendations can be secured. For instance, a family that is preparing to visit Cox's Bazar sea beach for an annual family vacation can search for information about the safety and security at the beach, hotels and resorts, restaurants and available transportation facilities on social media platforms and ask their friends, relatives, colleagues, and other tourists using the same media to share and communicate their feelings, ratings, and suggestions about different services and attractions in and around Cox's Bazar. Besides, destination marketers and managers can provide updated information on weather, price, accommodation, transportation, dining, and site seeing on social media with minimum cost and maximum reach, which the travelers can collect with minimum search efforts, leading to most informed and well-planned tour planning for the tourists (Berthon et al., 2012).

An interesting study by MDG Advertising (2018) found that, 30% of U.S. travelers use social media when considering a trip, 52% of the travelers are influenced by the photos shared on Facebook, 52% of the future tourists wanted to know about the new brands and services related to their desired destination through the Facebook page, 46% post hotel reviews whereas 40% shared restaurant reviews; hence significantly affect the future tourist behavior while giving a clear message for destination managers for confirming better social media presence.

The importance of social media for tourists as well as destination managers and service providers can be summarized as below:

- Social media has the capability to reach a wide range of present and potential tourist with minimum of costs.
- Social media allows the tourism administrations, destination managers, tourism service providers and tourists to set up personal relationship among them and the smooth exchange of information and destination experiences among them.
- Social media enables the destination managers and service providers to display information, offers, services and other facilities in an attractive and eye-catchy way.
- It facilitates the promotion of destination among the prospective tourism markets through the social sharing of satisfied travelers, providing the opportunity to improve future trip experience for tourists.
- It also enhances the quality of travelers' tour planning as they can be enlightened with unpaid, honest recommendations and suggestions of other users.
- Lastly, social media promotion permits to look at the tourists as partners in the design, development, marketing and production of the tourist experience.

Recommendations and Conclusion

Although the adoption of social media among large number of tourism stakeholders including tourists, destination managers, tourism service providers, community participants and tourism authorities are increasing rapidly, but the affectivity of social media as a tool for promotion and administration is not completely free from

questions. Despite the benefits offered by different types of social media platforms, their reliability and credibility are doubtful, particularly when initiated by the destination authorities' rather independent tourists. This problem can be encountered by encouraging honest reviews from the tourists and responding positively to negative reviews and pertinent queries.

As many tourists take tour inspiration from social media, destination managers must add tourist's photos and comments on their websites and reposting them on social media sites in order to give the prospective tourists a feel of what the destination has to offer. Official social media accounts of tourism administrations like BPC, BTB, and MoCAT along with other destination authorities and service providers should be created and maintained by trained moderators and those accounts must be updated regularly in order to be responsive to tourist queries. Informative posts, promotional offers, interesting photos and videos should be uploaded on various social media platforms. Many tourists love to post photos with attractive photoops. Destination managers need to establish such photo-ops to their attractions so that tourists can capture photos with photo-ops and post them on social media. Besides, destination managers and service providers can encourage the tourists to share their tour photos, videos or reviews with hash tag of particular destination/attraction after completing their tour.

In addition, tourism development in Bangladeshi destinations needs social dialogue in the form of discussion, exchange of information, consultation and negotiation among government, NTO and DMOs, employers and workers of different tourism authorities and destination service providers, local residents and tourists on issues of common interest. Last of all, all the tourism stakeholders should be encouraged to use social media for performing tourism related activities besides their typical everyday use of it.

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Chapter 16
Social Media Platforms in Tourism: Advantages and Potential Challenges in Bangladesh

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Abstract Social media evolves as such an influential platform for the travel loving people to mold the dream for their future travel decisions. The ability of the Internet to bring people under one umbrella leaving the border limitations is proved. Also, the development of regional networking infrastructure keeps people stay touched around the world. The common phenomena which are responsible for travel motivators to the future tourists involves sharing opinions about destinations, providing photos and sometimes their reviews after traveling different places. Bangladesh has experienced an expansion in domestic tourism in the recent years and it has become possible because of partial benefit from the digitalization programs across the country. These programs help future travelers to avail necessary information about their travel arrangements. The tourism industry has also been working on the promotion of their respective services through the online mediums to reach their target markets. This chapter discusses the available social media platforms, their usages in tourism followed by their effectiveness, advantages, and potential challenges in the specific context of Bangladesh.

Keywords Social media · Technology · Domestic tourism · Bangladesh

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Introduction

The Internet is recognized as an essential tool for us to stay depended from the early morning routine to the late night movies in the daily life of human being in current world. The scenario has taught us about an introduction of relying on something substantial for the betterment of future. The true globalization concept has achieved its zenith with the invention of the Internet which has been connecting people beyond race, region, age, sex, culture and so on all over the world. According to Statista (2020), the number of population across the world enlisted as the user of this technology is about 4.57 billion which is almost 59 percent of the total global population. This situation is showing us the true picture of peoples' gathering on the Internet and how they are utilizing it as their part and parcels of life. Even the trend like The Internet of things is helping us to attach our household chores to the aerospace research. One of the technology advisor and writer of "Data Strategy" Bernard Marr had expressed the notion of significance of artificial intelligence (AI) and The Internet of things (IoT) which are based on the Internet defines the future industry development as well as operation (Forbes, 2019). Every industry has been experiencing influence form the Internet and the Internet based platforms as well as they are using the best of their efforts to bring something beneficial out of it. Today, the Internet has brought the world's largest and fastest growing industry tourism at place where most of its transactions are driven by the presence of internet. The transaction making capabilities of the Internet has provided diversified facilities for both the marketers and consumers to meet the mutual benefits. The value creation process between the producer and consumer has changed drastically with the augmentation of the Internet based operations and transactions all over the world. The presence of large number of population over the Internet has influenced today's enterprises to come up with the new business models leaving the traditional way of doing business. Bangladesh is also on the ascending seat to bring the benefits of the Internet in every spheres of life of its citizens. The digitalization of different civil services for the population and the evolution of e-business models have leaded the generations towards adopting the Internet access in their daily life. A data set from 2017 published by World Bank reveals that 15% of the population was used to connect to internet. The development of technological infrastructure and the affordable the Internet facilities has produced some new statistics for the IT (Information Technology) sector and formulated a suitable business scope through using different platform through internet. A report from BTRC (Bangladesh Telecommunication Regulatory Commission) had also published that the number of the Internet user across the country reaches over 93 million at the end of March in 2019. The result has been concluding a point that the Internet and its necessities for country is increasing with the pace of global development. Understanding the usage of the Internet, this chapter examines the various social media channels available, their applications in tourism, and their efficacy, benefits, and potential challenges in the context of Bangladesh.

The Global Technology and Tourism Context

Several the Internet backed opportunities and platforms to reach a large number of potential guests, travel industry has made it possible to utilize it to the maximum. For a potential traveler in today's society, you cannot even imagine his or her travel making behavior without the influence of technologies and of course the Internet based resources to bring dreams in reality. The very fast tech that usually seems most significant for tourism industry current is mobile technology. The handheld devices lead a tourist in the whole buying process of travel services. Starting from the information search to the post travel activity of a person is shared by this module with the help of internet. Sometimes, this technology helps in guiding the traveler using online map and works as guide for the new comers at a certain destination. The capability of exhibiting destinations or travel services through the augmented reality before physically present there, has added a new dimension to this sector. The Internet has played a key role in delivering the real time picture through this technology (Fig. 16.1).

Again, many hotels and tour operators adopt services for their guests by establishing The Internet of things (IoT). For managing the in house services such as air control in a hotel property, there are such facilities are created with the help of internet. The destination's weather forecast, looking for directions of place and sometimes other necessities required in travel period are guided by the virtual assistants with the help of internet. The analysis of market and understanding the potential buying behavior of consumers has urged the importance of examining large number of data about consumers. The travel service providing companies have been using big data technology to meet their goal of market study and eventually design their business strategies. Payment procedures have reached to a stage where it has
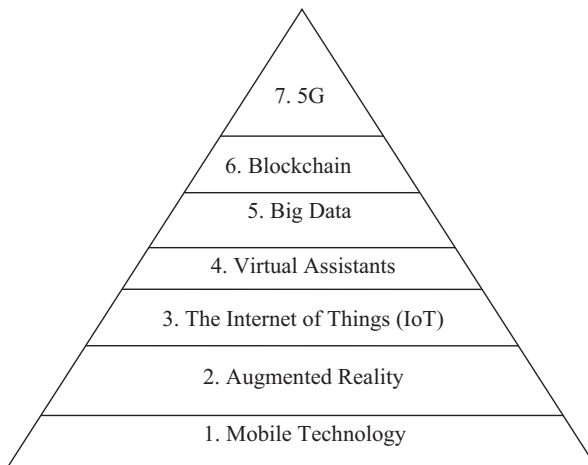
Fig. 16.1 The Internet based techs used in travel industry. (Source: adopted from Wearemarketing, 2019)

been assuring travel oriented people to make their transaction secure and easy. Blockchain is such a growing payment methods helping tourists and also passengers to deal with their travel buying process. Another significant improvement which has happened with the introduction of 5G and therefore, today the Internet has lifted new possibilities for the undiscovered places to be travelled in future. So, these technologies with the help of the Internet are helping both the suppliers and consumers of tourism products and availing new opportunities for them. Apart from these technologies, there also will be some platforms for the tourism industry which have already gained popularity among the stakeholders. The next section experiments the scopes for travel and tourism industry on the Internet and some relevant examples.

Technology Usage Among the Tourism Stakeholders

Tourism is such an industry where the direct and indirect involvements of different sectors formulate the service provision model. As we have discussed earlier in the previous section that the enterprises are solely engaged with the Internet to reach the potential customers and deliver them the expected value. This industry is not out that conception of being driven a lot by the internet. Tourism requires a vast number of suppliers in creating values for the tourist and it projects the requirement of the Internet connectivity in their every operation (Fig. 16.2).

This industry is not out that conception of being driven a lot by the internet. Tourism requires a vast number of suppliers in creating values for the tourist and it projects the requirement of the Internet connectivity in their every operation. The tourism industry has several sectors connected with it directly or indirectly and they are communicating and even designing their strategies with the help of internet. The traffic over the Internet has brought the marketing concept to be digitalized from dawn of technological revolution. The attractions or the destinations are the main
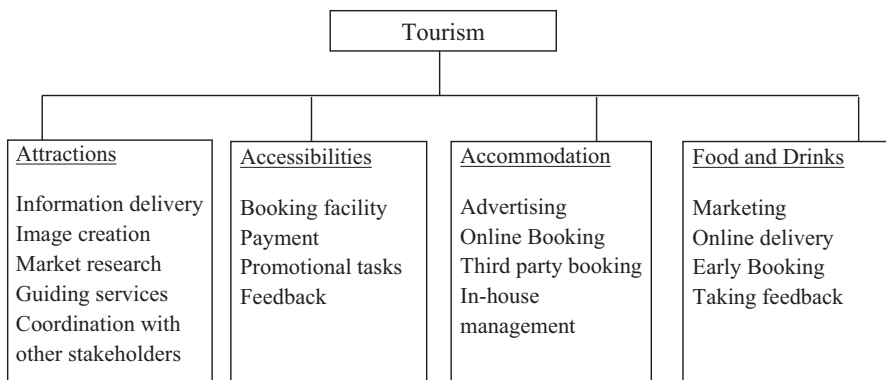

Fig. 16.2 Basic tourism components and the Internet uses. (Source: the authors, 2020)

product of tourism and depending on it other sectors usually come up with their services. To sell the destinations, there are various groups from the national government to local or regional tourism authorities work with the tour operators and travel agencies. The presentation of the destinations and useful information delivery remains a significant task for these groups where the Internet played a pivotal role in attaining the goal. The modes of transports mostly use the Internet platform for their promotion and also to bring the booking options for the prospective travelers with online payment facilities. Here, the confusion of the travelers about the service of the supplier can be easily verifiable through some dedicated sites comparing service quality of numerous enterprises at a single platform. While the accommodation sectors have their customized transactions and service maintaining systems run with the aid of the Internet facility. Starting from the booking to payment and even the in house services are controlled through the Internet using dedicated systems. The most popular places to eat and try the local cuisine at destination become a quite interesting factor for a large number of tourists. To deal with it, these establishments have their own system to guide their potential guest to enjoy the service they desired. Apart from these components, tourism sector includes the entertainment and amenities providers those who are engaged in attracting tourists to participate through different promotional campaigns. So, the industry is largely depended on the Internet facility in recent time to deal with the tourists to fulfill their every need from selecting a destination to providing feedback on services they used.

How Does the Internet Affect Tourism Business?

So, the online platforms ensure benefit for both travel companies as well as the consumers to get their best options. The growth of online based marketing among the travel service providers has shown that the key driving forces for the industry to attain consumer attention remain in the Internet movement. Some of those platforms are examined and how this are connected with the stakeholders of this industry. Starting with the websites, many services providers such as hotels, airlines, tour operators have their own customized websites offering products and services for the potential guests. Later, there are different third parties specifically known for reviewing the experience of the true visitors who previously travelled in different places. These review websites are committed to provide some loyal tourists which motivate the services' suppliers to invest their effort on those sites. Apart from this, the Google services sometimes help in the companies' promotional goals to be achieved through search engine optimization where the companies pay the Google to place their websites first on search list and thus allure visitors' attentions (Fig. 16.3).

Airlines and hotel industries use third party booking and reservation to meet their objectives using internet. On the other hand, the car rental companies are also using the online platforms to sell their services. These platforms require resources to boost business for a particular company. But in the individual level, companies try

Internet

Own Websites

Review Sites

Booking sites

Social media

Google services

Hotels,
Airlines,
Tour
operators,
Car Rentals
etc.

Selling
Tours

Getting
Feedback

Purchasing tours

Sharing opinions
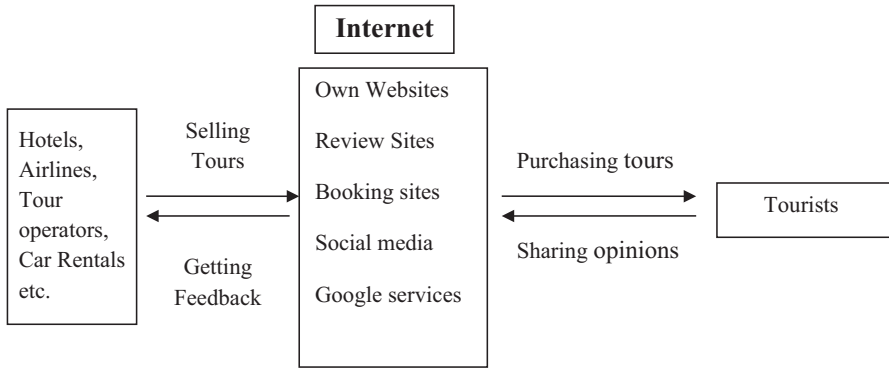
Tourists

Fig. 16.3 Engagement of tourism stakeholders over online platforms. (Source: the authors, 2020)

to use their own effort through different platforms of social media to market their services and aware the potential guests. The attention of this chapter is on the use of social media by this travel industry's stakeholder. Social media has evolved as a powerful tool for the businesses to reach at a niche level whereas the consumers get liberty in expressing their authentic opinion on their likes and dislikes.

The Introduction of Web 2.O and the Social Media Evolution

Web 2.0 has been introduced as an influential technology for the Internet stakeholders to use it in such a way with the aid of World Wide Web where it is not confined in just sharing contents for the readers. This technology provides advancement in interaction through collaborative approach for the Internet users to response and provides their opinions without any obstacles (Kaplan & Haenlain, 2010). Earlier the contents which were shared by the Internet page owners centralized in nature where it was only possible to read for the visitors. The introduction of Web 2.0 has formulated a new way for the users to react and share their views and thus formed the new social networking sites known as social media.

Social Media

Social media and its various platforms possess an influential thrust on the behavior of stakeholders in our society. This rule of thumb is also applicable for the tourism industry. Before diving into the aspects of social media involvement in today's life, it is necessary to discover the journey of social media. Social media in today's life has created a new dimension in keeping the relationship among people virtually which once depended solely on physical interaction and other long distanced

communication tools such as telephones. At the very beginning to understand the concept of social media and how it really works, it is a prerequisite to keep eye on the development of social networking. Social networking is often defined as dedicated platform where the user can easily share his or her contents and sometimes get the opportunity to avail different jobs (Green & Quigley, 2010). The development in technology has provided a vital advancement for the social networking sites to flourish like other tech based innovations (Edosomwan et al., 2011). The journey of social networking was started back 1700s with the introduction of telegraph where it used to be a component for messaging and social networking (Ritholz, 2010). So, the today's world has been experiencing social media as one of the convenient tool for using it as a networking sites where the Internet is used as a medium to connect. On the other hand, social media has also recognized to the business people to draw the attention of their prospective consumers and thus establishing their brand names through engagement of people virtually (Schauer, 2015). The sharing of audio, video, picture and message has molded the culture of social media to be placed as a transmitting power and completing the communication purposes through electronic medium (Seth, 2012).

It is noteworthy that the virtual communication has given us the most fasted interaction facility where information reaches to every corner of the world outpacing the border limitations. So, today it is not essential for anyone to take decision on their own after having prior experiences form previous users leaving their reviews and comments. The word of mouth communication sets a standard for not to have physical interaction now a days and it has propelled a further distance with the introduction of social media. Social media is an online platform where it diminishes the boundaries among people through sharing their thoughts, feedback and motivates people to comment for information sharing (icrossing, 2008). Social media is looking for such an interaction platform to connect consumers where the contents are generated by the users; the user developed websites and finally based on social software (Fotis et al., 2012). For the business owner, it is notable that they have a different understanding of social media. In this extend, it is defined that social media is an effect instrument for the marketers to create contents by themselves at a lowest cost while promoting those to their potential consumers with a lesser cost and even free sometime to introduce a conversation stage (Levinson & Gibson, 2010). Applications and websites which are generally enable people to share their own contents and comment on others' sharing material recognized as social media (Stevenson, 2010). These user oriented contents and materials which are shared on social networking sites known as social media can be in different forms such as audio, video, written etc. This growing platform with the advent of web 2.0 has upgraded to a version where it has been regarded as a tool for mass communication with wider consumer base (Hanna et al., 2011). The Internet has played a vital role in forming social media to reach each individual over the Internet and allow them to provide easily their opinions from their gathered experiences in the past to influence others looking for same experience in future (ClickZ, 2006). The opportunity to encounter new knowledge from various sources on social media has helped a lot to the prospective users of certain products, brands and services to develop credible

impressions which they are looking for (Blackshaw & Nazzaro, 2006). This the Internet based platform has been established on technical foundations and Web 2.0 development where it allows users to share their own contents (Kaplan & Haenlein, 2010). Thus, Cohen (2011) conducted a research on social media that identified three basic characteristics of social media after examining various resources on it; first, social media platforms usually operate over online thus require information technology. Second, it is a place where the contents are not centralized which means there are options to criticize on other sharing contents. Finally, these platforms create a new world where the non-physical interaction can be influential in changing behaviors.

Social Media Platforms

There are several platforms dedicated for communication purposes and works as social media stage for its users. Social media has formed different platform based on the purpose of use such as some of them establish online communities, some are engaged in review sharing, and some are used for content sharing (Fig. 16.4).

Apart from the below sated platforms, there are numerous social media platforms used for content sharing. But the recognition and credibility of these platforms sometimes establish a standard for mass use which is applicable for a limited
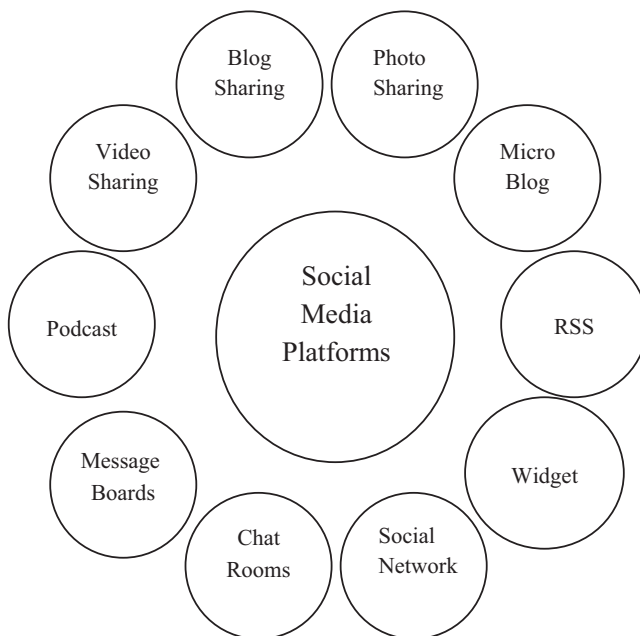
Fig. 16.4 Key social media platforms. (Source: adopted from Universal McCann, 2008)

number of platforms. Basically the social networking sites are quite common to the general users as social media platforms such as Twitter, Facebook, YouTube, LinkedIn and Snapchat etc. Again the advancement in mobile technology and the Internet expansion has concluded more sophisticated ways to use newer forms of social media platforms. And the availability of smart phones and other technical tools has made the use of social media simpler and effective. The previous study on social media platforms shows that the Facebook and WhatsApp have the most social media users worldwide (Ly & Ly, 2020). So these platforms are basically classified on the basis of video sharing sites, blogging, picture sharing websites and sometimes micro blogging (Gretzel & Yoo, 2013). So, social media platforms are recognized today as an efficient tool to reach a large number of people at a very short period of time and provide opportunities to disseminate information to the mass gatherings. The business world and even the celebrities have been using these platforms to reach their targeted audiences to pass the information they want (Ly & Ly, 2020). The larger fan base in the social media platforms has driven the marketers to understand the consumers and their buying intentions. So, these platforms basically have been playing vital role in dealing with mass population for any individual, organization and industry.

Social Media and the Tourism Industry

At the individual level, people all around the world are being controlled by the presence on social media as they get influenced by others' behaviors and experiences on these platforms. The buying and selling culture has also been encountered effect from social media as consumers are connected on these networking sites (Adams, 2012). The popularity of these platforms has made it possible for the future tourists to look for the required information on destinations, services and other product features because of voluntary experience sharing by the pervious users (Buhalis & Foerste, 2015). The development of Web 2.0 has given the rights to the potential travelers to experience a collaborative platform where they can easily get the information shared by other travelers. The information from the travel person thus gets more attention than the professional advice in recent time and people are expressing more interest to follow the experienced travelers (Fotis et al., 2012). Some of the tourism researchers have concluded the relationship between Web 2.0 and tourism through a new segment called Travel 2.0 where the travel industry is defined from the perspective of social connectivity among people. Travel 2.0 is such a technological enhancement runs with the help of the Internet and information technology where the control of it totally enacted to the individual user. So, these platforms are not only creating new customers for travel businesses through recommendations of fellow travelers but also influence the business strategies of travel enterprises and destinations (Milano, et al., 2011). The travelers now-a-days are more depended on the Internet based sites for their travel decisions and the word of mouth of past users helps them to make their final step towards purchasing. The invention of social

media as a social networking site has brought changes in the way travel stakeholders engaged in tourism activities in the past. The organizations those who are involved in delivering travel services have to bring changes in their strategy to reach the potential consumers (Xiang & Gretzel, 2010). The traditional information search for travel planning from travel advisors such as travel agency or tour operator has replaced by the social media in the form of Facebook, blog and even sometimes micro blogs. The platforms like Twitter, Facebook and YouTube are popular place for the consumers to share their prior knowledge they have earned during consumption and it also ensures a more efficient way for marketing platform from travel businesses (Tran and Do, 2017). Hospitality industry and its all stakeholders are benefited in their own environment from the utilization of theses social networking sites. These platforms often provide opportunities for the users to weigh their service experience through review and thus have a strong influence in affecting the image of any service providers. Sometime the information about products which are provided by the respective authorities outplayed by these social media platforms and these are more trustworthy to the consumers (Starkov, 2008). From the marketers' point of view, it is also proven that these marketing platforms are more cost effective and reliable to reach the prospective consumers. Even there is no need for these enterprises working with travelers to invest further for physical establishment to engage into these platforms. Travel businesses like hotels and airlines are creating more buzz on social media in dealing their customers where the review and rating from consumers play a vital role for company's reputation (Kasavana, et al., 2010; Tran & Do, 2017).

Social Media Platforms for the Tourism Industry

All social media platforms are not equally significant for both tourists and marketers. The demand of this industry has created opportunities for some of the platforms to be more influential for tourism stakeholders. The use of social media and facilities provided by the established platforms set the suitability in choosing the right one for the industry. The traveling community basically engage in social media for certain purposes such as information gathering, collecting other tourists' experiences and finally delivers honest reviews on their visit to places. So, these objectives are the main standpoints for the users in travel and hospitality industry in selecting social media platforms. The below Figure shows the real picture social media use to meet the demands of tourism participants to establish a virtual community (Fig. 16.5).

Several studies have done on the use of social media platforms to find out the efficiency among these platforms, thus providing marketers scope for their strategies to be influential to target the potential consumers. The common form of social media platforms for travel industry involve review sites, social networking sites, media sharing sites, media page sites and finally corporate websites of service
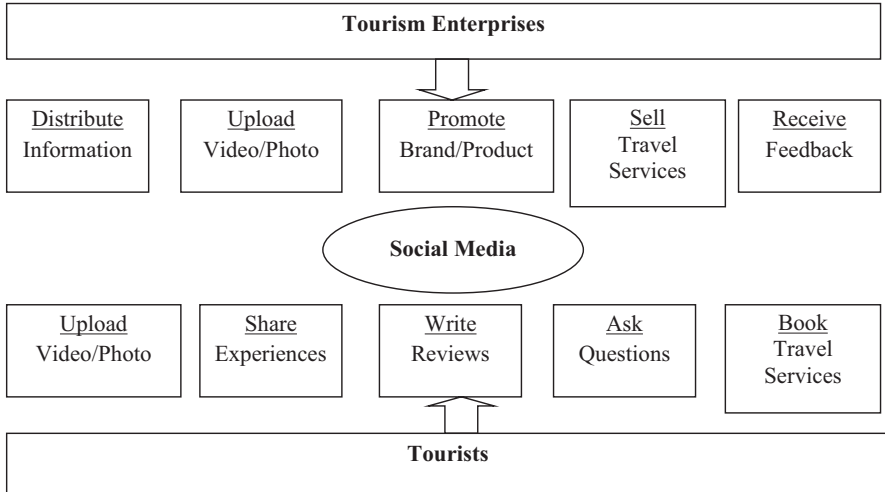
Fig. 16.5 Social media in travel and tourism purposes. (Source: adopted from Gururaja, 2015)

providers. A study data (Tran & Do, 2017) has concluded that the use of social media for tourism contenders are mainly confined in the below parameters.

Tourists and Guests Review Sites

The review sites such as TripAdvisor, Lonely Planet along with other online booking platform like Expedia offer a wide range of services for both the future travelers and promoters. These platforms provide the facility to compare quality and prices among various services and also attain experience from the shared story of fellow consumers.

Individual Travel Blog

Travel Bloggers who are basically involve in full time travelling across different destinations have a wide follower base and can influence the decision of potential travelers. In recent time, these people are also selected for promoting tourism products and services. They often collect information about places, gather photos and videos, and finally come with a final content combining various sources (Cox et al., 2009).

Social Networking Sites

Facebook and Twitter are common forms of social media platform for developing virtual community in the Internet world. Apart from these sites the tech enabled communicative applications are responsible in influencing the behavior of the travel markets.

Media Sharing Sites

To attain the mass reaction or reach the ultimate users, the media traditionally remains one of the major promotional tools for the enterprises. But the introduction of Web 2.0 has opened an interactive media platform where the marketers and consumers both can leave their opinions. Sites like YouTube and Pinterest are contributing to spread information and reviews in the form of videos and photos respectively.

Modern Day Tourists and Social Media

Tourists always find social media as an essential tool for them to acquire knowledge and information what they require for planning future travel plan. Because social media is a place where the tourists can provide their valuable thoughts and attained experiences through different forms and it helps a lot for the potential travelers to take right decision while traveling. The evolvement of social media platforms has brought changes in the marketers' customer management strategies while offering new business model like customer to customer interaction in influencing travel behavior (Li & Wang, 2011). On the other hand, the travelers are now more confident and feel independent in arranging travel requirements on their own since the information from fellow travelers seems reliable and trustworthy to them than the traditional procedures. It is found that the prospective tourists are more often rely on travelers' experiences shared on social media platforms and consider beneficial in reducing uncertainties (Buhalis & Jun 2011). Tourists need lot information about the facilities and services they require during a trip. Most of the tourism products have one common characteristic which is the intangibility and this put a high risk factor for the travelers in decision making. So, it is obvious among the travelers to ask for information from other traveling experienced the products or services before to reduce that uncertainty. Here the social media platforms are giving people opportunities to watch and read the comments or reviews of the fellow travelers about their journeys and become one of the major information sources of information for today's tourists (Gros, 2012). The rapid use of technological equipment among travelers and the wide spread of the Internet set a new dimension for social media to
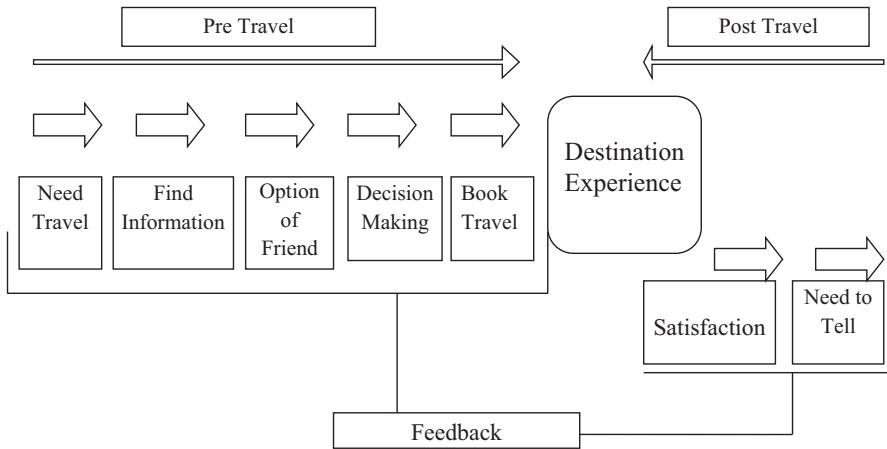
Fig. 16.6 Process of traveling experience. (Source: adopted from Bank, 2015)

melt with the travelers' journeys. It is even possible to postpone the travel decision after watching any information negative from social media (Fig. 16.6).

The organizations and enterprises those who are working to promote tourism seem to be less reliable in terms of authentic information provision than the independent traveler's experience (Roque & Raposo, 2016). The accommodation sector is influenced at a higher extend from the use of social media as most of the guests depend on the ratings and reviews of previous guests to select any option (Fortis et al., 2012). Again the tourism industry has confronted trend from the travelers to purchase travel arrangements over social media in recent time. Studies have found that the purchasing services include accommodation facilities, air tickets and sometimes the entrainment services at the destination area. In this transaction process, tourists can easily skip the middle man and directly contact to the ultimate service providers on their own to get the best deal. So the process of buying from social media and delivering experiences on different platforms about the services work as a motivational factor for other tourists in travel planning. The above Fig. 16.6 shows how the travel process actually works. Social media today has a significant amount of influencing capabilities in these stages of travel experience. Travel experiences on social media help travelers to get quick entry, avail opportunity to compare any products from different opinions and benefit of deciding alone.

Social Media as an Information Source for Tourists

The nature of the tourism products is totally different form the traditional products. Thus, it requires more attention backed by credible information to make the final decision for the consumers of travel products. Information remains one of the major considerations for the travelers when planning for a trip.
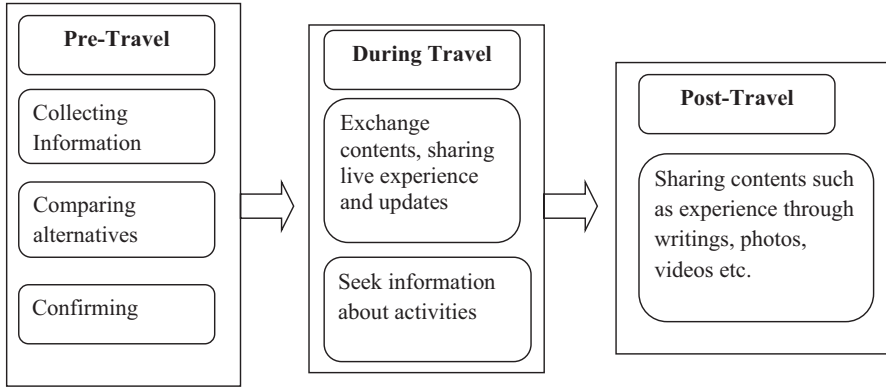
Fig. 16.7 Information movements during a travel making process. (Source: adopted from Manyevere & Kruger, 2019)

The lack of physical proximity of these products creates an uncertainty among the potential users. This scenario demands for an extensive analysis of information on a particular product to verify the difference among the alternatives (Manyevere & Kruger, 2019). The primary sources of information to meet this requirement are basically from family members, friends and fellow tourists. It is often seen among the travelers that they usually drive for information to their family friends for visiting popular destinations while the undiscovered visit plan requires secondary information search (Jenkin, 2010). The Fig. 16.7 presents a state of understanding of information for the travelers in different state of travel time span. Social media has been delivering information for different stakeholders connected with tourism during these phases of travel. This scenario really urges the necessity of putting more emphasis on the social media platforms for designing business models for enterprises.

Tourists' Decision Making and the Influences of Social Media

Today the Internet and its features have become part and parcel in our daily life. Travel has also been influenced from the dawn of this technological development. The normal nature of travel industry in buying and selling of tourism products has changed a lot because of the social media. And this scenario has also brought changes in the tourists' decision and travel plan (Leung et al., 2013). The availability of information and smooth access has made tourists to become more independent in their travel decision. Social media helps tourists to gather information, make purchase, share experience over online platforms without any interventions by others. Thus it provides travelers to establish a holistic understanding of a particular destination or product backed by other travelers' experiences. So, social media today is responsible for the new trends among travelers in deciding on travel plan

and thus influence the promotional and marketing activities operated by the marketers. Travel planning process is usually a combination of certain stages where tourists dream about their future destinations and end with creating some memories. Decision making is defined as the "process and action of making important decision" (Stevenson, 2010). For a tourist in this case, it involves taking plan to visit a location or develop a travel plan. The whole process of finalizing a decision requires information, assessment of alternatives and lastly measurement of values from the travel. A typical customer and his buying process often involves five stages where it starts with the evolvement of a specific need and ends with some feedback based on the consumption experience. The below Fig. 16.8 offers an understanding of consumer decision making process for any product or service.

Traditionally, the tourism products are basically gone through these stages with the help of travel consultants such as tour operators or travel agents. But the social media has empowered the modern tourists to make their decisions on their own. And it becomes possible only because of the opportunities being provided by the social media platforms. A popular decision making model for understanding the process of travel plan is known as "three phase" model. These phases are pre-travel, during travel and post-travel responsible for travelers' travel plans (Engel, et al., 1990). This theoretical outline defines the major stages in tourists' decision making (Fig. 16.9).

The early stage of buying any tourism product requires information about that product. In this case, there is an opportunity for the prospective customers to engage in interaction with the previous buyers and form an understanding about the product though a collaborative approach. But the latter two phases in travel decision often confine in sharing opinions about the products. The pre travel stage gives tourists task to accumulate constructive information on various destinations and also directs to finalize the destination comparing the alternatives. Social media helps tourists in generating this information and establish a standard for them to set expectation from a place before the actual visit. At the destination, tourists usually dive into the actual observation of the product or service and try to enjoy the anticipated experience. Lastly, the post trip phase will guide the travelers to develop a conclusion combining his perceived expectations and provide an actual feedback. Social media platforms are directly or indirectly influence tourists in these three phases. Because when someone tries to find information on the Internet platforms, social media becomes one of the major sources for the information seeker. The increase of online platforms where the contents are being generated by the travelers by themselves has made it trustworthy and credible for the newer travelers. The most common form of information source during the early stage of travel is word of mouth communication and social media delivers diversified platforms to have such experience. Since the

Problem Recognition → Information Search → Evaluate Alternatives → Make Purchase → Post Purchase Decision
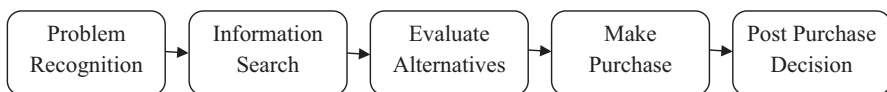
Fig. 16.8 Consumer Decision making process. (Source: adopted from Kotler & Keller, 2016)
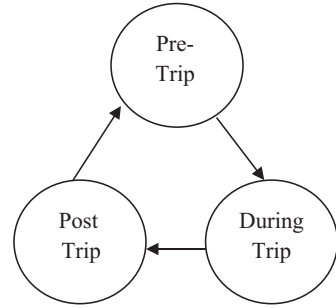
travelers are independent and free to provide their own opinions, there is no commercial influence in information provision. At the destination, travelers may require suggestions for on premises services and entertainments. Social media often provides up to date information to meet this demand.

The culture of sharing experience in a story format during the travel on these online platforms makes the prospective travelers to visualize the travel experience. The post trip feedback and experience have a higher capacity in influencing future travelers to plan their itinerary. From this discussion, it seems that the travel decision making process is a circular process. And the elements on this process can be affected by the social media platforms at a significant extend. But the influence from social media has made the process a linear one (Dwityas & Briandana, 2017). In the below model (Fig. 16.10), it is shown that the travel planning phases follow a linier process in correlation with social media where it starts with the response from the shared contents and ends in sharing own opinion after making the trip. But the behavior of tourists in making travel decision sometimes differs in respective of the segment of tourists. Apart from this culture of decision making, travel decisions can be different in terms of travelers' types. For example, the people who are usually travel to operate corporate meetings; they usually have little control over selecting the transportation and accommodation. The company most of the time organizes the necessaries for employees. Sometimes, there are some differences where the business travelers have the opportunity to make their travel arrangements on their own supported by the organizations. The social media platforms which are boosting tourism growth are often controlled by some of the specific travelers having an enriched knowledge about the travel. It is found that the backpacker travelers are mostly influenced by the contents of social media (Zeng & Gerritsen, 2014).

Social Media Practices Among the Bangladeshi Tourists

A recent study from 2018 has included the impact of social media in Bangladesh tourism. The project has laid some of the facts and figures about the trends in travel industry regarding social media uses. With the increase in networking capability and easy access to technological gadgets has made it possible for the general people
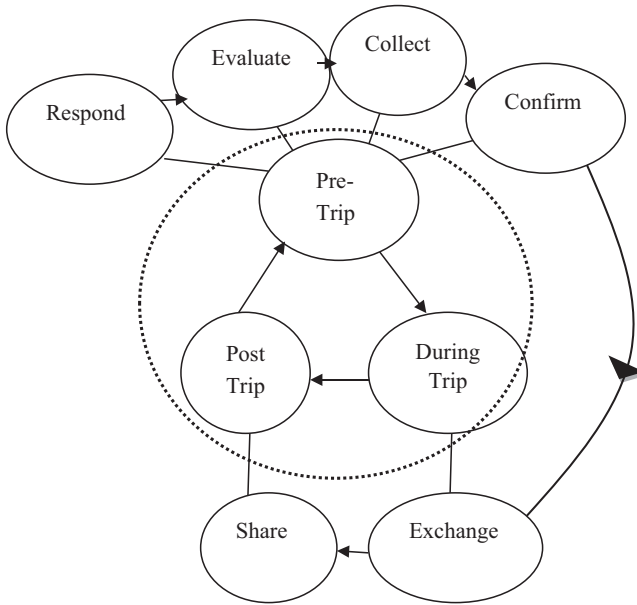
Fig. 16.10 Social media in travel decision making. (Source: adopted from Dwityas & Briandana, 2017)

Fig. 16.11 Information sources used by Bangladeshi travelers. (Source: Karim, 2018)

Websites 15.57%
Newspaper 7.74%
Family and Friends 16.60%
Tour Guide 7.36%
Social Media 42.74%
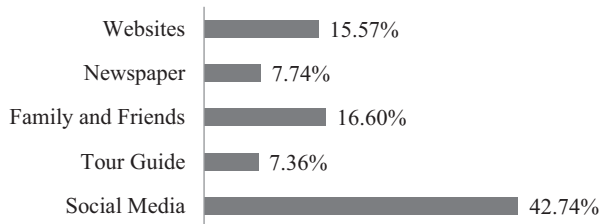
of Bangladesh to engage them to the virtual world. The below statistics is showing how the travel loving people has moved to these online based platforms for acquiring knowledge about travel products and services. There are different platforms engaged in providing travel services, but the tourists in Bangladesh basically follow the known platforms such as Facebook, YouTube, Instagram, Twitter and LinkedIn (Fig. 16.11).

Among these, the availability of features and user friendly controlling have made Facebook popular among the Bangladeshi tourists in terms of getting information, making purchase and sharing contents on travel experience (Fig. 16.12).

Information on hotels and hotel rooms' rate, destinations and restaurant facilities remain on the top list in using social media for tourism purpose in Bangladesh. A study has found that most of the domestic tourists in Bangladesh are influenced by the posts on social media platforms in selecting a particular destination (Kamal, 2017). Apart from this, the same studies have also revealed that more than half of
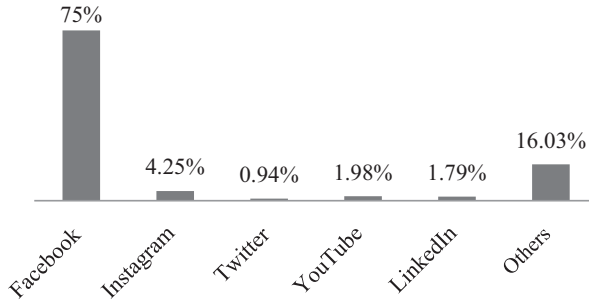
Fig. 16.12 Social media platforms used by Bangladeshi travelers. (Source: Karim, 2018)

the tourists in Bangladesh are likely to share their experiences through providing photos, videos and sometimes story. The traffic in the Internet which is generated from Bangladesh in recent time calls for new development in strategy for the travel service providers to reach the potential consumers. As a social media platform, YouTube is responsible for a higher engagement of people. But this platform is not applying to the fullest by the both marketers and travelers to influence travel making decision.

Opportunities and Issues from Using Social Media in Tourism

Social media platforms are not only working as an influential tool for tourists' motivations to take travel decisions but also helping the service providers along with the related tourism stakeholders to place their roles on those platforms. This allows the industry as a whole to operate on a virtual platform for effective interaction. The nature of such communication ensures the liberty for each individual connected and raises sensitivity of information at the same time. Travel and tourism industry is now on such track where the technological development and information system's improvement directly or indirectly the functions with this sector. Some of the advantages and issues from social media platforms which are essential for this industry's stakeholders to understand.

The benefits from these platforms are: first, it is easy to provide complex facts about any destination prior to travel. Second, it constitutes an interaction point for tourists, service providers and authorities. Third, it helps in introducing new distribution channel for the industry. Fourth, enables tourists to arrange all the requirements by them to make the travel. Fifth, allows tourists to interact with fellow travelers. Sixth, serves as an information hub for all stakeholders. Seventh, provides fast and broad flow of information for the marketers to promote their brands. Eighth, facilitates to purchase online comparing various alternatives. Ninth, delivers economical and effective promotional tool for the service providers. Tenth, provides buying opportunity directly from the actual service providers. Eleventh, creates

feedback ground for the marketers. Finally, empowers tourists to make their decision on their own.

Apart from these advantages, these platforms can be responsible for misinterpretation in some cases. So, there will be some issues which may arise from the use of social media. Most of the time, the languages used for interactions may not understandable for mass people. The inability of websites often fails to provide exact information. Negative reviews and ratings from tourists can also be influential for the potential tourists' decisions in selecting a particular product or service.

Conclusion

The evolution of social media platforms provides opportunities for the tourists to engage in a two way interaction process where they can provide their opinions, reviews and at the same gather information to make their travel plans. This is not only enabling people to share their experiences when feel satisfied but also to empower them in evaluating alternatives. These platforms help potential travelers to manage their travel arrangements in a fun process where the interaction with the previous travelers lessens the risk in purchasing the product or service. Sometimes, the written photos and shared photos by the actual travelers create dreams among the readers to become potential travelers. The Internet and informational development is also responsible for the quick spread of these platforms. The development in ICT can increase the use of the Internet among the citizens and subsequently involve people in social media platforms. The destinations can also be promoted through these platforms and ultimately reach to the end users. For the enterprises, these stages can be worked as a significant channel for operating their marketing strategies. Such technological development helps in introducing new destinations to the traveler lovers than traditional promotional tools. So, Bangladesh as a potential destination country must engage its activities on these platforms to get wide spread. Social media here can influence in selecting destinations for the future travelers.

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Part VI
Sustainability Practices and Climate Change Effects

Chapter 17
Exploring Climate Change, Technology and Sustainable Tourism Nexus in Bangladesh

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Abstract Climate is probably the most buzzing word of the recent decade that has been able to manage attention of considerable number of researchers and academics. In reality, as the typical nature of salinity, snowing, rainfall, stream flow, evaporation, draught and relevant are affected by climate warms. All these comprehensively lead to affect both the supply and quality of natural tourism resources and result to unpredictable weather and pollution in the destination's vicinity. Countries lying within the closer proximity to the sea and ocean are taken as vulnerable to experience the ill effects of global climate change mostly. However, this can harm almost all of the areas of the economy including tourism of a country like Bangladesh. The effects of climate change are researched mostly from the scientific perspectives. Surprisingly, such effect analyzes are mostly left unattended for tourism. Thus, the aim of this research is to analyze the effects of climate change in the tourism industry of Bangladesh. The study based on primarily extensive literature review and secondary data also explores the indigenous knowledge and practices of the locals engaged in tourism business in Bangladesh. Besides, any possible application of technology that can nullify the ill effect of climate change is also addressed. Findings show that, among many tourism destinations, the coastal tourism business enterprises and age old archaeological sites in Bangladesh are the most prone to global climate change effects. This research finds that since the national economy of Bangladesh is partly tourism relied; the ill effects from such climate change might possibly be the minimum. The research suggests addressing indigenous knowledge and practices in the national action plan of Bangladesh to tackle climate change effects for ensuring sustainable tourism development in Bangladesh.

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Introduction

Research and understanding on climate change and tourism have recently become a crucial and contemporary issue causing great concern in the field of sustainable tourism (Fang et al., 2018). In particular, tourism is a vibrant industry that contributes significantly in shaping human living standards and improving the social, economic, political, and cultural conditions of a nation (Nooripoor et al., 2020). Plenty of scenic beauty and natural attractions have given Bangladesh a unique status in world tourism (Pramanik & Rakib, 2020a; Rakib & Hassan, 2020b), although its prospect is still overlooked and thus, the industry faces numerous challenges (Mondal, 2017). It is a rapidly booming service industry, regarded as the mainstay of long-term development due to its economic significances (Faber & Gaubert, 2019), particularly in developing nations like Bangladesh. However, despite noteworthy socio-economic importance, tourism is one of the responsible elements for environmental pollution and degradation, producing CO_2 and causing the greenhouse effect (Jenkins & Nicholls, 2010; Kitamura et al., 2020; Lenzen et al., 2018). Moreover, tourism performs a wide variety of activities that have a devastating effect on environmental and ecological systems (Nilsson, 2019; Perkumienė et al., 2020).

On the other hand, another growing apprehension is now the effect of climate change on tourism, tourists and the destination's environment. Primarily, climate change significantly impacts tourism, the world's largest industry, by influencing travelers' intention towards destination choices (Hamilton et al., 2005). In this connection, a pleasant climate can induce visitors' attention and form positive visitors' attitude and behavior as tourism is a global industry relying heavily on climate (Amelung et al., 2007). In general, the constantly changing nature of climate may either directly or indirectly impact on various aspects of the tourism industry, notably attractiveness, availability of facilities and accessibilities (Braun et al., 1999). For example, the nature-based winter tourism's existence is threatened due to unusual behavior of climatic change (Moser & Baulcomb, 2020; Scott, 2003), through extended summer or monsoon. Thus, tourism destinations like coastal and mountain regions that essentially depend on natural, cultural and historical heritage and relevantly the economy that mainly relies on tourism, seems to experience the greatest risk and vulnerability (Wall, 2007). Over nearly two decades, the scientific literature begins to explore the relationship between tourism and climate change and their effect on each other, which has become a subject of interest to researchers (Dillimono & Dickinson, 2015; Dinca et al., 2014). Despite being tremendously

worthy and valuable, the study explaining the terrible consequences of climate fluctuation on the tourism industry is minimal and rare (Ma & Kirilenko, 2020), and the vulnerability of this socio-economically significant industry is not appropriately evaluated and adequate mitigation and adaption measures are suggested and initiated yet (Ruhanen & Shakeela, 2013; Scott, 2003).

To control and manage adverse consequences of climate inconsistency, sustainability is a widely discussed subject matter in the research literature (Kasemsap, 2020), which focuses on economic, environmental and societal issues and achieves much attention of policymakers and academia (Grigoroudis et al., 2012). The notion of sustainability has emerged in the tourism industry to solve difficulties and overcome challenges (Kasimoglu, 2012), including tackling the adverse impact of climate change. For ensuring sustainability in growth, technological innovation's uptake can respond effectively to climate change effect by efficient resource usage and wastage management system without hampering ecological harmony (Ferreira et al., 2020). In this regard, sustainable tourism occupies an essential part of the global tourism industry, which simultaneously positively impacts the environment, economy and society and encourages long term, sustainable growth and empowerment of local inhabitants and destinations (Kasemsap, 2020). This chapter aims to investigate the interaction between the tourism industry and climate change impact. The chapter highlights the necessities of sustainability in tourism development and plan to suggest some courses of action to address these issues.

Climate Change and Sustainable Tourism

Tourism is a basic phenomenon that holds a central place in the literature and gains academia and researchers' key attention (Yuhai, 2010). Economic importance of tourism is getting much more attention than ever before to the practitioners and policy planners in developing and developed countries due to tourism's enormous contributions in GDP growth and even in Balance of Payment reconciliation (Kasimoglu, 2012). In many economies, tourism relies on the climate, acts as a major economic dimension, and unexpectedly causes significant environmental and climatic changes (Ma & Kirilenko, 2020). Climate change is threatening biodiversity and human life, increasing global warming, raising the sea's water level, triggering hostile weather and causing other natural and environmental disasters (Levy et al., 2017). Thus, scholarly concentration to depict the relationship and association between climate change and tourism is increasingly recognized among the stakeholders of this sector (Becken & Hay, 2007). To overcome environmental challenges, the issue of sustainability has moved to an established and accepted research area and has proven to be a ground of significant research activity (Kasemsap, 2020). Because sustainability notices and meets the existing needs in such a way that preserves and leaves the resources to fulfil future generations' necessity and thus ensure the economic, social and ecological harmony (Grigoroudis et al., 2012).

Thus, ensuring sustainability in tourism and hospitality management's activities and events becomes a time demanding reality.

In the tourism industry, the economic significance of travel, tour, entertainment and leisure activities in line with the probable environmental consequences, introduces the idea of sustainable tourism (Berno & Bricker, 2001). Sustainable tourism may not be viewed as a distinguished and special form of tourism; instead, all kinds of tourism should be transformed into sustainable tourism to mitigate and manage the negative impact (Perkumienė et al., 2020). However, the study on sustainable tourism is hardly found in Bangladesh (Mondal, 2017). Recently, the Bangladesh government prioritizes the successful implementation of sustainable tourism policy and concept (Mondal, 2018). However, such implementation plans lies mainly on documents and remains still in its infancy. Therefore, for attaining the goal of sustainable tourism, numerous stakeholder groups including destination management organization (DMO), local and central government, tourists etc. should be cautious in maintaining the harmony of the environment and ecology, culture and tradition, socio-economic benefit and growth, and the empowerment of local inhabitants and destination (Mowla, 2019).

Technology Adaptation and New Height in Sustainable Tourism

Like other industries, the blessings of technology in tourism is also carefully observed, which has brought some groundbreaking impact in this industry including airliners, digital cards, travelers' cheques, and online reservation systems (Kasimoglu, 2012). Information, communication, and technology altogether have the potential to be widely used to accelerate the pace of strategies and techniques in promoting sustainable tourism development and maintenance (Ali & Frew, 2010). By using innovative technological approaches, sustainable tourism becomes an empirical reality that can settle a wide range of economic and ecological problems (Ali & Frew, 2014). Technological growth and advancement bring a radical change in tourism performance and practices; remarkably, the internet contributes greatly to underpinning tourism's progress while assisting properly in implementing sustainable tourism through technological road mapping (Gore et al., 2020). The technology facilitates the changes in the array of sustainability by replacing many aspects of manual tourism and hospitality services seeking patterns by tech-based tourism reservation systems, online ticketing and information collection, the growing transportation technology, wide variety of collective services, easy access to information through the computerized systems, satellite and wireless technology and the rapid use of the internet and mobile applications (Gore et al., 2020). Tourists as consumers increasingly demand to experience a quality environment and eco-friendly and enjoyable vacation, which acts as one of the stimulators to necessitate the extensive usage of Information and Communications Technology (ICT) especially, cleaner

technology that reduces the use of scarce natural resources in tourism (Yaw Jr., 2005). Destinations are to take the very best out of technology in operations, be technically sound, ecologically friendly, and environmentally innovative; otherwise, the degradation of destinations' economy and the environment is inevitable (Ali & Frew, 2010).

In many developed countries, destinations are increasingly using cutting edge technologies like augmented reality, virtual reality, or mixed reality tools to ensure improved tourist satisfaction along with meeting the sustainability challenges (Han et al., 2014; Siang et al., 2019). In Bangladesh, increased salinity, damp climate, excessive flood, acidic rains etc. resulting from severe climatic imbalance triggers degradation of many historical sites in Bagerhat and Naogaon including the erosion of ornamental terracotta, decay of walls and embellishments etc. in Paharpur Buddhist Bihara and Nine Dome Mosque of Bagerhat also create the issue of sustainability (TBS Report, 2020; The Daily Star, 2020a, 2020b; 2007). Appropriate maintenance and integration of the revolutionary technological tools like Augmented reality (AR), Virtual reality (VR), Mixed reality (MR) or Google's 3D scans can successfully mitigate the adverse impact of such climate change and ensure sustainable tourism (Han et al., 2014; TBS Report, 2020).

Sustainable Tourism Towards a Green Economy: Empirical Evidences from Bangladesh

Tourism is perceived to be a major economic developmental instrument and tool in many least developed and developing countries like Bangladesh as it exerts multiple positive influences on the economy and contains huge prospects for employment opportunity generation (Berno & Bricker, 2001). Bangladesh has huge prospects to generate revenues from the tourism industry (Mondal, 2017). In Bangladesh, the tourism industry unlocks the door to sustainable development for the local community members by forming their economy on handicrafts, agriculture, livestock, fishing and other tourism-based professions; the output of which is purchased or consumed by almost all categories of tourists (Anwar, 2012). Specifically, the diversified handicraft products of Bangladesh, namely Nokshikatha (embroidered quilt), cushions, toys, traditional dresses, bags and jewelry, are made from environmentally friendly materials like bamboo, wood, natural fibers, that are in great demand and valued all over the world (Mondal, 2018), which directs the economy towards sustainability through earning huge amount of money every year. In this respect, sustainable tourism has occupied an increasingly important and worthy of attention striking place to the tourism literature for its impeccable contribution (Liu, 2003). Keeping this in mind, a larger portion of tourism literature has concentrated and heightened the understanding of the principles, policies, practices and implementation of sustainable tourism towards ensuring a sustainable economy (Hunter, 1997). Experts also argue that sustainable tourism integrates and considers the dynamic

interactions of nations' economic, social, and environmental empowerment (Fossati & Panella, 2000). Besides, this industry covers a range of vital activities that bring economic, social, and environmental outcomes that can foster the pace of overall economic development (Becken & Hay, 2007). Moreover, sustainable tourism accelerates and encourages economic growth and progress in developing countries (Freytag & Vietze, 2013) like Bangladesh. Hence, sustainable tourism, a fast-growing economic segment, carries huge opportunities to nurture foreign earnings, create employment options and alleviate poverty in developing economies like Bangladesh (Sheikh, 2020).

Despite numerous challenges in implementing sustainability policy at an operational stage, this type of tourism emphasizes on sustainable development (Berno & Bricker, 2001). Sustainable tourism, if properly premeditated, controlled and implemented, can be an enduring source of economic aids to industry actors and an overall economy of Bangladesh (Dabour, 2003). In this way, the drive of sustainable tourism in balancing economic, social, and environmental empowerment leads to construct and demands to implement a green economy system. Because the concept of green economy is considered as the best alternative to balance economic, social, and environmental components, especially for the long-term development of the tourism industry (Yıldırım & Yıldırım, 2020). Scholars describe the green economy as an idea that comes from economic discipline, targets to boost human welfare, emphasizes the conservation of the natural environment, harmonizes the capacity of the environment and developmental activities and tries to ensure sustainability in all areas and segments (Hidayattuloh et al., 2020). It can solve the existing environmental and economic crisis of Bangladesh by establishing economic, societal and environmental integration and connection through community-based approaches (Ahmed et al., 2012). Over the past decade, the green economy concept has attained pace in conducting research and formulating policies, resulting in arranging international programs and spreading national agendas worldwide (Merino-Saum et al., 2020). In Bangladesh, establishing and implementing the doctrine of the green economy is very challenging though the green initiative of sustainable tourism can facilitate community development, social, environmental and cultural preservation, export diversification, creation of SME opportunities, and employment generation (Honeck & Akhtar, 2014). Therefore, the government, the concerned authorities, including other tourism stakeholders, should focus on designing and formulating a comprehensive framework to establish a green economy system in relation to green initiatives of sustainable tourism in Bangladesh. Because Bangladesh has an emerging economy with natural beauty, cultural heritage, environmental attractions and fabulous tourist destinations, which leads to moving forward for its strong potential that needs to be embellished with and sorted out in line with the concept of green economy system.

Climate Change: Challenges and Opportunities for Tourism Businesses

The impact of extreme weather conditions and the fluctuating nature of climate on the tourism industry have not yet been exactly conceptualized, identified and compared with other sectors of the economy (Dogru et al., 2019). Explicitly, climate change has brought new adversities and challenges; although less discussed, side by side prospects and opportunities in tourism businesses (Ma & Kirilenko, 2020). For instance, opportunities such as sunny days in the heavy cold and milder cold in hot summer attract tourists and adversities such as extreme and unfavorable weather that hinder tourism growth. Over the previous few years, climate change has brought some opportunities and created terrible risks for the tourism industry, which may influence this sector, including travelers' satisfaction and even put them at risk (Becken & Hay, 2007; Wall & Badke, 1994). The opportunity will soon turn into risks if it is not availed and utilized properly (Becken & Hay, 2007). Mostly, the tourism-based businesses experience a devastating consequence with climate and weather change in diverse parts, namely continuously falling tourist numbers, safety and security, business activities, and profitability due to heavy rain, storm, flood, and extreme temperature (Chin et al., 2019). Besides, climate change is a probable hazard for both society and business, and thus, business areas and activities at the local level face big losses and perhaps more danger (Brouder & Lundmark, 2011).

In general, the traditional forms of tourism businesses involve primary trade straightly involved in tourism, secondary transactions that assist tourism and tertiary exchanges that work for infrastructural and logistics support for this sector (Berno & Bricker, 2001). In most cases, favorable and supplementary functions accelerating tourism industry performance, especially tourism business growth, are adversely affected by the changing climate, resulting in hostile weather and environmental imbalance, specifically high temperature, storm, droughts, floods, and destruction of the creature, forests, flora, and fauna (Dube & Nhamo, 2020). In dealing with resilience and capabilities, countries with very low-income levels are more helpless to overcome climate change's vulnerability than those with the highest income level (Dogru et al., 2019). One of the crucial reasons is the intention of tourism-based small and medium enterprises and policy makers that are willing to work even with climate fluctuation considering the short-term financial gains and prioritizing profitability, by adding fuel to nature's degradation through over or unplanned tourism (Jenkins & Nicholls, 2010). Therefore, further research on the acquisition and enhancement of knowledge and understanding, formation of strategies, and ensuring their proper implementation may help alleviate the uncertainties and risks that have been created in the tourism industry centering on climate change effect (Wall & Badke, 1994).

Vulnerability of Tourism Growth to Climate Change: An Overview of Regional and Global Economy

Tourism is believed to stimulate new economic activities, contributes positively to balance of payment, generates employment and revenues and impacts gross income and production, and hence it is getting increasing significance in the economy of many countries and serving as a key driver for regional development (Fossati & Panella, 2000). Until recently, tourism-related activities were centered and focused around the industrialized nations of Europe and America; nevertheless, some countries from East Asia and the Pacific, South Asia, Africa, and the Middle East are experiencing a growing trend of enhancing touristic activities over consecutive years (Dabour, 2003). To be precise about the importance of the tourism industry, the Japanese tourism industry's contribution to progress its GDP is more than that of any other sector (Kitamura et al., 2020). In Africa, tourism has been acknowledged as an economic segment that contributes intensely to the employment generation (Kasimoglu, 2012). Many countries, for instance, Vietnam, Laos, Philippines, Africa, Sri Lanka, Thailand, Nepal, and India, have unveiled economic opportunities, promoted the long-term development and improved the quality of living standard, and brought positive changes in the state's overall economy with the successful journey of the tourism industry although Bangladesh is far behind from adequate planning and research on it (Anwar, 2012, Rakib & Hassan, 2020a). Countries like Malaysia and Indonesia have joined the development highway by promoting the tourism industry though Bangladesh is still far-reaching to utilize its full potential for economic development (Pramanik & Rakib, 2020b; Salam, 2014). Likewise, tourism supports the Czech Republic's countryside to strengthen the infrastructural advancement and heighten diversification of tourism-based products and services and sharpen the view of establishing a tourism-dependent service economy (Kasimoglu, 2012). By contributing to the economy's numerous wings, the tourism industry has strengthened the tourist destination area's economic base, revived and enhanced foreign income and exchange, and created employment opportunities in the EU countries (Girard & Nijkamp, 2009). In the same manner, with the third-highest number of tourists globally, British visitors travel to Africa, the Caribbean, India, Central and South America, and many Asian countries, while tourism is thought to be its major import from developing economies (Goodwin, 1998). Furthermore, in some countries of Asia like Singapore, Hong Kong, and Japan, the tourism industry is largely based on activities and events concerning dining at restaurants and food festivals to flourish their economic progress; still, the inverse circumstance is observed in the country of Western Europe like France (Kasimoglu, 2012). Besides, due to the natural beauty and environmental attractions, archeological, geographical, and historical heritage, the OIC member countries observe the higher potential for developing tourism-based economies (Dabour, 2003). However, climate change is oddly affecting tourism and hindering its progress and development by creating vulnerabilities (Perkumienė et al., 2020). Evidence show that, wildlife is affected by growing snow packs and rising temperatures that increase the

frequency of possible snowfall and lead to avalanche death at an alarming rate in Canada (Scott, 2003). The ski industry of some nations typically depends on winter-based tourism; for instance, Australia, Austria, Scotland, Switzerland, and the United States achieve specific attention to practitioners and researchers to evaluate the anticipated negative results of climate fluctuation (Bürki et al., 2007; Scott, 2003). Climate change and resulting environmental adversities have already directly and indirectly threatened and negatively influenced more than 60 percent of tourism-related businesses in Torbay, England (Jenkins & Nicholls, 2010). Australia's tourism, like many other tourist spots in Asia pacific region, is at risk, and its natural appeals are deteriorated due to the harmful effects and consequences of climate change (Ruhanen & Shakeela, 2013). In Poland, frequent weather changes, seasonal instability, and multiannual fluctuation have a significant influence on tourist movement where inconvenient weather conditions negatively impact tourists' flow (Blazejczyk et al., 2014) and the Asian region suffers from the same vulnerable conditions (Nasiry & Nakhooda, 2016). More precisely, tourism has turned out to be the most affected and vulnerable industry due to climate change (Dogru et al., 2019). Therefore, since the tourism industry observes the worst consequence of climate change, this situation demands strengthening and fostering structural changes in this global industry, focusing on mitigation and adaptation strategies (Bürki et al., 2007).

Adverse Impacts of Climate Change on Tourism: Bangladesh Perspective

Severe harmful effects on the natural settings and biological systems are unexpectedly experienced due to climatic variance, which endangers our ecological and environmental balance and puts the survival of wildlife as well as natural settings at risk (Dube & Nhamo, 2020). However, the tourism sector's susceptibility to climate change has been taken very lightly and described shortsightedly in developing countries (Simpson, 2007), for example, in Bangladesh. Climate change perhaps disrupts and degrades the natural environment, lowers the quality of tourism products, and negatively influences the local community and economy (Scott, 2003). In developing countries, the probable shock of climate fluctuations faced by the tourism sector will not only be confined to swing the visitors' travels intention, seasonality of tours, unstable infrastructural facilities, maritime downgrading, and beach spoiling tasks but also expanded to severe ecological imbalance, biodiversity destruction, vulnerability increase, the income source and livelihood aids undermining (Simpson, 2007). Because the tourism and hospitality industry is prone and sensitive to climate variability, and directly linked with other industries, segments, and sectors like production, farming and cultivation, construction, energy, and water in developing states (Sinclair-Maragh, 2016), particularly in Bangladesh. Compared to rich nations, developing countries' economies experience the worst consequences

and suffer from significant losses due to rapid climate disruption, just as there exists discrimination between them in greenhouse gas emissions (Levy et al., 2017). Important tourism destinations in Bangladesh including coastal and wetlands landscapes, islands, beaches, hilly areas and natural or reserved forests are suffering from heavy and irregular rainfall, sturdy wind, storminess, heavy long fog, drought and hot spells, lengthy hot summer, unpredictable coastal flooding and erosion, mounting sea levels, and increased exposure to natural disasters (Ministry of Environment and Forests, n.d.). Hence, further growth in reducing climatic troubles on tourism is highly expected through utilizing the merits of this sector and influencing the economic and political conditions of developing nations, although the tourists do not feel willing to change their attitude and behavior to lessen the climate change effect (Dillimono & Dickinson, 2015). In fine, climate change is a factual matter which has begun to influence the tourism sector of developing economies; if not appropriately addressed, the fast-growing travel and hospitality industry will be adversely affected (Sinclair-Maragh, 2016).

However, the impacts of climate change on various tourists' destinations in Bangladesh are summarized in below Table 17.1.

Mitigation and Adaptation Strategies to Tackle Climate Change Effect on Sustainable Tourism

Adequate research on the association between climate change and tourism has been scientifically and rigorously approached, but the exact implementation of findings at the policy level has been impeded and stuck (Ma & Kirilenko, 2020). As a result, mitigation and adaptation concerning the climate variance impact on tourism have emerged successful to a limited extent. However, from a Bangladesh perspective, adaptation rather than mitigation should be focused in addressing climate change effect (Ministry of Environment and Forests, 2009). In this framework, tourism products and services that emit less Green House Gas (GHG) are supposed to play an imperative and leading role in the economy and the environment (Kitamura et al., 2020). Hence, it is a timely expectation to design and promote such tourism products and services that are tolerant and conducive to nature and the environment, and the travelers should behave responsibly in choosing environment-friendly products and services while visiting (Kitamura et al., 2020). Furthermore, tourism's societal and cultural needs are to be changed with regards to climate variation and temperature increase issue (Burns & Bibbings, 2009). Following this, green tourism products and infrastructure, environmentally responsible regulation, cultural conservation, and use of eco-friendly technology like solar panels and bulbs with comprehensive operational framework-based policies can be approached to guarantee sustainability in tourism (Ministry of Environment and Forests, n.d.; Pan et al., 2018). Since the mid-90s, the tourism industry has revolved around the notion of sustainability, and the global tourism industry is seriously embellished with the

Table 17.1 Climate Change Risks and Impacts on Major Tourist Spots in Bangladesh (source: Ministry of Environment and Forests, n.d.)

Places	Risks	Direct impacts	Indirect impacts
Cox's bazar and Teknaf peninsula	Increased magnitude of costal natural disasters Long and short-term coastal inundation Loss of shorelines, land and increased salinity for SLR	Causality & high mortality Visit restriction Loss of tourism Infrastructures Damage to roads, Coastlines Minimization of development activities High degree of safety and efficiency requirement	Loss of summer tourism Reduced local employments High investment requirement Shift of tourist destination/facilities
The Sundarbans	Increased frequency of cyclones, storms Loss of mangrove species Coastal squeeze for increased salinity Increasing natural coping period	Causality & high mortality of species Lack of tourism facilities for expensive regular rehabilitation costs Increased travel costs inside the Sundarbans Loss of flagship species with loss of the most attractive tourism subject	Loss of government revenues No alternative to this destination
North-east wetlands, haors and birdwatching spots	Increased flash floods Untimely and high volume of sediment loads and silt deposits changing drainage condition of waterbodies/flows Shift to terrestrial areas from wetlands	Loss of habitats for wetland species, fisheries Change in species Composition, mainly aquatic	Most vulnerable are local livelihoods of poor wetland communities Competing interests for development between local population and tourist facility providers Loss of net benefits in co-managed wetlands
Mixed evergreen forests and hills in CHT, Sylhet and north-eastern hills	Increased mudslides, flash floods, sedimentation for non-navigable areas Reduced or extinction of biodiversity Change in landscape droughts in north western hills, Madhupur	Causality & high mortality of species Loss of international & domestic visitors Migration of people and species Loss of indigenous cultures	Loss of conservation potentials Lack of investments Social unrests & change in social security of climate migrants and indigenous communities Shift of tourist Destination/facilities

<div align="right">(continued)</div>

Table 17.1 (continued)

Places	Risks	Direct impacts	Indirect impacts
Archeological sites	Physical damage & disappearance of vulnerable structures from floods, erosion from high winds	Loss of tourists Loss of local income Accelerated deterioration of ancient sites High degree of safety and efficiency requirement	Less importance on highly damaged sites for renovation No alternative to this destination
Cities, towns and ports	Flooding and water-logging and storms	Causality & high mortality Physical damage affecting all aspects of mobility and services High degree of safety and efficiency requirement	Losses reflecting on national income Restructuring and costly rehabilitation requirement
Islands and chars	Increasing disasters in short-term SLR threatening existence of islands Sandy chars affected by drought	Causality & high mortality Land, habitat to livelihood distress High degree of safety and efficiency requirement	Poorer coastal communities Social unrest relating to floating population in tourist spots High investments to infrastructures Shift of tourist destination/facilities

sustainable tourism to tackle the impact of climate disruption (Weaver, 2011). For confirming sustainability in the development offered by tourism, the activities and events of the industry must be arrayed to secure an ecologically balanced environment (Girard & Nijkamp, 2009).

Again, the application of ICT for tourism development, especially destination management, can be a viable method of implanting sustainability in the tourism industry (Ali & Frew, 2010). Usually, the obstacles and challenges to sustainable tourism are the use of too much energy, wastage of water and deliberate destruction (Pan et al., 2018); which can be successfully minimized through the application of technology that emits low carbon, les GHG, use less water, conserve energy, and produce degradable wastage (Ministry of Environment and Forests, n.d.; Roy & Sims, 2020). Initiatives such as use of primitive technology in the form of coastal embankment can stop tidal flooding and spread of saline water to tourism based coastal areas; installation of early warning technology for floods and cyclones; floating gardening over the hyacinth rafts; floating markets over the boat; installation of solar panel based energy generation and irrigation projects etc. can not only help nullify the effect of climate change, but also attract more tourists to such project area (Ministry of Environment and Forests, 2009; Pasotti, 2019; The Daily Star, 2016). However, for developing sustainable tourism, several programs and goals

need to be set, which should be stated in designing the national plans, policies, and strategies by engaging the local community (Dabour, 2003). Correspondingly, inadequate awareness is causing the extinction of archeological heritage, depletion of natural resources and energy, and destruction of wild life (Mondal, 2018). Thus, mass awareness programs, environmental education, financial incentives for environmentally friendly destinations, diversifying eco-tourism products and services, and ecologically responsible legislation can reduce environmental burden and promote sustainability (Dabour, 2003). Furthermore, this industry fails to attract business and environmental professionals' concentration, resulting in a lack of satisfactory investment for destination conservation and management (Mondal, 2018). In Bangladesh, comparatively tepid winter and extreme summer heat may upshot health numerous hazards (e.g. dehydration, heat strokes) to tourists entailing more frequent and pricey closures of out-of-doors activities. By meeting the increased tourists demand, as more recreation, theme, or eco parks are being developed in isolated areas, there is an obvious need for improved climatic information and more local weather forecasting primarily designed to warn the tourists of these dangers (Ministry of Environment and Forests, n.d.). Hence, use of technology to address such issues becomes mandatory. So, investment pertaining to eco-friendly tech-based green initiatives needs to be increased. Alongside, initiatives and responses from entrepreneurs in the form of indigenous technology and knowledge use can perhaps reduce tourists' energy consumption and limit resource usage to mitigate the aspects of extreme weather and severe temperature, as indigenes are believed to have strong understanding of the local and regional weather and associated climate tackling strategies (Jenkins & Nicholls, 2010; Ministry of Environment and Forests, n.d.; Rahman & Alam, 2016).

Moreover, tourism enterprises are to be inspired by self-initiative to form proactive and adaptive approaches to be prepared for tackling climate change impact, yet some tourism destinations are less likely to be proactive (Chin et al., 2019). Given the priority to the local reality dimension, the government, along with the organizations relevant to destination marketing, can assist in motivating and persuading the organizations working with tourism relied enterprises to create a high level of resilience to climate change (Chin et al., 2019). Therefore, immediate support from the government to combat climate fluctuation impact is desirable to alter "business as usual" approach and practices, initiate regulatory actions, and focus on green marketing practices, emphasize sustainability in development and confirm the successful implementation of policies (Jenkins & Nicholls, 2010).

Conclusion

Bangladesh is an emerging country with US$421.4 billion tourism and hospitality economy (Mowla, 2019). Acknowledging the view, Bangladesh is wrapped with natural beauty, encompassed with rivers, archeological heritage and religious destinations, mountains, forest, waterfalls, and beach, which attract domestic and

international tourists' attention and contribute significantly to overall economic development (Pramanik & Rakib, 2020a, 2020b; Rakib & Hassan, 2020a, 2020b; Roy&Roy, 2015). However, like any other economic sector, tourism is triggering irreparable damage to society, environment, and culture (Ali & Frew, 2010). On the other hand, the degradation and damage to ecology and environment are causing climate change, which is again posing serious threats and risks to the tourism industry, especially in the coastal region of Bangladesh. Looking at other part, climate change creates opportunities as well for the tourism industry in the short-range through triggering off-season tourists. Generally, knowledge about climate change in developing countries like Bangladesh is still vague, even creating confusion in its conceptualization (Dillimono & Dickinson, 2015). With reference to tourism, climate change is arguably a long-term issue that emphasizes the standing of acquiring knowledge and understanding about future climate conditions and its predicted impact (Weaver, 2011). In order to respond to climate change hazards and danger, destinations' management needs to prioritize sustainability issues concerning environmental protection and preservation of tourist spots since, in selecting the destinations to travel, visitors now carefully focus on evaluating the destinations' environmental quality (Yaw Jr., 2005). Allied, sustainability reflects the enhancement of economic growth and the reduction of environmental destruction (Yıldırım & Yıldırım, 2020). Thus, developing sustainable tourism can have encouraging results in protecting the environment and alleviating poverty in Bangladesh if the government and concerned actors promptly take appropriate steps (Anwar, 2012). Additionally, information technology has changed the way of thinking about tourism growth by ensuring economic sustainability and reducing ecological difficulties (Ali & Frew, 2014). Continuing the economic development and guarding the natural environment simultaneously is a complex and challenging phenomenon, and the threats and risks that the tourism industry faces as a result of climate change have undoubtedly exacerbated these existing problems (Ali & Frew, 2010). Thus, stakeholders in the tourism industry need to be fully alert to determine the causes and consequences of climate change so that the sources of consequences and causes can possibly be identified, and appropriate measures can perhaps be initiated to nullify the possible negative impacts (Sinclair-Maragh, 2016).

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Chapter 18
Tackling Climate Change Effects and Sustainable Tourism Products and Services Development Through Innovation in Bangladesh

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Abstract Worldwide Climate change is a challenging issue for every sector from business to agriculture or society. Tourism is not exempt from the adversity of Climate Change impact in a disaster-prone country like Bangladesh. Tourism could be regarded as a worst victim to Climate Change and it contributes to global Climate Change as well. However, the chapter outlays the Climate Change impact on tourism in Bangladesh and potential tackling strategies for sustainable tourism development of the country. A thorough systematic review has been done based on peer reviewed journals, reports of tourism policy makers or civil society dialogues to outline potential adaptation strategies that could be implanted by the tourism industries or stakeholders of Bangladesh to make it more sustainable. Though tourism industry of Bangladesh is still lagging behind than the neighboring countries, it is high time to adopt the strategies generated from both primary and secondary sources of data. To observe Climate Change impact thermal images had been analyzed of top tourist destination of Bangladesh and temperature data had been investigated for analysis based on the climatic data collected from the Bangladesh Meteorological Department. Other resources also show same evidence that climate change is bringing about temperature rise, beach erosion, uneven precipitation rate and salinity

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intrusion in the country. Finally, after identifying probable impacts on tourism because of Climate Change, adaptation measures have been suggested widely. Thus, there is always scope for further research to develop tourism sector is a sustainable manner and combat with the Climate Change adversity.

Keywords Climate change · Sustainable tourism · Innovation · Bangladesh

Introduction

Global warming and Climate Change (CC) is very startling issue worldwide as the Intergovernmental Panel on Climate Change (IPCC) forecasts average temperature is considered to rise 1–3.5 over the next 100 years (Intergovernmental Panel on Climate Change, 2015). The changing ratio of climate varies region to region; it seems little but drastically effects several time by different disasters (McGuigan et al., 2002). Global warming resulting from the Greenhouse Gas (GHG) emission, lead to various hazard and disasters particularly sea level rise (Intergovernmental Panel on Climate Change, 2015). Sea level rise and other disasters are influential in coastal area especially salinity intrusion, flooding, land erosion, loss of fertility, loss of wetland and mangrove due to climate change impact and marine ecosystem (Intergovernmental Panel on Climate Change, 2015). Sea level may cause the disaster for coastal area in small island and countries especially Bangladesh and Egypt has low laying land leads to flood and the consequences loss of cropping land and infrastructures; for example, 46 million people will lose their settlement of the mentioned countries (Intergovernmental Panel on Climate Change, 2015; Department for International Development, 2000). The temperature is increasing in Asia causing sea level rise, floods, droughts, forest fires, and tropical cyclone as well as food security and daily livelihood are challenging (Ministry of Environment and Forests, 2012; Gough & Killwald, 2011).

The tourism industry contributor to a major part for GHGs emission and again is a worst victim of CC. Surely weather-dependent tourism industry is affected by CC (Sharon et al., 2013). Tourism is responsible for global climate change from 14% to 17%, however, tourists are restrained from contributing for lesser carbon footprint to a greater extent (McKercher et al., 2010). CC is impacts on tourism products and services of Bangladesh like most of the countries of the world, and sustainable development need to be done in every sectors of the country for livelihood, environment and society.

Emergence, Development and Controversies of the Concept Climate Change

Climate Change was first introduced in 1896, the chemist Svante Arrhenius, projected that carbon dioxide is emitted by anthropogenic agents thereby temperature is increasing gradually. However, it got scientific momentum with the emergence of environmentalism during 1960 to 1970. The global warming got importance in the 1980s resulting the founding of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations in 1988. Until now, IPCC has published five-assessment report on climate change 1990, 1995, 2001, 2007 and 2013–14. At present 195 countries are the members of the organizations to go forward future (Intergovernmental Panel on Climate Change, 2020). The reports of IPCC are scientific not controversial, and 97% peer- reviewed articles are recommended global warming initiating by human although very few number of argue climate is not changing. Table 18.1 shows direct impact of CC in the global environment.

In contrast, a group of scientist working for the Non-Governmental International Panel on Climate change (NIPCC) provides evidences that climate change is a natural process and the earth is not going to have devastating effect because of climate change (Non-governmental International Panel on Climate change, 2014). Instead, NIPCC proves from different sectors that climate change is going to bring good luck to the biological to the physical sphere of the earth. Scientists argue that climate change due to anthropogenic factor is one of the many predictions for future. There is no validity of the issue. As it is not proved until now, it has skeptical opinions, whereas climate change due to the natural causes could be proved from prior evidences. So, there is no importance to trust or rely only one unproved hypothesis. According to the scientist the temperature of earth is going to be cooled in near future because of solar cycles. So, it could be said that the temperature is going to

Table 18.1 Recent trends and projections (direct impact of CC) for extreme weather events

Impact on water	Impact on air	Impact on land	Impact on biome
Increase trend of oceanic temperature	Changing pattern in precipitation	Decreasing trend of forests in the tropical and equatorial region	Decreasing trend of food production
Deceasing trend of sea ice	Trend of temperature rise		Degradation of wildlife
Rising trend of sea level	Warmer and fewer cold days and nights over	Risk in small islands	Decreasing diversity of marine ecosystem
Coastal inundation and habitat loss	Intense tropical cyclone	Spreading of zoonotic diseases	Distributional shift and reduced fisheries catch potential at low latitudes
Increased damages from river and coastal urban floods	Heavy precipitation events.	Increased drought related water and food shortage	Coral bleaching

Source: Intergovernmental Panel on Climate Change 2015

be cooled instead of warming in future. In the last three to four decades, the intensity and frequency of disasters particularly flood, cyclone, tornado, drought are increasing along with regular system of environment is shifting especially season by reason of global warming (Ministry of Environment and Forests, 2012). The landform of Bangladesh is different based on regional variation, 80% land area is plain deltaic and only 18% is hilly area (Ahmed, 2015; Alam et al., 2005).

Impact of Climate Change on Tourism

Warmer marine environment effects drastically on natural environment, especially coastal ecosystem and natural beauty restraining the growth of coral, marine flora and fauna, and demolish the protection of beauty hindering tourism (Intergovernmental Panel on Climate Change, 2001; Organisation for Economic Co-operation and Development, 2000). Climate change effect on coastal environment by flooding, tidal surge, salinity intrusion portraying negative image of a destination to the world (Kumar et al., 2018). Developing countries are potential to affect climate change due to lack of copping capacity particularly disaster warning system, disaster response and recovery (Global Environment Facility, 2001). Different disastrous situation many people affected especially natural resources, agricultural land, and infrastructure. Sea level rise cause of submerges or eroding small islands, most of which are popular tourism destinations. Some places loss the hospitable environment on earth surface by extreme temperature (Kumar et al., 2018). Nonetheless, emergence of various zoonotic diseases by the changed pattern of ecosystem threatens lives on earth. Increased rate of precipitation in several destinations might impact extremely on the climate dependent tourism. Too much hot weather is not favorable for the tourist even in the beach areas.

Climate Change Impact on Tourism Products and Services of Bangladesh

Bangladesh is one of the worst affected countries of CC among in the whole world because of high density of population in a small deltaic country (Kumar et al., 2018). CC impact is visible and forecasted in the coastal areas mostly by salinity intrusion, sea-level rise, erosion of beach areas, and degradation of mangrove biodiversity and wetland inundation. There are several product and services involved in tourism industry such as recreation, heritage, wildlife, aesthetics, food and beverages, accommodation and so on. On the other hand, beach tourism covers the top market segment of tourism industry in the developing and least developed countries (World Tourism Organization and United Nations Environment Program, 2008). CC represents a considerable and growing threat to the resilience of coastal forest

biodiversity and community viability, particularly in the context of developing countries (Intergovernmental Panel on Climate Change, 2015). CC and tourism research has been neglected in the global south (especially in the developing countries) though the tourism industries are emerging more than any other industries. Research and availability of data is abundant in the northern world specifically in the north Americas (Hoogendoorn & Fitchett, 2018). The coastal zone in particular is extremely prone to flooding, as well as salinity intrusion, storm surges, and rapid geomorphological changes (Brammer, 2014). Figure 18.1 shows the trend of temperature of last forty years in Bangladesh.

The temperature of the country is rising though there exists fluctuations in different seasons. However, there is a slower trend of increase of temperature and in the last forty years it increased to 1.5–2 (°C). On the other hand, Fig. 18.2 shows that the changed pattern of temperature of the micro-climatic region at Cox's Bazar Sadar Upazila.

From the images (Fig. 18.2) it is visible there is an increasing trend of temperature rise in the top tourism destination (i.e. Cox's Bazar Sadar Upazila) of Bangladesh. Though the thermal were considered only for the winter season, it is predictable to be similar for other seasons. It shows that temperature is rising in that microclimatic region by 0.5–1 °C per 40 years. And most interestingly temperature of the beach areas along with offshore is rising. Because of rising trend of temperature of the beach, weather might not be soothing for the tourists for this beautiful longest continuous seas beach in the world. Study shows that there is strong correlation between rise of temperature and unwillingness to visit the destination (Amelung et al., 2007). Besides, selected global climate models predicted that climate change would have a negative impact on land value depending on the climate model and source of farm income (Hossain et al., 2020).

Again, there is a high tendency of erosion of shoreline in the southern part of the country. Though accretion is occurring because of the geological structure of the region, variation exists in the coastal accretion and erosion status. The coastal landform of the country is depositional in nature; however, erosion rate is higher in the
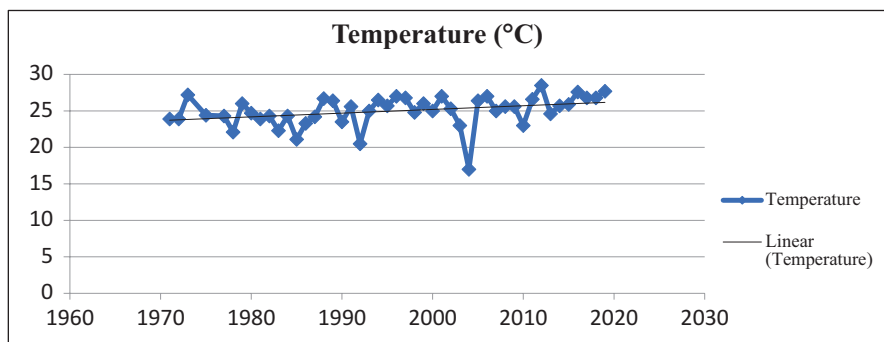
Fig. 18.1 Trend of temperature of Bangladesh (1970–2020). (Source: Climate Division of Bangladesh Meteorological Department 2020)
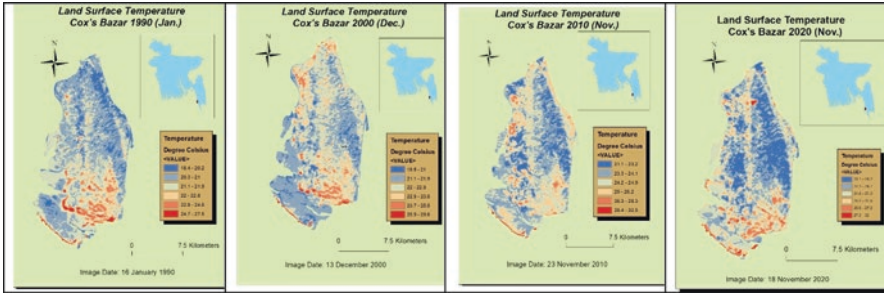
Fig. 18.2 Image of thermal change detection of Cox's Bazar Sadar Upazila from 1990–2020. (Source: Authors generated 2020)

western part. At present the rate of erosion magnitudes of 103.42 km^2 (Sarwar & Woodroffe, 2013). Yet, in the eastern part accretion is slightly higher than erosion or stable in some cases. However, overall erosion rate is higher in the southern part. This condition is exacerbated by the present and predicted future sea-level rise stimulating more coastal erosion and recurring natural disasters such as cyclone, storm surges, subsidence of beach areas (Sarwar & Woodroffe, 2013). Thus, the dynamics of coastal livelihood will be influenced by climate change impacts on tourism. Moreover, it will encompass with more loss of capitals and assets for tourism industries. Furthermore, tourism industries will loss around 17% till 2100 due to the inundation predicted by IPCC and Bangladesh is not exempt from it (Mehvar et al., 2019).

Present Status of Tourism in Bangladesh

Tourism in now a vast and influencing factor controlling global economic development by contributing to 10.3% to the world's GDP, providing with 1 in every 10 jobs and 28.3% of global service exports with 4.3% total capital investments (World Travel & Tourism Council, 2019). On the other hand, there has been a trend of increasing foreign exchange earnings from tourism in Bangladesh (US$0.13 billion, though it is very low compared to other neighboring countries such as Nepal (US$379 million), India (US$18.34 billion) or Maldives (US$1.87 billion) (World Bank, 2008). Tourism industry of Bangladesh is still lagging behind to attract international tourists. Along with international tourists, emerging domestic tourists directly contributes 2.2% of the total GDP, generating only 0.4% of GDP from visitor's export, and creating 1.8% tourism related jobs, is considered as an underdeveloped industry (World Travel & Tourism Council, 2017). While Bangladesh has great potential for tourism expansion, because of various socio-economic and political conditions of the country, tourism is not contributing much to the economy of the country compared to neighboring countries such as India, Nepal, Maldives, or Sri Lanka. Major coastal tourist destinations in Bangladesh are the Sundarbans in Khulna, Patenga

Beach in Chittagong, Cox's Bazar Beach, Kuakata Sea Beach, Sonadia Island, Fatrar Char, only coral beach the Saint Martin Island etc. (Ahmed, 2016; Department of Environment, 2008).

Furthermore, tourism industries of Bangladesh face calamities in tourism destination from the anomalies driven from environment, economy and society (Sirakaya et al., 2001). The coastline in the south of Bangladesh is about 700 km, 35 million people are living there who are most vulnerable for cyclone, tidal surge and salinity intrusion consequences of climate changes (Ministry of Environment and Forests, 2012). Climate change is not only impact on agriculture but also impact on another important sector in Bangladesh is tourism. There is negligence of proper policy implementation for tourism development in the country. With the inconsistent numbers of foreign visitors in Bangladesh, the practice of mass tourism makes the coastal areas more vulnerable. Without measuring the actual carrying capacity and planning tourism facilities these destinations have mass infrastructural development.

Therefore, natural resources are destructed in the fragile coastline of Bangladesh. Spoilt natural environment is less appealing to tourists, and the potential risks from mass tourism can be biodiversity loss, increase of pollution, illegal activities (such as smuggling, prostitution, begging). Tourist along with local people has lack of concern about the environment of coastal area (Zahra, 2012). Uncontrolled and environmentally unconcerned tourists destroy biodiversity by dumping food waste, plastic bottles, and bags in the destination. Moreover, there is poor management practice by the tour operators and tourism enterprises, which makes the area unclean. In addition, tourists sometimes bring shells and corals from the beach, which destroys coastal aesthetics with natural environment (Zahra, 2012). Deforestation, because of mass tourism, is also making coastal livelihoods vulnerable. Furthermore, there have been insufficient services, transport infrastructures, and health facilities in the coastal areas of Bangladesh, which is the most important barrier to tourism. Another challenge in tourism development is the negative image of the country abroad. Though the tourist flow is very poor in Bangladesh compared to the neighboring countries, most of the tourists in Bangladesh travel in coastal and hilly areas in the eastern south.

Strategies for Sustainable Tourism Products and Services of Bangladesh

It is found that sustainable tourism development is poorly defined in academia or policy papers in many developing countries, with very limited development practices (Carter et al., 2015). The links between tourism, prosperity and sustainability are complex (Buckley, 2012). Bangladesh is one of the most vulnerable countries to climate risks, both from existing and future and very frequent natural disasters. In the long list of potential impacts from climate change, the risks to the agriculture sector stand out as the most important one (Winston et al., 2010). These bring

disasters in different period of time, which repulses tourists from abroad. For example, poor sustainable management of the Sundarbans is observed for tourism, as gain is higher by private investors, no incorporation of local involvement in tourism business, lack of structured policy implementation to ensure sustainable tourism (Hassan et al. 2019).

The approach of identifying national tourism and recreation products and services in financial terms makes decision makers of a nation to prioritize and strengthen adaptation policy (Kubo et al., 2020). On the other hand, resilience is another term widely used for adapting with CC impact and enhancing sustainability in the tourism industry. This concept understands with the links between Anthropo-environmental process and tourism development. Only the myopic view of economic development of host interest might not the only target. Innovation and technology use for the betterment of surrounding society and environment should be considered for better resilience in a destination (Cheung & Li, 2019). Hall (2019) criticizes research and concern assessment lacks in sustainable tourism development by the Sustainable Development Goals (SDG) target. Furthermore, it is very hard to understand whether SDGs along with their tourism objectives really wants to shift from growth mentality the conserve ecosystem by embracing travel limit.

Ironically, sustainable tourism is not only emphasis on environmental damage but also focus on local community and economic and social opportunities. Sustainable tourism manages mainly the environmental, economic and social environment of tourist destination. Sustainable tourism ensures the travelers and local people opportunities, quality of destination and development. Mostly important to conserve the tourist destination and provide the facilities of tourists and local people (World Tourism Organization, 2007). It gives guidelines of three aspects of tourism from conservation of destination's natural setting to recreation spectrum or livelihood of the locals. Thus, strengthens the capacity of the locals. Regulatory instruments can provide foundation to the tourism industry in nonetheless developed or developing countries (Buckley, 2012). Though implementation for regulatory instruments might face severe challenges in developing countries. This is applicable for Bangladesh also. Moreover, in the tourism industries there is no structured and effective structured advocacy instrument implanted such as membership in Green Globe 21 program or National Standard for Ecotourism Development or Code of Conduct for Eco-tour Operators.

Climate Change Adaptation and Sustainable Tourism Development Through Innovation in Bangladesh

From 2014 several adaptation strategies emerged to combat with CC such as agritourism or Regional Tourism Sustainable Adaptation Framework (RTSAF). However, it is still in infancy stage, needs to be well implemented and evaluated (Njoroge, 2015). According to United Nations Environment Programme (UNEP)

(2003), sustainable tourism needs some basic element of ecotourism to follow, such as (a) Contributing to conservation of biodiversity, (b) Ensure well-being of local people, (c) Embraces interpretation centers, (d) Involve responsible actions from tourism supply chain and tourists, (e) Require the lowest possible use of non-renewable resources, (f) Stress more on local participation, ownership and business opportunities particularly of rural people (Dabour, 2003). Choi and Sirakaya (2005) suggested, sustainable tourism provides the alternative opportunities of host community and ensure the quality of facilities of visitors. The objectives of national tourism policy of Bangladesh in 2010 are to maintain, protect and preserve the resources that confirm the poverty reduction by ensuring employment and facilities (Fig. 18.3).

Conclusion with Climate Change Adaptation Direction by the Tourism Industry of Bangladesh

Coastal and marine tourism of Bangladesh is so popular home and abroad because of soothing environment and natural beauty of the coast. In the context of Bangladesh tourism strategy, the coastal tourism needs burgeon sector smart, innovative, sustainable and inclusive economic development for the country (Sarker et al., 2018). Not only for coastal tourism innovation is needed for every traditional types of tourism development for sustainable tourism development. Here innovation in tourism industry means creating new type of tourism products and services for the industry (Peters & Pikkemaat, 2005). Following are some innovative strategies could be adopted by the tourism industry to adapt with CC in Bangladesh.

Limits of Carrying Capacity

For every destination carrying capacity needs to be addressed. Here two types of carrying capacity should be identified for specific destination such as (1) fixed carrying capacity, and (2) flexible carrying capacity. Again carrying capacity needs to be determined in every sectors such as (1) physical, (2) economic, (3) psychological, (4) ecological, (5) social and (6) political carrying capacity (Kennell, 2015). After fixing carrying capacity for specific destination limiting tourists through innovation such as imposing permit system, increasing of tax rate for extra tourists, limiting accommodation facility etc. could be embraced.

Climate Change Impact on the Tourism Industry of Bangladesh
Uncomfortable temperature
Sea level rise
Unavailability of fresh water
Erosion of beach and infrastructure
Poor visibility
Unpredictable weather
Contingency or disease spreading organism
Increase of disasters
Shrinkage of seasonal verity
Less beauty
Less ecosystem services
Degradation of biodiversity
Loss of heritage
Climate refugee
More expenditure or investment for CC
Damage to infrastructure
Vulnerable community

Natural Attraction
Sea beach
Hill tracts
Tea garden
Wetlands
Mangrove forest / forests
Islands
Rural settings

Tourism of Bangladesh

Built Attraction
Heritage
Festivals/ cultural practices
Spiritual
Theme parks
River cruise
Museum/ Zoo/ Cinema hall
Restaurant / resorts

Innovative Resilience and Adaptation Strategy
Green investment
Natural resource conservation through permitting/digitalization
Heritage conservation
Training on sustainable tourism development
Screening energy efficient products and services
Intrusion of waste management system
Responsible and efficient tourism supply chain
Encouraging technological investment
Zoning and protecting areas
Research and development of cultural capital
Livelihood generation
Promotion by local community through social media
Urban landscaping
Corporate Social Responsibility
Eco-certification, setting eco-friendly standard
Considering local and tourist satisfaction
Improving and implementing climate resilient tourism policy
Monetary instruments

Sustainable Tourism
Responsible Tourism
Community based tourism
Ecotourism
Rural tourism
Volunteerism
Homestay tourism
Agritourism
Heritage tourism
Green tourism

Fig. 18.3 Conceptual framework developed for tackling CC impact through innovation and technology. (Sources: Authors generated 2020)

Innovation Technology

Sustainable tourism development could be ensured by height setting in the rural areas, urban skyline, urban landscaping (i.e. defining natural contours, efficient drainage pattern, establishing green or blue spaces, conserving or restoring wetlands). Configuration of carbon footprint is needed through innovation technology for example, mobile app, virtual monitoring etc. Public access could be maintained or limited by utilizing smart technology. Signage or utility control could be more international, visible for effective tourism interpretation. Not only that noise regulation in festivals, concert, or theme parks could make tourism more interesting.

Natural Environment Conservation

The protection and reservation of natural environment is necessary for sustainable tourism. Tourism depended on energy, so tourism should focus on green energy and environment friendly energy sources should be generated (Kelly & Williams, 2007). Tourism of Bangladesh is totally nature based, Tourism should have an environment policy to conserve nature and overcome from the climate change. Local community improved their quality of by working opportunities and business, so need to provide the environmental knowledge (Torres, 2003). Zoning and districting and protected area zoning

Social and Cultural Environment Protection

Climate change impact is very extreme for the local people and to some extent to the tourists. So, to conserve heritage and cultural capital sustainable livelihood strategies could be adopted to make communities in tourism destinations to be sustainable. When local communities are rewarded for cultural practice and encouraged to showcase their culture, heritage, social bonding to the tourists their integration and social capital become enriched. There could be trade-off by Transfer Development Rights (TDR) agreement for social bonding and establishment of sustainable tourism to tackle CC adversity.

Livelihood Diversification

Tourism is one of the major factors for poverty alleviation where tourism contributes 1% for poverty reduction (Khan et al., 2020). However, this influential factor needs to be sustainable. Tourism development influenced on economic

development, 1% increases investment in tourism triggers economic growth 0.051%. Although approach of Bangladesh tourism policy 2010 is efficiency or economic generation, but there is very little economic generation for the local. High potential of money leakage exists making tourism unsustainable. Therefore, innovation in tourism industry by the local with the help of the government is highly required.

Local Community Promotion

Most of the tourist destinations of Bangladesh are located in natural settings, and some of them are directly and indirectly connected to agriculture. Local food and agricultural product export opportunities are opened by tourism. Tourism promotion by local people of a destination by using social media could identify prospects and build their capacity of tourism industry. Another technique could be coastal afforestation and wildlife sanctuary establishment by local community could bring their pride back and create livelihood with diversity. Thus, many innovative techniques could be adopted to bring sustainable tourism and adopt with CC.

Tourism Planning and Policy

The alternative opportunities provided by the sustainable tourism of host and local communities. Main target of Bangladesh tourism policy of 2010 is to maintain the resources to reduce the loss, poverty alleviation, creating employment and opportunities, accommodation and infrastructure development. But last one decade the nature of climate is changing, but the policies do not show any specific objectives regarding climate change adaptation or resilience through tourism development. So, gaps need to be identified and established for ensuring sustainable tourism by implementing effective policy instrument.

Green Tourism Development

Local government and tourists can influence green tourism development by investing on green tourism enterprises, green incentives, preference of green product consumption etc. (Peng et al., 2018). Green incentive mechanism could be adopted by the local government and by the local community. More coordination among different stakeholder in tourism industry needs to be collaborated to achieve sustainable tourism goals (Siakwah et al., 2020). Building standard in every supply chain of tourism industry could bring about resilience to the climate change vulnerability. Standards could be in energy efficiency, building material selection, waste disposal system, pollution controlling mechanism etc.

Green Innovation Strategy

Community based tourism meets public interest and governance could bring about sustainable tourism, (1) spatial restructuring, (2) pluralization of destination management (3) re-envisioning of community (Dredge & Jamal, 2013). Setback or minimal distance (social distance) could minimize disaster vulnerability of local community and biodiversity. So, setting minimal distance for each economic activity needs to be classified. On the other hand, engineering methods could be used to create setback situation by building dyke with revised height, barrier, repelling waterways etc. (Islam et al., 2020).

Though climate change issue is very rhetorical in the tourism industry, however, still now there is lack of interest to adopt the concept in tourism businesses. Neither tourists nor business enterprises show enthusiasm for climate change mitigation or adaptation. Sustainable tourism on the other hand portrays carbon-restrained economic status of the earth where question about climate change is given justification (Scott, 2011). Therefore, everyday innovation and technological advancement is creating opportunities to adapt with climate change and mitigate to some extent fulfilling healthy sustainable tourism to all.

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Part VII
Tourist Experiences

Chapter 19
Tourist Experience and Technology Application in Bangladesh

Check for updates

Muhammad Khalilur Rahman and Azizul Hassan

Abstract The application of technology in the tourism and hospitality industry has both direct and indirect influences on tourist experience. Bangladesh accommodates varieties in its tourism and hospitality industry. The application of advanced technologies adds inimitable dimensions where tourists have become more technology-oriented in collecting information about the products and services they tend to use. A good number of research studies is conducted covering tourist experiences from technology application in the tourism and hospitality industry. However, there is still space to contribute to this very particular research area. This review chapter comprehensively focuses on tourist experiences generated from using innovative tourism and hospitality technologies in Bangladesh. This chapter explores that the number of technology relied tourists is on the rise. The tendency to develop tourist-friendly technology-based applications is dominant. This research identifies a sharp challenge in fulfilling the desired level of tourist experience. There is an uneven situation in terms of both availability and the use of innovative tourism and hospitality technologies. Also, there is a sharp gap between the expectation of tourists and the experiences they receive. This study suggests effective strategy formulation and implementation in the Bangladesh tourism and hospitality industry for better tourist experiences from innovative technology application.

Keywords Tourism · Technology · Experience · Development · Bangladesh

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Introduction

Technological advances have changed the way of travel destination of tourists. Technology and travel are the perfect combinations that play a crucial role in travel destinations. These new developments provide an interactive and exciting experience of travelers. According to Google Travel study, approximately 74% of tourists plan their trips on the Internet, while only 13% still use travel agencies to prepare their travel to different destinations (We are marketing, 2019). The continuous advancement of technology innovation brings a new opportunity for the tourism and hospitality industry that lead to the local community and economy of the country. Innovation presents things in a new way. The usage of Information Communication Technology (ICT) application in tourism and hospitality industry in Bangladesh is still in infant stage due to its unskilled workforce, poor economic condition, lack of knowledge on technology in tourism and hospitality industry. Technology application is not fully employed in the tourism and hospitality industry despite having a positive impact on the Gross Domestic Product (GDP) of Bangladesh.

Tourist-friendly technology applications are essential for sharing information, communication and experience. The ICT sector in Bangladesh is developing faster and the government organization has commended for the development of the ICT sector (Khan, 2020). Besides, Bangladesh Computer Council (BCC) is actively working with the Ministry of Science and Information and Communication Technology for promoting all kinds of ICT activities (Dettoni, 2020). It is an opportunity for tourists to the country can share their personal experience with the innovation facilities. Law et al. (2009) reported that tourists expect technological support in their travel activities as it reflects their experience by sharing information with others. The tourism and hospitality industry in Bangladesh should ensure for its use of technology application and adoption of innovation in technologies for instance the social network for involving with customers. The application of technology can easily manage and share the information with minimal cost. Thousands of tourists are playing a crucial role in this paradigm shift and the desire to travel and also preferring to new technology. The application of modern technology has given way to a new context where social media, blogs and apps are playing a significant role for tourists. The hospitality and travel industry has become aware of this trend and adapting its business model and product to attract this coveted target. This study aims to analyze the strategy and operational implementation of technological innovation, and the effect of technology application on the tourism and hospitality industry in Bangladesh.

Trends of New Technology in the Tourism and Hospitality Industry

There are many factors which can mitigate the travel and hospitality issues but the new technological solutions are the main actors that can play a significant role in improving processes of trips and tourists experience. Modern technology plays a crucial role in the tourism and hospitality industry. Ten years ago, tourists had to buy or print a map, whereas today they can access information through their mobile phones (Kubo et al., 2020) that provide location-based tourist information (Park et al., 2020; Kim et al., 2020). Technology is a crucial factor that changes the world of travel, and tourists have more information, more access and higher expectations for their trips. The travel and hospitality industry in Bangladesh is attempting improvement to processes, communication, customer service, customer relationships, and the creation of a new business model using the new technology (Bangladesh Post, 2019). This development goes beyond the tourist experience, which entails transforming the tourism systems that lead to benefits for the tourists, and enriches the process of travel planning.

Tourist Experience of Hospitality Technologies and Innovative Tourism

Tourists' experiences are multidimensional as different types of services are associated with the tourist journey during, before and after the trip (Stickdorn & Zehrer, 2009). To conceptualize the technology-based tourists' experience, it is important to understand the role of ICT that play in all stages of the tourist experience. The travel and tourism industry in Bangladesh is using technology-based devices for communicating among the operators, suppliers, customers, service providers, supply chain managers, guests, partners and distribution channels. Mowla (2019) reported that to enhance the technology application in Bangladesh, some crucial factors are essential to be considered such as technological literacy, technical and human infrastructure, the Internet service, ICT regulations, training for employees, and communication with other sectors. The mobile technology in Bangladesh has created a link between tourists and hosts (Fatima et al., 2019). Tourists' experience has augmented through the technology application. Majority of the tourist are relied on search engine or online for searching information about the tourist activities including tour packages, air tickets, hotels, restaurant, shopping places and entertainment (Ho et al., 2012). There are couples of apps that are accessible using the Google play store. Tourists can simply download and install them in their mobile and searching their queries. Tourists mostly rely on Google Map, Google Earth, Google, YouTube, websites, and hotel booking sites (Pejic et al., 2009; Sheppard & Cizek, 2009; Mathayomchan & Sripanidkulchai, 2019). The software can enable to have all information including self-organizing, collaborative the IoT resource networks (Lewandowski et al.,

2020); thus most of the tourist of Bangladesh uses social media, online travel agencies, Web 2.0 technology, virtual communication, and management information systems.

Tourism and Hospitality Service Innovations

Innovative technologies and business model have reformed the tourism and hospitality industry. For example, mobile booking, mobile banking, mobile self-check-in, smartphone boarding passes, electronic luggage tags, hotel service optimization systems, and voice over the Internet protocol phones that are interconnected with the hotel's ecosystem (Bilgihan & Nejad, 2015). Guests in the hotel can use a smartphone for ordering room service. In some hospitality services, guests can interact with their own mobile devices to decide for dinner or other services. For example, Link@Sheraton is a touchscreen device that creates a new experience by communicating with guests (Bilgihan & Nejad, 2015). This innovation can explore local tourist attraction and enrich their hotel experience. Some innovations such as customer intelligence tools and customer relationship management are used by the hotel managers can improve their guests' experiences using order history and consumption patterns (Weiermair, 2006). People can directly communicate with corresponding departments through wearable devices. Innovations in the tourism and hospitality industry follow a trajectory of service innovation modes (Gremyr et al., 2014; Gomezelj, 2016). This innovation can lead to operational efficiency and create value for customers (Bilgihan & Nejad, 2015; Weiermair, 2006). Thus, service firms have developed the quality of their service and offer a more customized experience.

Technology Usage in the Tourism and Hospitality Industry

The development of innovation is getting adopted by the tourism and hospitality industry. This industry depends on the accessibility of updated information. Accordingly, the development of e-tourism is presently apparent and it is expected that e-tourism has wonderful prospects in the future. We are social (2019) reported that there are 5.11 billion mobile users around the world today, 4.39 billion the The Internet users, 3.48 billion social media users and 3.26 billion people use social media on mobile devices in 2019. The utilisation of Information Technology (IT) allows us to meet the demand of tourists. The weakness of IT network may lead to losing its competitiveness. The technologies usage in tourism and hospitality industry is visible, they are e-tourism, tourism and travel website, the domain name in web, web design, online service management, mobile PCs, online shopping, wireless correspondence and customer-driven innovations. According to Xiang (2018) and Khatri (2019), there are numerous new technologies (e.g. search engines, Wi-Fi,

website, mobile, social media, digital apps, Global Positioning System or GPS, blogs, machine learning, database marketing) that providing easy accessibility of having information in the tourism and hospitality industry. The travel and tourism operators and airline agencies are interconnected with the new innovative technologies. Hospitality and travel industry are using GPS tracking to find their potential customers and offered them discounts, tourism packages, and hotel accommodation facilities (Beeco et al., 2013; Wolf et al., 2013). The property management systems are used by the hotel managers to record the daily activities and the record the information of guest in the hotel. The application of Web 2.0 is used for the relationship between service providers and the customers (Sharma & Baoku, 2013; Sigala, 2009). Buhalis et al. (2019) point out that blockchain, virtual assistant, 5G and IoT are providing possible solutions to tourism and hospitality industry with access to tourism experience and travel behavior.

Use of Search Engine Optimisation in the Tourism and Hospitality Industry

A search engine is a tool used to find and retrieve data from the World Wide Web (Al-Masri & Mahmoud, 2008; Noy et al., 2019). Search engine optimization is a tool utilized by website designers for making web indexes. It is a fundamental part of digital marketing (Atshaya & Rungta, 2016) because people often search for commercial or other purposes to find information about the products and services. Some search engines use algorithms, mine data and human contribution to recognize websites. Thus, a lot of data online do not always present users with essential information. The search engine identifies the types of data that is more useful for users. For instance, the tourism and hospitality industry may optimize their website with significant keywords, link with different destinations and other significant categories to be recognized by a search engine (Vyas, 2019; Stylos & Zwiegelaar, 2019) such as yahoo or Google search. When somebody is using Google and searching for hotels in its desired location, a web search will match more accordingly with hotels in their favored destinations. Search engine optimization can prompt more prominent deals and leads, long haul development in tourists to the website and less marketing exertion required. Stylos and Zwiegelaar (2019) stated that big data-driven marketing practices such as search engine marketing, marketing mix optimization and CRM play a crucial role in creating new forms of data. The value of big data in the tourism and hospitality industry has been widely recognized, as the use of big data enrich industry's decision support systems to reach process optimization.

Tourism and Hospitality Distribution Channel

The advancement of the Internet innovations with their universal accessibility has changed consumers' behavior and attitudes to the traditional model of tourism and hospitality services (Buhalis & Law, 2008). The travel and tourism products and services have been changed due to the Internet in particular and other information and communication technology (ICT) (Buhalis & O'Connor, 2005; Xiang et al., 2015). ICT has been dynamically adopted in the business with traditional models consolidating the Central Reservation Systems (CSR) in the mid-1970s, followed by advancement of the Global Distribution System during the 1980s and motivating us to the World Wide Web (Khan & Hossain, 2018). Indeed, even in the pre-Internet model reservations were conveyed electronically to deals workplaces and accomplice organizations permitting travel agents to affirm reservations and lead transaction flexibly. The hospitality and travel agents can develop products and gain competitive advantages as they can provide tourists with real-time data for more choice and opportunities. Buhalis and Laws (2008) identified the transformation in the distribution channels with the initiation of the Internet. Aldebert et al. (2011) mentioned that the modern technologies in the tourism and hospitality industry are contributing a vital role in intermediaries and third parties selling of tourist products and services (e.g. car hire).

Social Media and The Internet Marketing in Tourism and Hospitality Services

Social media plays a crucial role in the tourism and hospitality industry, and the connection between stakeholders in the business. Social media is an online platform and innovation utilized by individuals to share their experiences and opinions (Alalwan et al., 2017; Ahmed et al., 2019). Social media can likewise incorporate photographs, recordings, music and opinion communicated by contributors. This implies that consumers may promote certain destinations or hotels when they have had an experience. Social media is an incredible democratic power communicating social feelings and can enable correspondence and collaboration pointedly. Integrating websites, information and communication technology (ICT) systems with the social network can prompt tourism and hospitality development and future business potential (Mihajlović, 2012). The Internet is an example of a networked technology which communicates with other forms of ICT. Destination Management Organizations (DMOs) is responsible for developing the tourism and hospitality services for a particular area (Presenza et al., 2005). DMOs may also work with their Destination Management Systems (DMS) for distributing, collecting, and promoting services in a specific territory. Small and medium tourism operators may use their systems to coordinate with local DMS for general marketing, reservations and providing information. The consolidation of modern technologies such as Central

Reservation Systems (CSR) and Global distribution systems (GDSs) are serving the distribution model with tourism and hospitality operators (Brdar & Gajić, 2019). However, they likewise recognized the new e-Mediaries helping online business; this being the mobile device, mCommerce, interactive digital TV and the Internet.

Smart Tourism and Hospitality Technologies

Information and communication technology (ICT) is the crucial factor for the smart tourism and hospitality industry. Smart tourism and hospitality technologies incorporate not only smart devices (Li et al., 2017); it also includes social platforms, the Internet of Things (IoT), cloud computing, Artificial Intelligence (AI), big data, Radio-frequency Identification (FRID), Augmented Reality (AR), Mixed Reality (MR), Virtual Reality (VR), and Near Field Communication (NFC), which are related to tourism and hospitality activities (Pai et al., 2020). The smart tourism and hospitality technology can be divided into two themes such as new technologies and traditional online information channels. Online information can be produced by tourists, and social media is the popular platform for seeking information about tourism and hospitality services. There are four types of sources of tourism and hospitality information such as social media websites, public websites, blogs, and company websites (No & Kim, 2015). Furthermore, No and Kim (2015) stated that accessibility, interaction, security and personalization are the crucial feature of online information, which represent quality, accuracy and credibility of information received from the smart tourism and hospitality technologies at tourism destinations.

Benefits of Smart Devices in the Tourism and Hospitality Industry

With the advancement of information technology, tourism and hospitality industry have incorporated new technologies or experience their benefits. With regards to the travel and hospitality industry, the application of smart devices is becoming extensive, which amplifies the value of travel and hospitality assets and produces enormous financial and social benefits (Neuhofer et al., 2015). Smart devices incorporate wearable and portable devices; smartphones, smartwatches, and smart glasses. The department in the tourism and hospitality industry can tap into smart devices such as self-administration registration boots in hotels, tour guide systems, self-service ticket machines and flight check-in service machines in airports (Pencarelli, 2020). The entire department in the tourism and hospitality industry taps into smart devices such as self-administration registration booths, self-service ticket machines, tour guide systems, and flight check-in service machines in airports. The wearable and

portable devices have become popular to tourists due to the innovation and development of information and communication technology. Smartphones are playing key roles in leisure tourism experience (Kirova & Thanh, 2019). Smartphones combined with the IoT, mobile networks, and near field communication (NFC) technologies have created various tourism-related applications. Hew et al. (2018) opine that smart technologies enable individuals to book hotels, airline tickets, and other products and services on the platform of mobile sites, and easily obtain information about the accommodation and destination transportation.

Technology Solutions for the Tourism and Hospitality Industry

Mobile Technology

The mobile phone has become an individual's tour guide, the best location of hotels and restaurant and map. According to Trip Advisor, around 45% of users use their smartphone for searching for information about their trips (Tripadvisor, 2015). Thus, it is essential to adapt corporate services and communications to these devices. KLM (Royal Air Transportation Company) has created information service for a passenger using Facebook messenger (Tobisová et al., 2017). This system sends the users information about their ticket, boarding pass or update status of flight through Facebook messenger whenever somebody has made a reservation. Along these lines, the user has all the relevant information about their trip in their hand utilizing an app or technology application.

Augmented Reality

AR or VR has also entered into the tourism and hospitality world. Many business companies or industries have used it to show users a cabin on a cruise ship. AR is one of the biggest technology trends of 2017 (Yilmaz, 2018), which is an interactive experience of a real-world environment where the objects are enhanced by computer-generated perceptual information. AR and VR have become gradually popular within the tourism and hospitality industry (Wei, 2019). Nayyar et al. (2018) point out that AR enables hotels and businesses operating to develop the physical environment they are attempting to attract tourists to visit destinations.

The Internet of Things

The Internet of Things (IoT) has promised to bring significant updates to the tourism and hospitality service sector (Li et al., 2017). IoT comprises integrating sensors connected to the Internet inside products (Kiritsis, 2011) such as suitcases, buildings and cars. It is going to be the key transformative factor in the personalization of the customer experience over the next few years. Some hotels offer an app to their customer that provide them interact with the room's regulator or control the TV in the room. We are marketing (2019) points out that a few suitcases have devices to allow users to use their smartphones to follow where their suitcase is whenever to avoid lost stuff or baggage at the airport or other public spots.

Virtual Assistants

The virtual assistant is the open technology that firms or tourism and hospitality industry can employ and adapt to their needs. Some hotels have started to enlist this "help" thanks to the arrival of virtual assistants that are particularly designed for this environment (We are marketing, 2019). The virtual assistant may comprise scheduling appointments, making travel arrangements, managing email account and making phone calls. Virtual assistants make access to travel logistics, bookings a breeze and hotel reservations (Yanishevskaya et al., 2019). The online virtual assistants are changing the way customer services in the tourism and hospitality industry. IBM has launched a new Watson Assistant, a digital assistant version of its Watson artificial intelligence (AI) and natural language conversation systems for connecting enterprises (The Internet of Business, 2020). Al can create an interactive and personalized experience for customers.

Big Data

Big data is considered as beneficial to business in general and tourism and hospitality industry in particular (Line et al., 2020; Mariani et al., 2018). According to Yallop and Seraphin (2020), in the travel and hospitality sector, the effective use of big data is related with revenue management (e.g. with external data such as flight information, school holiday and information about local events, with internal data such as inhabitance rates and current bookings); consumer experience and reputation management (e.g. online reviews, social media conversations, customer survey and service usage data), strategic marketing purposes (e.g. identifying consumer trends to best cater marketing benefits).

Blockchain

Blockchain is innovation and a specific type of database ready to change the world. It is mostly connected with money and it also provides the idea that can affect travel (Filimonau & Naumova, 2020). Bodkhe et al. (2019) stated that blockchain enables smart tourism and hospitality management. According to Nuryyev et al. (2020), while there has not been much experimentation with it, it is conceivable that it will help recognize travelers at the airport, ensure transparency in travelers' feelings, attitudes, and simple and secure payments.

Conclusion

The main crucial thing is to ensure the affirmation of high innovative capacities in all over the nation. Stakeholders of the travel and hospitality industry of Bangladesh should emphasis on the improvement of innovative infrastructure like strong the Internet connection, more benefits and mechanisms for tourists by which they are connected for having share experience, online use and information encouraged by various technological instruments like the IoT, Web 2.0 technology, AR, VR, and ICT. High technological capacities can defend the expulsion of complexities of tourism and hospitality apps so that travelers do not find it tough to use and access to using apps. The adaptability of technology services should be checked like the design of the website can satisfy the desires of the tourists. The modern technology can encourage traveler experience, discoveries, deliver useful online service, secure visitors' information, and bring travel zones under Wi-Fi are required to be ensured by the stakeholders and government. Ensuring all these opportunities in tourist places in Bangladesh will increase the experience of tourists during travel, pre-travel and post-travel technologies. Tourists' experience and technology management are interconnected and they are dependent on technological solutions and tourists' experience. An appropriate policy for innovations in travel technology and ICT training is required to carry out more research on innovations in the tourism and hospitality industry to the way of doable technology services. By this method, it will be possible to meet the technologically advanced experience of Bangladeshi tourists. If the innovation assistance is enabled for tourists, traditional service arrangement strategies will be adjusted to the tourism and hospitality industry, and tourists will get more platforms to share their experiences. From that, all tourism partners need to take steps for discovering potential solutions. Neuburger et al. (2018) recommend the travel industry to acknowledge "phygital" advancement (AR and VR) for increasing a satisfied tourist experience. Bangladesh can perform well by an alteration towards high technology interactive, predominant innovation in tourism and hospitality industry to ensure innovation enabled experience.

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Chapter 20
Technology Based Service Offers and Tourist Experience Generation in the Tourism and Hospitality Industry in Bangladesh

Sadia Afrin Ananya

Abstract The antiquity of civilization is related to technological development which is fulfilling the peoples' demand year after years. It is successful to create a revolutionary impact on various fields including medical, tourism, communication, digital media, artificial intelligence, scientific innovation, new gadgets and what not. Reliance on the technology of tourism and hospitality industry is swelling from the perspective of the whole world. Instead of service providers, technological advancement offers an interactive and thrilling understanding of tourists. It has made it accessible for visitors to have required information through the Internet and to decide what additional step they should take. In Bangladesh, tourists are enclosed by technology as it supports them throughout their whole travel journey. This chapter is a cogent study that is designed to identify the experience of tourists by using technology, either it is positive or undesirable. In addition, it also compacts with the reaction of them to the technology based services offered from the industry with possible suggestions.

Keywords Technology · Tourist experience · Tourism · Hospitality

Introduction

The introduction of digital technology interconnects the whole world which is possible due to the speedy development of Information Communication and Technology (ICT). The continuous growth and development in the tourism and hospitality

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industry are becoming information driven which impacts on community, society, economy. Digitalized smart tourism announces a new term "Phygital" by reducing the gap between digital technology and physical world (Neuburger et al., 2018). It is the expansion of e-tourism which has more admittance to grasp more people with their active participation (Travel Smart, 2020). Qualified service delivery is provided by the hosts through various technical features. Departmental service related job, public relations and marketing based activities are now far easier through Web 2.0 technology, Global Distribution System (GDS), Central Reservation System.

The progress in ICT influenced the travelers and bring changes in their perceptions, values and expectations (Harner & Swarbrooke, 2016; Pizam & Jeong, 1996). With the expansion of traveler market, different fields of the industry including hotels, resorts, airlines, travel agencies, tour operators are using intranet-extranet-interned reinforced tools, other technologically advanced devices (Bojnec & Kribel, 2004). As a result, tourist experience now greatly matters to the industry and for this, it is rudimentary to identify their using patters and the basic requirements for further use. The determination of consumer's experience is a tough job because it requires to understand the decision making process where tourists decide to travel. Mobile technology is very much appreciable to tourists as they are getting augmented experience, share information, do their pre-trip jobs before travel and communicate prominently but with a very cheap cost (Neuhofer et al., 2015). Tourists in Bangladesh can enjoy a suitable and personalized experience with the innovation of the facilities developed by Information Technology (IT). They are moving forward to collaborative travel where the information ecosystem will dominate like automatic transit, intelligent recommendation network, etc. The current strategies include divisive tactics of the digital world that aid tourist activities. Tourists deserve strong digital support as it influences their experience by playing the role of protector as well as enhancer (Law et al., 2009). Tourists of Bangladesh are not out of that. This chapter is all about the technologies which are used by tourists of the country to identify how it changes their travel pattern, what problems they are facing, how it may enhance the experiences more. It will help to identify the barriers to more technological advancement and make decisive approaches.

Use of Technology in the Tourism and Hospitality Industry

The progress of technology is getting adopted by major industries of the world. Businesses are now consuming technology since it is creating competitiveness by cutting costs, increasing efficiency, improving service and product excellence, innovating products to new markets (Nikoloski, 2014). The tourism and hospitality industry is not out of them. This industry completely relies on the availability of regular and updated information. As a result, the expansion of e-tourism is now evident and it can be hoped that it has glorious prospects in the future.

Tourism market is growing with a plethora of technological advances. The main reason behind that is the cheap price of internet. 4388 million people used internet

in 2019 which is 9.1% higher than in 2018 (Datareportal, 2020). Market Research Future (2020) projected that it is going to achieve US\$ 1134.55 billion in 2023 with a compound annual growth rate of 13.16%. Use of Information Technology (IT) enables to meet of the steady demand of the guest and even if it has a weaker IT network, it may lose its competitiveness (Law et al., 2009). Again from the study of Law, Leung and Buhalis (2009), technological application for the tourism and hospitality sector is visible in the cases: Domain name in online; Online purchasing; Tourism and travel website; Wireless infrastructure; Wireless communication; Mobile computers; e-Tourism; Customer-centric technologies; Semantic web technology; Performance analysis; Online marketing and service management; Web design and others.

Mobile, websites, Wi-Fi, digital apps, social media, search engines, 2.0 technology, VOIP, GPS, GDS, new software of property management system, collaborative filtering, database marketing, relationship marketing, machine learning, online advertising, blogs, etc. new groundbreaking discoveries are providing accessibility of having information and doing work easily to the host as well as tourist community (Khatri, 2019; Xiang, 2018; Bentley, 1996). Travel agencies, tourism operators, hotel operators, airlines, destinations are interconnected with ICT in the digital environment. For instance- hotel chains can get updated information of other sister hotels in one system like the number of occupied and vacant rooms, the number of guaranteed and non-guaranteed reserved rooms, etc. Hospitality companies now use GSP tracking to find their frequent visitor and let them informed about a new offer, discounts, packages, etc. Property Management System (PMS) used by hoteliers make it easy to record the daily activities and guest record of every department. The application of Web 2.0 increases the connection between customers and service providers (Law et al., 2014). These authors have also suggested to maintain user security, technical security of hotel's secret information, have a balanced scorecard and analytical hierarchy process for web design. Moreover, Internet of Things (IoT), Blockchain, 5G, Virtual Assistant, Virtual Reality, etc. are providing feasible solutions to tourism which is connected with integrating sensors (Vidal, 2020). Xiang (2018), believed that the tourism and hospitality sector is shifting towards knowledge in certain industry with access to tourism experience and travel behavior.

Communication for sharing and transferring data, information and resources is done by Web 2.0 (Benckendorff et al., 2003). They are maintaining internet value chains that link up with suppliers, customers, internal operations (Nikoloski, 2014). In another study of e-tourism, by Pitoska (2013), it has been proved that for having a profitable satisfied customer relationship and successful e-marketing, touristic enterprises need to very active in technological use. To stay competitive, organizations are now using technological tools for promotion and reaching the target market. They are now flooded with rapid technological changes. Even a few studies suggested that robotics technology can be used in the future which may accomplish the operational job in a far tranquil way. Progress on innovation in the tourism and hospitality field includes biometric air travel, aerial digital imagery, geo-based technology, e-capable visitor information center, etc. (Khatri, 2019; Lyu & Hwang, 2015). Now, service innovation is mostly needed for providing professional guest

service. Aviation sector is now using Global Distribution Systems (GDS) for travel reservations, Frequent Flyer Program (FFP) for rapid travelers, other IT applications (Benckendorff et al., 2003). This prompt technological evolvement reduces human labor and becomes more dependent on technological efficiency.

Application of Technology and Tourist Experience

Tourist experience is the state of emotional feeling about the whole journey of the trip which may turn out satisfactory or dissatisfactory. The intensity of tourist experience is getting higher along with the time. The experience is in the lower stage when it is in the orientation level, then it is rising up more step by step in attachment, visiting, evaluation, storing, reflection and in the peak point named as enrichment stage (Aho, 2001). Previously, tourists used to be motivated and planned their travel by having details from a variety of sources. For example- the word of mouth communication where one friend may suggest another to visit and tell them how to go over there or where to stay, etc., good personal experience, suggestion from relatives and family, learn about the place from a book and others. Then, tourists were relying on travel agents, advisors, advertisement, Simply, it is justified to say that the tourism industry completely relies on the internal and multiple information search for a particular time being (Ho et al., 2012; Chen & Gursoy, 2000). After this period, the headway of Information Community Technology (ICT) has provided a solution to the information search although there is the existence of demand for the previous sources. Travelers now just not only rely on ICT for information search, but they also need the access to technology even if their staying period in the destination and in the departure.

Tourists are now unlimited users of technological devices like laptop, computer, smartphone, tablet, GPS, portable DVD, etc. In a survey by Xiang, Wang, O'Leary and Fesenmaier (2015), it is found that 85.5% travelers are dependent on the Internet for their trip planning and the sites on which they are relying the most include online travel sites, supplier site, destination site, general travel site, social networking site.

There is the existence of creative class of consumers who are rapidly involved with significant technological invention. They are looking for a creative and appealing experience through internet technologies (Gretzel & Jamal, 2009). Life transforming experience with numerous evolving technologies is now a common demand for them. This class of tourists has access to phone camera through which they are taking pictures of the aesthetic nature of the destination, creating videos (Gretzel & Jamal, 2009; Green, 2002). Instead of that, tourists and the whole hospitality and travel industry are interconnected just because of technological advancement. Mobile technology helps tourists to strive for travel updates, and local tourism opportunities with the development of accelerometers, GPS (Dickinson et al., 2015). The deducted costs of roaming, texts, call, free Wi-Fi, 5G network enable travelers to participate more in tourism activities (Dickinson et al., 2016). But they also have added that complete dependency on tourism related technologies create a

disconnection between tourists and destination. In a few cases even, tourists prefer to use travel apps only when it is required otherwise travel experience can be transformed with digital connection (Paris et al., 2015).

Relationship of technology and tourist experience: There is a direct relationship between technology and tourism (Fig. 20.1). Technological advancement enhances tourist's tour that may influence tourist experience before arrival, occupancy in the destination and after departure period.

From the belvedere of Law, Leung and Buhalis (2009), technology experience can be seen from buyers' decision making process. Here, they demonstrated that the usage of technology and internet is more common among young peer groups in the need recognition stage. People do often use the Internet and mobile technologies for having different kind of information by search engines from various sources. In the alternative evaluation stage, tourists generally compare prices, offers, products and other facilities. Among so many alternatives, tourists choose one and go forward with it and to the travel plan in the purchase decision stage. In this case, most of the tourists do rely on international brands and standards. Online transactions, booking, IT applications, e-commerce, etc. have made it feasible for consumers to be active in the purchasing stage fluently. Technology's application is also comprehended in post-purchase stage. For example- travel review sites, blogs, share experiences in social media, tourism websites, etc.

Furthermore, Boniface and Cooper (2009), have experimented about the whole tourism experience and related it with the traveler's perspective, which is observable on Fig. 20.1. These stages are desired to handle favorably because the feedback of the tourists who are involved in these stages may influence future travels (Park & Santos, 2017).

Anticipation stage: The beginning of tourism experience is genuinely started by tourists. Every destination has some unique tourism resources. Tourists generally first want to identify what destinations they are actually demanding to travel and what they want to experience. This procedure creates a mental image of the

Fig. 20.1 Three phases of tourism experience. (Source: Boniface & Cooper, 2009)
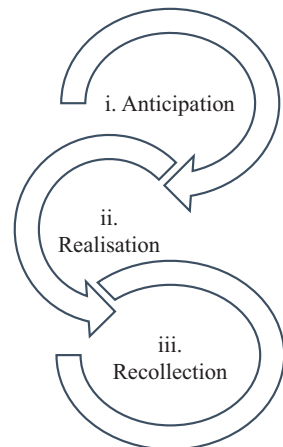
destination in the traveler's mind (Potgieter et al., 2016). On the basis of the perception and beliefs of the tourists, abundant information is composed concerning the tourist place. Tourists find it more exciting to have upgraded technologies in their hands. Smartphones, tablets are easy to carry and inexpensive. They use these devices to find out a destination, its attractions, accommodation, transportation, recreation along with other facilities, compare prices through the Internet. Then they plan about their trip in a comfortable way. Sometimes, they are using travel apps, TripAdvisor, YouTube, flashpackers, travel sites and know about the travel experience review of others. Nowadays, guest reservation systems in hotels are mostly dependent on online where the guests are getting chances to find and reserve their preferable room at the perfect time and at a particular date; know the price, included features, services along with that accommodation because of their access to the website. Even tourists are now use internet to purchase airline ticket and even ticket of other modes of transportation. In this way, they choose a destination to travel along with other facilities and move forward to the second phase.

Realisation stage: In this stage, tourism experience ensues in the destination. Tourists are involved with destination based activities like hiking, snorkelling, gaming, skiing, surfing, kayaking, rafting, bungee jumping, relaxing, enjoying the attractions, etc. During this phase, tourists use free Wi-Fi, tech-savvy conference room, free use of iPhone/gadgets/smartphones, etc. during their stay, automated check-in and check-out facilities by electric kiosks, online payment, digital concierge, smooth appliances, innovative services, digital concierge, hi-tech features, etc. it is the best phase for tourism operators to create an impression in the mind of the visitors and ensure an enthusiastic experience that will influence them to visit the place again.

Recollection stage: This phase can also be called as after tour stage or post travel. Here, tourists share their overall journey with their closest people, share stories in social media or review sites, give review regarding the service and the visited zone. Basically this is the stage where tourist experience gets perfection. Even if in this stage, they are operating technology to splitting their viewpoint and it is influencing others to go for travel.

Tourists of this generation mostly belong to the technology enhanced and technology empowered experience group among four levels of experience hierarchy defined by Neuhofer, Buhalis and Ladkin (2014). They are energetically participating and shape their experience through Web 2.0 technology, the influence of this revolution is visible in all stages of tourism and travel. However, ICT can also work as barriers like usage difficulties, improper infrastructure, etc. and it is very critical to define (Neuhofer et al., 2015). As a result, it may attack tourist's ability to enjoy the full advantages of ICT during their travel.

Tourist Experience of Technology in Tourism and Hospitality Industry: Bangladesh Standpoint

Tourism sector of Bangladesh is expanding and utilizing technology based tools. Traditionally people used to draw travel maps, find brochures, other's preferences, etc. Now, technology enables the new-fangled business environment by ensuring the prolonged communication among operators, service providers, guests, distribution channels, suppliers, partners; developing destination's infrastructure. But for the seamless setting to ensure the application of technology in Bangladesh, there are some factors that are needed to be considered including legal, technical and human infrastructure; ICT culture; internet service; connections with other sectors; ICT regulations; training for all workers (Mowla, 2019). The continuous development of ICT is shifting the hospitality and tourism industry to become competitive and information concentrated.

Several researches have been carried out regarding the tourist experience of technology but there are very few studies are available regarding the perspective of Bangladesh. Basically, tourists of Bangladesh are quite in the development stage of using technologies in comparison with the countries with a major population under the poverty line. The introduction of mobile technology creates a link between tourists and hosts. At the same time, tourist experience is enriched in numerous ways through this. Most of the travelers are now dependent on online for searching exact information about their desirable destinations; price of hotels, motels, airline, bus; discounted service; entertainment sources; shopping places; restaurants; culture; etc. There are so many free and few paid travel apps that are accessible in Google play store. Tourists are now just downloading and installing it in their mobiles and finding out their queries. Moreover, several travelers group are active in social media those are very reliable and reply to the questions of the visitors with great patience. Tourists are dependent on Google, Google Map, Google Earth, digital route map, YouTube, hotel booking sites, websites, portable devices, review group and other online tools.

The consecration of digital technology is mostly used by the young generation. Youths of this country are comfortable to go with the flow of changes. They have nature of exploring the uncovered destinations, going for the rough places and the facts about these places about which normal travelers are not conscious (The Financial Express, 2018). So for that reason, their dependency on digital technology is getting higher and tourist activities are increasing.

Modern tourists of this generation have a mandate for push and personalized information (Neuhofer et al., 2015). Software is needed so that they may work as a digital tourist related information centre. The service providers of Bangladesh prerequisite to be cognisant of the fact to provide updated and upgraded services in this competitive field. Here another fact comes that, details about a destination or tourist zone are not available in one place. All are scattered in different sites, websites, blogs and different other places. Software will enable to have all information in one reliable source. Instead of destination's materials, it may include directions,

customer reviews, other possible places to visit, pertinent suggestions and sources of purchase online tickets. It will save time of tourists and influence them to drive for easy travel. Web 2.0 technology, Destination Management Systems, Management Information Systems, Virtual Communities, Online Travel Agencies, Price Assessment Sites, Context Based Services, AR Applications, Social Medias, Location Based Services are the common example of software, using by most of the tourists of Bangladesh. There are few softwares that is slow to run, have outdated functionalities, poor data. It is causing negative impressions in the mind of the travelers and provokes to create a bad review.

Bangladesh welcomes both domestic and international travelers. For global tourists especially, the availability of technology is one of the first priorities. But not all places of the country are currently capable of maintaining a strong network. Though the price of internet is cheap but due to the absence of resilient network, internet service is often interrupted in few particular precincts. 4G and 5G networks are desirable all over the country. Most of the largest telecommunication operators like GrameenPhone, Banglalink are offering international roaming services for both prepaid and post-paid customers. The charge of this service is quite high and not everyone has the capacity to afford this one. To make sure incessant service, it is crucial to have WLAN, UMTS, Internet, Extranet, Intranet, Wi-Fi, WiMAX access in every hotel, motel, resorts, destination properties. Unfortunately, Bangladesh does not deliver this kind of conveniences in all properties except the upscale, luxury, and few others. The host community needs to remember that tourists may have gone for travel with the purpose of having a break from their regular life, but they also want to maintain uninterrupted communication with friends and family by using digital technologies in the most affordable way. In that case, the development of technological infrastructure is the demand of the time.

Sustainable tourism now has a requirement to go through a process of smart tourism as it has the ability to deepen travel experience. Smart tourism needs a large amount of data which ropes tourism branding, traveler's choice making, guest partaking and augmented reality technology which supports culture based information and involvement by using several apps (Pradhan et al., 2018). Smart Tourism Technology (STT) should be informative, accessible, interactive and personalized since it is linked up to create a value net including functional, social and emotional values (Lee et al., 2018). Bangladesh is in a favorable condition to familiarize smart tourism. Travelers of the country are quite keen enough to enjoy the cost saving travel experience which is more expedient by digital expertise. They have a tendency to rely upon more on online resources rather than the offline materials. They are not relying on the package tour offerings rather they are making their own itineraries with the travel information inspired by technology. But few insecure tourists are in a fear of passing out his/her personal information due to their lack of knowledge regarding the use of smartphones and internet. Additionally, some apps are not user friendly and tourists often find it complex to use it.

Capacity of hardware is also another major issue that influences customer experience. All hardwares are not accomplished for running all travel applications. It can be due to the battery deficits, obsolete technology or unsuitable device. For that

reason, tourists of Bangladesh may face a barrier in terms of having an authentic experience. Hardware like cell phone, navigation system, telephone, kiosks, etc. are very necessary for travelers. In that case, service providers may help them by providing it which will be restricted only for the use of the tourists. They also must make sure that they are perfectly okay to operate and run.

The Model of Enhancing Tourist Experience by Technology

Although there are few barriers that tourists face in terms of getting used to with digital technology, they prefer to use it to make their workings easier. In Bangladesh, problems concerning tourist experience and technology are in the stage which is possible to recover. In Fig. 20.2, it is perceived that during all stages of tourists' travel, technology is used. But here the most important thing is to make sure the confirmation of high technological capacities in all over the country. Stakeholders of tourism and hospitality sector of Bangladesh should focus on the development of technological infrastructure like strong internet connection; more opportunities and
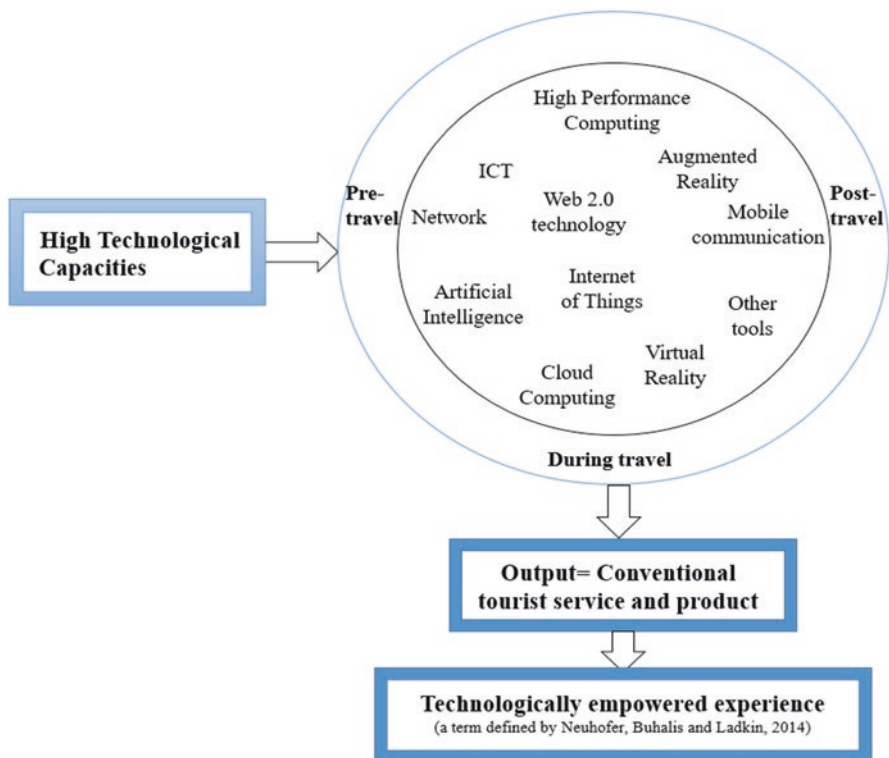

Fig. 20.2 Enhancing tourist experience by technology. (Source: the author, 2020)

mediums for travelers by which they are interconnected for having information, share experience, online use, etc. facilitated by different technological tools like Internet of Things, Augmented Reality, Web 2.0 technology, ICT and others. Another dimension of high technological capacities is to safeguard the removal of complexities of travel and tourism apps so that tourists do not find it difficult to use and to have access to using apps. Besides, the flexibility of tech service needs to be verified like the design of the website or any promotion should be in the way so that it can fulfill the desires of the visitors. For providing a conventional tourist product, policymakers have major roles to play. The innovation of new technology to facilitate tourist experience, research on new discoveries, secure guests' information, bring tourist zones under Wi-Fi, deliver convenient online service are obligatory to be ensured by government, stakeholders, DMO. Confirming all these facilities in tourist places of Bangladesh will enhance the experience of travelers during pre-travel, on site travel and post-travel technologies. Here, the consideration of smart tourism, because superior tourist experience and smart zone management and marketing are interconnected is another important thing (Ivars-Baidal et al., 2019; Femenia-Serra & Ivars-Baidal, 2018). Both are dependent on smart solutions and tourist experience varies on the diversity of the tourist types, needs. Furthermore, ICT training needs to be handled in an increasing rate because this human forces will be integrated to carry out more research on new innovation to the path of feasible tech service. By this approach, it will be conceivable to capture the technologically progressed experience of Bangladeshi tourists. If the technological service is empowered for tourists, traditional service provision techniques will be altered to smart tourism service, tourist will get more platforms to share their positive or negative experience. From that, all stakeholders have to take stepladders for ascertaining possible solutions. Neuburger, Beck and Egger (2018) suggest the world tourism to accept "phygital" development (Augmented Reality and Virtual Reality) for augmenting a satisfied tourist experience. Bangladesh can perform well by a modification towards high tech interactive, prevalent technology to ensure technology empowered experience.

Conclusion

With the blessing of technology, tourism and hospitality industry is budding up and facing major changes. Bangladesh is welcoming these digital technological revolutions to become competitive. In this case, tourist experience is a dependent factor that is contingent mostly on technology. Along with the vast application of technologies in tourism business and service, tourists do also have a need to carry feasible conducts to access it. This chapter is a whole understanding of the situation from the outlook of Bangladeshi tourist experience with their accessibility and problems to technology. By means of this medium, tourists are creating their own experiences but all they need is reasonable conducts to practice it. The operators need to remember that tourist satisfaction leads to the company's profitability as

high standard of experience quality can regulate financial success meaning positive experience. Bangladesh needs a strong policy to run the technological tools in the proper way and it should encourage new innovations in travel technology. With higher technological capacities, it is expected that Bangladesh will perform better to accomplish a pleasing tourist experience.

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Part VIII
Development

Chapter 21
Technology Application in the Tourism Industry for Socio-Economic Development in Bangladesh

Md. H Asibur Rahman and Farjana Nur Saima

Abstract Technology application has become a common phenomenon in the tourism industry throughout the world. In Bangladesh, tourism service providers have started to use various technologies which are comparatively less competitive and not much cutting-edge. Contributions from the use of such technologies are still unexplored in the country context, due to unavailability and incalculable characteristics of necessary data and empirical information regarding their contribution. This chapter, therefore, focuses on explaining the use of innovations and technologies in the tourism industry of Bangladesh and how these revolutionary technologies have an impact on the socio-economic growth of the country. Grounded on the literature studies we have developed a framework that may explain how technology application leads to socio-economic development in any country. In addition, considering the inestimable nature of the data on their relation to social and economic progress, we used the accessible secondary sources to come up with a comprehensive idea of the outcomes of technology implementations in the tourism industry on socio-economic growth in an emerging country like Bangladesh. Finally, based on the findings we discussed implications of the present investigation to the upliftment of the tourism industry for the socio-economic advancement of the country.

Keywords Tourism · Technology application · Socio-economic development · Bangladesh

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Introduction

The tourism industry has come under the spotlight in the last few years because of its promising growth opportunities. Attitude towards this industry is completely changed now. Government and the other concerned authorities are emphasizing the development of this industry. World Tourism Organization (UNWTO) recommends tourism as a mechanism of achieving the objectives of the third-millennium goals (Nooripoor et al., 2020). 80% of the 56 countries (e.g. Kenya, Cambodia, and Honduras) that have implemented poverty alleviation policies have established tourism as an alternative for economic development, jobs creation and poverty alleviation and have considered tourism industry is as important as agriculture and SMEs (Buzinde et al., 2014). Simply, the tourism industry, being an emerging industrial setting, delivers the operating strength for the move of dynamic industries to speed up the way for local, national, and international development (Nooripoor et al., 2020). Tourism is one of the most significant and fast-growing industries in the world that has a huge effect on the expansion of the economies of the nations whose economic advantages involve local community development as well (Osman & Sentosa, 2013). For evidence, UNWTO reported tourism as one of the world's biggest employers since at least one in 10 employments is directly connected to tourism (Cardoso, 2020).

The rise of the tourism industry worldwide has been remarkable in recent years. This big leap is largely due to the rapid increase in accessibility and usage of information technology around the globe (Hassannia et al., 2019). Nowadays, the spiritual pursuits of people have increased, and a massive number of people are opting for going on an excursion. A great change has also been noticed in the taste and pattern of global travelers. Before traveling to anywhere in the world, a tourist checks the status of the destination, its environment, local history, local people's eating patterns, weather etc. (The Financial Express, 2018). The widespread use of the Internet has made it easier for prospective tourists to access large quantities of global data on points of interest, travel plans and destinations (Hassannia et al., 2019).

The rapid development of new technologies has accelerated the growth of the worldwide tourism industry well beyond one's imagination. In recent years, the convergence of network infrastructure strength with the computer technology strength has made tourism-based systems standardized and advanced which in turn has made the business deployment related to tourism simpler and more effective (Mengn et al., 2020). Information and Communication Technology (ICT) and its growth will offer a range of advantages to the tourism industry. Firstly, technologies may be used to attract tourists, where it is easy to publicize and advertise tourist events. Technology may also track tourism activities by helping tourists at their respective destinations before and during their stay. The primary goal of ICT in supplying travelers with a specific tourist destination is to make a fun visit for tourists. To that end, the destination must be reinvented and made appealing and exciting (da Costa Liberato et al., 2018). In the twenty-first century, a remarkable advancement in the tourism industry is unimaginable without the blessings of modern media and technology.

The pandemic of COVID-19 has revealed the critical value of technologies for sustainable tourism to the fore. Tourism planners have a rare opportunity to recognize the role of tourism in promoting the accomplishment of the 2030 Sustainable Development Goals (SDGs) using technology while emerging from this current crisis. UNWTO and United Nations Development Programme (UNDP) have recognized the contribution of technology in creating a prosperous opportunity for tourism (Ali et al., 2020). Undeniably, the tourism industry must be competent to fulfil the needs of customers to arrange travel programs for more accessible travel paths, superior service performance and greater experience, which will result in long-term market growth and success in this industry (Mengn et al., 2020). In addition, sustainable tourism technology provides companies with tools for more efficient knowledge sharing, decision-making and stakeholder involvement to conserve and maintain the environmental, economic, and socio-cultural and heritage ecosystems (Ali & Frew, 2014). At present, a travelers would not pick a destination alone because of the beautiful temples, heavenly sceneries, histories and foods that the destination offers. Other critical issues are present. For example, today's visitors want to be astonished by the destination's novelty; they want the latest knowledge with the assistance of technology about what to do, where to visit, and how to get to a destination (da Costa Liberato et al., 2018) and due to the influence of growing IT in the tourism industry, people interested in the tourism industry have started to concentrate on the advancement of tourism information technology (Mengn et al., 2020).

In Bangladesh, tourism is a growing industry. With the substantial development of the economy in Bangladesh, foreign tourism has increasingly grown, and national tourism is increasing similarly (Roy et al., 2020). But still, the contribution of the tourism industry on GDP is not noteworthy compared to other industries of the economy. The tourism industry has become an information-intensive industry now (Mowla, 2019), where ICT plays a significant role in every stage of the supply chain of tourism commodities and services. For an emerging economy like Bangladesh, information technologies are the key drivers for promoting businesses and commercial activities within and outside the national territory. The government of Bangladesh has set the vision for becoming a digital Bangladesh within 2041, which depicts the aspirations for embracing modern and sophisticated technologies in conducting every activity of the state (The Financial Express, 2019). With a view to achieving the Vision 2041, Bangladesh is steadily merging digitalisation with conventional facilities-providing services in all industries and the tourism industry is indeed not outside of this scope. Though tourism service providers in Bangladesh have started to use various technologies, those are comparatively less competitive and not much cutting-edge. The technology adoption is only limited to web-based services like online checking, review, communication, reservation, and payment before traveling to a particular destination, the Global Positioning System (GPS) to find out the exact location, Wi-Fi facilities during the stay in the hotel. Most of the tourism enterprises use computer and internet technologies for conducting their daily business activities. As several issues such as cost constraint, insufficient technical know-how support, lack of skilled manpower, unwillingness, and incapacity to

use technological equipment, lack of knowledge etc. act as barriers in adopting innovative technological tools in a developing country like Bangladesh. However, this limited technology adoption in this industry has already been proved to be beneficial for the tourists as well as the enterprises so far.

There is still no consensus among academicians on whether technology adoption is fruitful always or not; which technologies are better to be adopted for the growth of tourism; what kind of capacities a country needs to adopt a particular technology; which beneficiaries should be given preferences while checking the feasibility of technology adoption in tourism; which point of view should be taken to analyze the impact of technology and tourism on socio-economic development. Though many researchers have tried to explore the impact of technology adoption in the tourism industry empirically applying qualitative and/or quantitative methodologies, there is a dearth of literature on this topic in the context of Bangladesh. Though several qualitative studies have been carried out, no statistical or econometric analysis is available on the economic and financial contribution of tourism in Bangladesh (Roy et al., 2020). But there are no specific studies to investigate the impact of technology application in the tourism industry on the socio-economic development of Bangladesh. Thus, this study tries to explore the impact of technology adoption in the tourism industry on socio-economic development in Bangladesh. For the study, the related literature studies and secondary data have been collected and reviewed and the available and innovative technologies adopted globally have been identified. This study investigates kinds of technologies Bangladesh has already adopted and what other feasible technological innovations Bangladesh can adapt to its socio-economic development.

Literature Review

Technology application in tourism

Tourism means the business activities of providing travelers with the required information, transportation, accommodation, and other relevant services (Akhy & Roy, 2020). The academic community is beginning to understand the significance of modern communication technology for the promotion of tourism (e.g. Gössling, 2017), but there is still a long way to move to fully recognize the influence of ICT in this industry and their future advancement (Inversini & Rega, 2020). It is known that the competitive tourism environment has been reshaped by new connectivity technology. They should vigorously foster community-based socio-economic development, on the one hand, and the other (Unwin, 2009). However, only some studies explore the strategic and tactical role of digital communication technology in the socio-economic growth of community tourism (Rega & Inversini 2016). In this dynamic environment, ICT launches the tourism industry and presents to the world a whole new idea of "smart tourism" (Gretzel et al., 2015; Jovicic, 2019).

Smart tourism means the use of ICT to create creative tourism instruments (Hassannia et al., 2019). In addition to providing a big platform for the growth of the telecommunications and IT industries, this technology would also provide the tourism industry with incredible development opportunities (Jovicic, 2019; Pu, 2020).

Besides, software-based reservation systems, which are ultimately incorporated into multinational booking systems, are one of the most critical components of the tourism industry. These systems provide not only transport facilities but also hotel accommodation, cruise travel, location information, bus, rail and air transport services, exchange rates, weather forecasts, and so on, allowing all large parts of the tour to be reserved. To set up a reservation scheme, tour operators use a range of conventional methods (Yavorska et al., 2019). Moreover, big data has a strong role to play in supporting the transition from conventional tourism to smart tourism as the primary technological source for smart databases. It acts as one of the keys to enhancing tourists' experience in coping with huge tourist information through big data technology and doing a decent job of integrating and evaluating data (Li, 2019). Further, social media technology has become a powerful factor in the expansion of the tourism industry. The influence of social media on tourism can be seen in the way people investigate when they go on holiday. People are welcome to share their travel experiences today. Social media has now changed the way people make decisions as people are developing their trust in a tourism agency focused on peer reviews on such media (Digital Travel Summit APAC, 2020). Furthermore, Rasul, Zaman and Hoque (2020) proposed that social media platforms can be used by tourism marketers to draw clients and enable foreign visitors to engage in online groups that encourage them to travel to new places of interest.

Consequently, the tourism industry is deeply interconnected and highly information-dependent (Pu, 2020). The characteristics of diversified topics, diverse ecosystems, high versatility, and vast volumes of knowledge determine that information infrastructure is needed to facilitate the growth of all levels of tourism activities (Li et al., 2017). In addition, ICT is a wide range of networking equipment, from simple to complex applications like Wi-Fi, Voice Over Internet Protocol (VoIP) and GPS mobile phones and digital cameras, which includes digital and digital broadcasting. ICT offers a wide range of communication technologies. The tourism industry has as many opportunities as ever for e-commerce and e-business. The opportunity to reach a foreign audience and to enter business and e-commerce expertise gained economic output and opened up prospects for growth goods and services (Mowla, 2019).

Contributions of Technology Application in the Tourism Industry for Social Development

The significance of the tourism business in rural advancement is based on the reality that the adequate use of human and natural resources, apart from economic growth, contributes to the promotion of the agro-based industries and the assembly of

indigenous handicrafts and to the initiatives to improve the ecological balance and the protection of the indigenous traditions and cultural heritage in the rural areas (Nooripoor et al., 2020). Digital technologies have provided positive momentum to economies and societies everywhere in the world (The New Age, 2018). Besides, ICT has revised the role and service of the tourism industry (Inversini & Rega, 2016). Besides, a positive and noteworthy connection exists between the growth of tourism and socio-cultural, and economic development (Nooripoor et al., 2020).

With the emergence of ICTs and the rise of the Internet, planning professionals and practitioners have begun to focus on how to use these resources to help socio-economic development processes (Inversini & Rega, 2016). The tourism industry is forced by shifts in visitor preferences and global developments to embrace digitalisation for an economically and socially viable outcome, an environmentally friendly destination and improved consumer loyalty (The New Age, 2018). Theoretical literature has promoted the participation and engagement of local people as a vital resource for sustainable tourism growth. United Nations World Tourism Organization documents (UNTWO, 2017) and in the universal academic research literature on tourism in developing countries and evolving economies, there are fewer indications regarding the contribution of ICT. Empirically, how ICT could expedite and stimulate community- centred sustainable tourism efforts to transform the tourism industry worldwide is less highlighted. However, tourists are progressively dependent on internet technologies for travel search and confirmation of purchase (Inversini & Rega, 2020; Spencer et al., 2012). Indeed, tourism can promote community growth and eradication of poverty as it is labor-centered, inclusive of working women and the unofficial industries, and focused on the geographical traditions and cultural heritage of countyside areas (Inversini & Rega, 2020). Additionally, the digitally advanced tourism industry also contributes to the growth of tourism entrepreneurship, the enhancement of community preferences in destination areas and the effective management of tourism resources (The New Age, 2018). Moreover, tourism plays a key role in community economies and the mobilization of residents (Nooripoor et al., 2020). The extreme societal influence of digitalization in tourism may be the impact on the workforce, which represents one in every ten jobs worldwide (The New Age, 2018).

Contributions of Technology Application in the Tourism Industry for Economic Development

Today tourism has a huge economic impact (Hassannia et al., 2019). Increased demand for tourism leads to a rise in economic growth (Mazzola et al., 2019). Traditionnaly, the development of tourism spots and destinations in developed countries has been guided by corporate firms, mostly in partnership with loacal authorities and governments , which have provided the starting point for tourism to prosper in the region (Park & Yoon, 2009). Governments around the world have

begun to promote efforts to re-qualify remote and emerging regions through specific funding schemes. These projects are also directed at converting the key source of livelihoods for indigenous communities (often focused on agriculture and livestock rearing) and at promoting the concept of tourism and hospitality (Inversini & Rega, 2020; Park & Yoon, 2009). Besides, for several countries and cities, the tourism industry is a significant export industry (Romão et al., 2015) and as a segment of the economy that can benefit from the numerous technical tools available (da Costa Liberato et al., 2018). Such as technology and creativity help facilitate the tourism activities of the destination country for both internal and international visitors (The New Age, 2018). Moreover, greater advances in physical and digital communications have made it possible for the tourism industry to develop enduring connections between places and cultures (Santos & Branco-Teixeira, 2020).

Analysts appreciate the emergence of tourism in the development of rural landscapes endowed with natural beauty: this helps to create infrastructure and services that are mainly utilized by travelers and finally by residents (Inversini & Rega, 2020).In addition to infrastructural and eventually economic growth, other advantages linked to tourism in developing and pastoral areas incorporate the enhancement of knowledge and skills; openness to the world apart from its local vicinity; increased access to primary and higher education, health care, clean water, and transport; and enhanced trust and possession of the industry and the society in which the tourism business operates (Scheyvens, 2007). Thus, tourism development is an opportunity, for the community people, to boost income and employment or to expand basic infrastructures and services (Mazzola et al., 2019).

ICT instruments have accelerated business transaction in the tourism industry by networking with partners, delivery of product services and offering information to prospective consumers around the world. Consumers also use the Internet to receive details and schedule their journey and trip (Mowla, 2019). Therefore, innovative technology will ensure a sustained and balanced growth of tourism in line with the objectives of sustainable development (The New Age, 2018).

Conceptual Framework

Exploring the available literature on the issue of technology applications in tourism and socio-economic growth, we would like to demonstrate the related events in the following framework. Simply, technology applications have a direct impact on the growth of the tourism industry. While there is growth in the tourism industry, it has an ultimate influence on the economic and social development of a county. In addition, it has an immediate impact on social and economic advencement also. Apart from the literature, we assume that social and economic development have an impact on the growth of the tourism industry of a nation urges for more technology application. (Fig. 21.1)
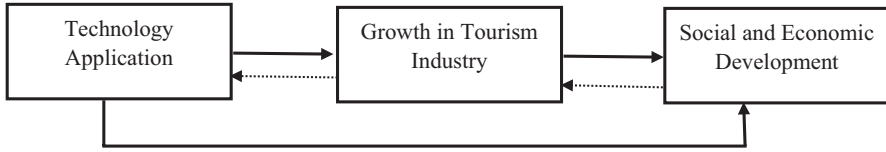
Fig. 21.1 Conceptual framework. (Source: Developed by the authors)

Material and Methods

Qualitative approaches are widely used in tourism literature to synthesize the issues under inquiry (Kim et al., 2018). The chapter is of a qualitative sort based on the review of current findings and publications to provide a better view of the thematic orientation on technology application in tourism and its impact on the socio-economic development of Bangladesh. There were two phases in our data collection process. The first stage was a keyword search for relevant studies in various journals, conference papers, and book chapters from different renowned publishers (e.g. Elsevier, Taylor & Francis, Wiley Online Library, Emerald, Sage, Springer, and IGI-Global). Besides, research notes, editorial articles, dissertations, book reviews and trend reports from different sources were considered for data gathering and analysing.

The second stage involved a keyword search using terms such as "technology application", "tourism", "socio-economic" and "Bangladesh". The second stage was a sophisticated Google Scholar search applying additional keywords including "impact", "ICT", "the Internet", "community development", "economic development" and "tourism in Bangladesh". The collection of data was completed between 25 Nov 2020 to 18 December 2020; and more than 95 relevant articles, book chapters and conference papers were found to write the chapter. Simultaneously, we explored necessary secondary data and statistics from various tourism-related national and global agencies, for example, Bangladesh Parjatan Corporation (BPC), Word Travel & Tourism Council (WTTC) and United Nations World Tourism Organization (UNWTO).

Discussion

Tourism Industry in Bangladesh

Tourism, which is a key industry of the service economy, is widely recognized as contributing factor to social and economic growth and as an advantageous activity for host countries and local communities to deal with unemployment by generating more direct and related jobs and making a significant contribution to rural development, particularly in deprived pastoral areas pressured by the declination of

traditional employments (Lincoln, 2013). Similarly, Mia (2020) articulated that tourism has become one of the fastest-growing service industries and a key contributor to the economy's growth. It provides thousands of employment opportunities, generates foreign currency income, and attracts investment from national and international investors. Tourism has become a growing industry in Bangladesh (Rahman et al., 2018). Gifted with vast natural landscapes and heritage, the Government of Bangladesh has sought to promote tourism and has adopted a number of policies aimed at creating a favorable environment for tourists (Mia, 2020). This may be a significant source of foreign exchange earnings and employment creation for Bangladesh (Rahman et al., 2018). The contributions of the tourism business are multifaceted in the socio-economic growth of Bangladesh, such as GDP contribution, job creation, foreign exchange earnings, infrastructure development, poverty alleviation, new investment opportunities, , government earnings, and social and cultural progress (Karim, 2018; Salam, 2014). In Bangladesh, tourism contributes to a number of areas, such as economic, social, cultural and political policy development (Ferdaush & Faisal, 2014; Karim, 2018). In Table 21.1, we presented some recent contributions to the tourism industry of Bangladesh.

While the contribution of travel and tourism to GDP has fluctuated considerably in last decade in Bangladesh, it has continued to rise between 2000 and 2019. In 2019, travel and tourism added to 4.4% of the total GDP for Bangladesh (Knoema, 2020a). (Fig. 21.2)

As travel and tourism become increasingly important in the global economy, by 2023 its contribution will account for 10% of the nation's GDP (Parveen, 2013). Bangladesh has a great deal of potential to enhance its tourism skills (Haider et al., 2018). Unfortunately, the actual arrivals of foreign tourists and earnings are not at par, and rather are decreasing over the years (Mia, 2020). In Table 21.2, we

**Table 21.1** 2020 annual research by WTTC: Key highlights

Global data 2019	Global data 2019	Bangladesh 2019 key data
Contribution to GDP	10.3% contribution from tour and tourism industry. While the international economy flourished by 2.5%, Travel & Tourism grew significantly more at 3.5%	The Travel & Tourism industry contributed 3.0% of the total economy. Total T&T GDP is worth 772.7 Billion in Bangladesh currency and $9113.2 Million in USD. In 2019 Tourism contributed +6.8%in GDP growth versus in+8.1% real GDP growth.
Job Creation	Throughout the world 1 in 10 jobs is in the tourism industry. Remarkably, one in four net new jobs was generated by Travel & Tourism over the last five years.	The Tourism industry created 1,858,900 jobs till today. The Travel & Tourism industry contributed 2.9% of total employment.
In Bangladesh, visitors spend BDT28.3 Billion (0.7% of total exports) worth USD333.5 Million in 2019.		

Source: WTTC (2020)

Note: All values are in constant 2019 prices & exchange rates as reported in March 2020
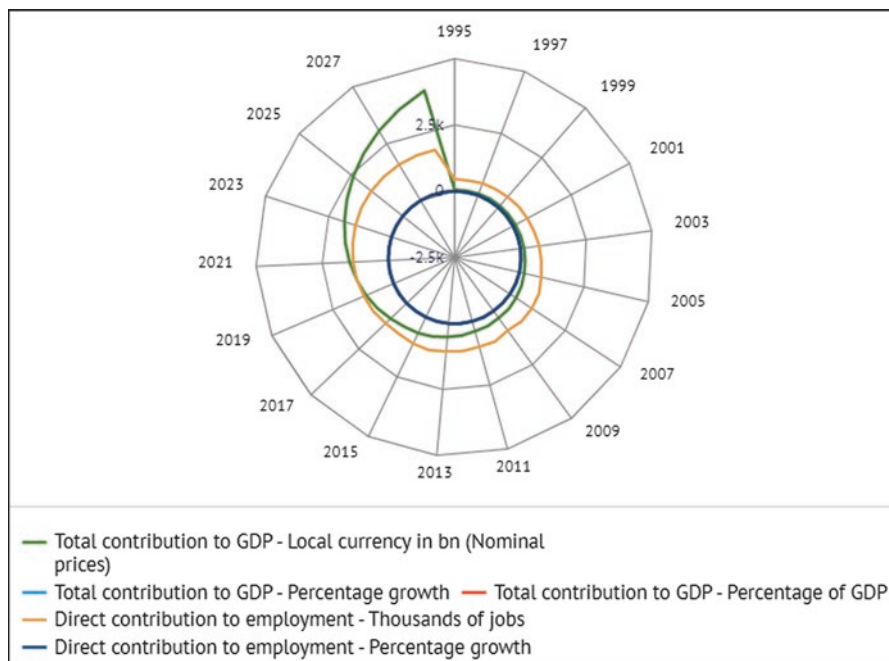
Fig. 21.2 Recent contribution of tourism industry to the Bangladesh economy. (Source: Knoema, 2020b)

Table 21.2 Inbound and outbound visitors in 2019 – Bangladesh perspective

No.	Inbound arrivals	Percentage	Outbound departures	Percentage
1	India	47%	India	59%
2	China	6%	Saudi Arabia	10%
3	Pakistan	6%	Malaysia	4%
4	United States	5%	Thailand	4%
5	South Korea	4%	Singapore	3%
6	Rest of world	22%	Rest of world	20%

Source: WTTC, (2020)
Note: Data are average shares over the 2016–2018 period

presented a recent statistic on inbound arrivals and outbound departures of tourists and visitors in Bangladesh.

Tourism spending is viewed as an alternative to exports, which can boost the balance of payments of a country and promote income and job growth (Mazzola et al., 2019). Thus, more expenditure in the tourism industry surely adds to the economic upliftment of the country. Table 21.3 represents the characteristics of annual expenditure as of 2019 in Bangladesh.

Table 21.3 Travel & tourism industry expenditure characteristics (2019) in Bangladesh

Industry characteristics (2019) as reported in March 2020					
A	Purpose of expenditure	Percentage	B	Nature of expenditure	Percentage
A1	Leisure spending	88%	B1	Domestic spending	96%
A2	Business spending	12%	B2	International spending	4%

Source: WTTC (2020)

Technology Application in the Tourism Industry of Bangladesh

The incremental changes in the preferences of visitors, accompanied by global trends, have driven the tourism industry to adopt largely innovative technologies, socially and economically viable, environmentally responsible and ensure maximum customer satisfaction (Hassan & Ramos, 2020). Owing to its numerous advantages for host destinations (e.g. job growth, sales, infrastructure advancement and cultural shifts, among others), tourism is one of the most crucial industrial sectors in terms of the performance of many economies around the world (Cardoso, 2020). Even in Bangladesh, tourism is one of the cross-cutting economic fields, and ICT has become an invaluable and efficient instrument for managing, distributing, selling, and promoting it (The New Age, 2018). The accessibility to the Internet, computer systems, smartphones and wireless networks have transformed the delivery and use of tourism goods and services (Hassan & Ramos, 2020).

In "megatrends", the world-renowned futurist John Naisbitt predicted: telecommunications in the tourism industry will successfully lead the economic advancement in recent decades, however the combination of tourism variables will evolve into a greater power (Pu, 2020). In several countries of the Asia-Pacific region, the use of social media for tourism marketing is closely linked to the tourism industry success. But in other countries in the region including Bangladesh, it has still not been generalized as a common instrument (Rasul et al., 2020). On the other hand, service providers provide a broader variety of facilities and appealing locations to draw the interest of prospective visitors (The Financial Express, 2018).

The UNESCO World Heritage Preservation Initiative, launched in 2001, is an important example of the application of this technology and was eventually developed to include panoramic virtual reality (VR) tours through the development of panoramic photography, documentary, and virtual reality film database for all UNESCO World Heritage Sites. By taking the opportunity, virtual tourists can visit World Heritage sites in Bangladesh (Cooper & MacNeil, 2008). Owing to the advent of modern technologies, visitors are scarcely faced with a natural catastrophe or any other awkward circumstances (The Daily Sun, 2018). All of these contribute to a digital transition in the tourism industry, where stakeholders have a constructive role in the marketing process (Hassan & Ramos, 2020). The promotion and promotional activities of tourism are now focused entirely on emerging technology (The Financial Express, 2018). Therefore, at present, the deployment of advanced technologies is supportive of the tourism industry (Hassan & Ramos, 2020). Today, millions of tourists can reach any tourism service provided via social

media. Many young tour operators are using YouTube, Facebook, to advertise their offers (The Financial Express, 2018). The successful attachments of customers with emerging innovations are therefore a kind of postmodern marketing capable of leveraging competitiveness and engagement, while also contributing to enhance communication, resource control and overall growth (Hassan & Ramos, 2020). Bangladesh Parjatan Corporation (BPC) has carried out numerous projects in collaboration with the Prime Minister's Office's A2I, including branding, public awareness campaign, YouTube Tourism Channel, and so on. In both hotels and motels, the BPC also provides online tourist services, including online bookings and payments and website alerts. The Redress Scheme for Grievances (GDS) was built to identify and address grievances. Tourists will now lodge grievances and submit proposals to the BPC from anywhere in the world. To resolve and meet the needs of guests, a digital project was set up (The Daily Sun, 2018).

Besides, social media allows individuals to post their travel photos, feedback and comments that inspire other travelers to visit tourist spots in Bangladesh (Karim, 2018). Moreover, with the aid of a digital route map and a global positioning system (GPS), visitors can fly around quickly. Apart from these, tourists should keep out of being fooled in any destination while on the route (The Financial Express, 2018). In addition, tourist lodges, hotels, and administrations throughout the region now have advanced websites which advertise their unique characteristics, handle booking orders, and promote special products for interested consumers. Therefore, the appropriate application of advanced technologies must also be seen as contributors to the tourism industry in Bangladesh (Hassan & Ramos, 2020).

Technology Application in the Tourism Industry for Social Development of Bangladesh

Tourism is a force for peace that promotes awareness and encourages cultural interactions between local people and visitors (Kim et al., 2013). Tourism may play an essential role in fulfilling the goals of sustainable development (SDGs). Specifically, the SDGs 8, 12 and 14 apply to tourism (The Financial Express, 2018). There are numerous social benefits of tourism, which demonstrate positive social effects. These may include the safeguard to local heritage and culture; the boosting up communities; the requirements of social services; the commercialization of art and culture; the renaissance of traditions and art forms (Tourism Teacher, 2019). Besides, positive social effects comprise enhancements in social services, transportation and entertainment facilities, cross-cultural exchange and communication, and enhanced quality of life (Jaafar et al., 2015: Kim et al., 2013). In addition, natural resources and the tourism potential of a destination can be utilized for the economic and social development of the local community (Altinay et al., 2016). Events and festivals of residents are often rejuvenated and developed in response to tourist interest (Tourism Teacher, 2019), which is also present in different tourist spots in Bangladesh.

Surprisingly, the creative applications of technologies can also contribute to a new method of travel collaboration (Mosedale & Voll, 2017). For example, smartphone apps have been created to promote cooperation between tourists at the campsite (Dickinson et al., 2014). These technology-enabled collaboration projects entail not only the consumption of tourism services but also the exchange of ideas among people and cultures, to improve societies and social development (Mosedale & Voll, 2017). Recently, the government of Bangladesh emphasizes the importance of the use of digital technology for the expansion of tourism in the region. The National Tourism Policy 2010 also lays out the key recommendations for the use of emerging technologies in the tourism business in Bangladesh. In this respect, the government has also raised the allowance of spending (The Financial Express, 2018).

Until today, however, Bangladesh has not been very active in using the Internet to promote tourism. The lack of a central tourism website, weak internet-based advertising material, cyber and payment protection problems, lack of qualified staff, disrupted Internet speed, no cyber actions and regulations impede the marketing of internet tourism in Bangladesh (Hossain et al., 2020). In Bangladesh, very few modern technologies are available in the tourism industry. This includes online social networking websites (e.g. Facebook, Instagram, Twitter, and LinkedIn) and online video and image sharing platforms (e.g. YouTube, Pinterest etc.), an online transportation and hotel reservation system, google maps for location monitoring. Though Bangladesh installed mobile-based 4G internet services this service is not available throughout the county, especially in rural tourism areas and hill tracks. Therefore, at present social networks in Bangladesh have prospects to develop more social relations which may contribute to a representation of a broader society, including both positive and negative aspects (Mosedale & Voll, 2017). New media, in contrast, also supports the development of tourism. Besides, due to new media, a huge number of entrepreneurial practices are also evolving and the ambitions of young people and local tourism are rising in Bangladesh. Both urban and rural areas lead to the government's achievement of the SDGs and the alleviations of poverty (The Daily Sun, 2018). Thus, technology-based tourism encourages the communities in Bangladesh a real sense of belonging and identity. Above and beyond, it is allowing local people to maintain their rituals and their history (The UZ Bangla, 2019).

Technology Application in the Tourism Industry for Economic Development of Bangladesh

Tourism is one of the most promising industries to accelerate GDP growth in Bangladesh (Das & Chakraborty, 2012) and using new technology in all areas of tourism is now indispensable (The Financial Express, 2018). The economy of Bangladesh is booming where the tourism industry is still less privileged but rising. In these conditions, IT can affect the process of developing an international

network, which can eventually stimulate the process of economic development (Mowla, 2019). Tourism may provide the community with direct employment, for example, tour guides and hotel housekeeping. Besides, employment is created through other industries like agriculture, food production and Small and Medium-sized Enterprise (SME) (The UZ Bangla, 2019). Recently, examining the connection between economic growth, tourism income and financial development for the period 1995–2016 in Bangladesh, Habib, Sharif and Hossain (2019) concluded that the economic growth in Bangladesh is driven by tourism income and financial progress to some extent. With the support of technology, the development of new tourism entrepreneurs, poverty reduction, women's empowerment and the growth of environmentally friendly, sustainable tourism are possible. As a consequence, tourism can be properly developed in Bangladesh as well as around the world with the proper use of digital technologies (The Financial Express, 2018). The government of Bangladesh has recognized tourism as a way of creating jobs and foreign exchange (Lincoln, 2013). Particularly, the 17 tourism SDGs can be divided into broad categories of economic (goals 1, 7, 8, 9, 10, 11, 12), social-cultural (goals 2, 3, 4, 5, 16), governance (17), and environments (goals 6, 13, 14, 15) (Ali et al., 2020). The modern-day information society hasrendered tourism a highly information-intensive industry and ICT has a latent influence on the tourism business (Mowla, 2019). Since, Bangladesh is an agriculture-based economy (Ferdous et al., 2020; Haque & Jahan, 2016), ICT may be used to expand industries in places that benefit SDGs, such as agriculture-based tourism businesses (Ali et al., 2020). With respect to economic SDGs, technology will open up market prospects for cities and industries that have not had such opportunities before. Likewise, small traditional crafts manufacturers learn how ICTs serve to sell and export products. Secondly, e-commerce and its precursor developments provide possibilities for ICTs to create digital markets to handle and simplify supply chains, to increase efficiencies and to expand previously restricted markets for businesses in the developed world (Mowla, 2019). This offers people economic stability, job prospects and increases their ability to deal with uncertainties (financial and health) and their quality of life by offering a greater variety of entrepreneurial development opportunities (Ali et al., 2020). Besides, ICT has provided new means and facilitated new distribution channels, thus establishing a new business atmosphere (Mowla, 2019).

Implications of the Study

The economy of Bangladesh is booming recently, and it is highly dependent on the agriculture and service industry. However, tourism as an emerging industry gets insignificant attentions to transform this industry into a top contributor to the economy. Thus, developing the tourism industry is a win-win policy, contributing to job creation, infrastructure development and enhancing the country's sustainability (Akhy & Roy, 2020). Besides, our investigation finds that there is a great deal of evidences that technology adoption in the tourism industry has a greater

contribution to the social and economic growth of the county. Therefore, to bring more social, cultural, and economic growth the industry should focus more on technology application. Besides, the demand and supply of tourism products and services depend on many different variables, technology is one of them. Bangladesh as a tourists' target destination is expected to redesign its products and services, as the country is experiencing a quick increase in domestic visitors, most of whom benefit from disposable income and the adequacy of recreational time (Hassan & Ramkissoon, 2020). Now, Bangladesh's tourism industry should aim to draw more visitors from abroad, as it has the potential to attract tourists with foreign interest. To do so, technologies may work as a superior weapon as they may cooperate to circulate information regarding the spots and available services at the destination point. Therefore, concerned stakeholders should concentrate more on technology deployment in the industry to lift the industry and ultimately boost up the socio-economic development of the country.

Conclusion

This study tries to explore how technology adoption in the tourism industry brings about socio-economic development and to what extent Bangladesh has incorporated technological innovation in promoting tourism products and services and where it is lagging. Previous empirical researchrs have recognized that tourism is positively inked to socio-economic development and have also demonstrated some promising aspects of technological incorporation in the tourism industry. The rise of the tourism industry has created avenues for gender-inclusive employment generation, reaping the full potentials of the host communities, new travel ventures and tourism enterprises, the expansion of utility facilities and infrastructures in tourist spots, a standard lifestyle of host communities, cultural exchange and knowledge sharing, growth in GDP and export earnings and so on. Thus, this industry is fostering the social and economic prosperity of a country.

Since information is considered to be a crucial catalyst for the growth of the tourism industry in the modern era, the integration of ICT and innovative technological resources has just brought a new dimension to the advancement of this field. Software-based reservation systems, Wi-Fi facilities, VoIP and GPS cell phones, information sharing through social media, advanced technological entertainment options, interactive tourism, e-business and e-commerce, etc. are some of the ICT contributions to the promotion of tourism goods and services.

Technology has made traveling more convenient and entertaining for the tourists and paved a way for efficient income generation from tourism businesses. Ultimately, the application of technology has established an interconnection with tourism and socio-economic development. From the discussion above, it has become evident that when a country achieves socio-economic growth through the expansion of tourism, then it may invest more in the industry to achieve more sustainable growth both socially and economically. In addition, more technology application in the tourism

sector leads to growth in this industry, then the investor would invest more in technology as a means for further growth.

Bangladesh also has the potential to become the hub of visitor attractions because of its natural beauty and indigenous cultural heritage. However, the impact of the tourism industry to its GDP is not noteworthy, but this sector has shown positive trends in recent years. Many tourist destinations have been identified and tourism-related industries have expanded dramatically in these regions. Therefore, Bangladesh may follow the conceptual framework to be socio-economically developed through investing more on tourism technologies. It is a good sign that Bangladesh has recently made its first move in the digitalization phase of delivering services to achieve the goal of Digital Bangladesh by 2041. It may attract more tourists by developing informative websites and portals, the software-based reservation system, the e-payment system, the internet, and computer technologies which make it much simpler for visitors and tourism firms to avail their desired services. However, Bangladesh still lags in global competition in terms of the adoption of cutting-edge technologies and new value-added services for virtual tourism. Besides, absence of up-to-date, credible, and multi-language contents on the website, poor website interface, unstable mobile network connection and poor bandwidth, absence of proper information security, insufficient ICT specialists, deficiency of qualified and professional personnel, constraints on mobilizing financial resources, bureaucratic complexities between various ministries, etc. are typical obstacles in the development of ICT based tourism industry of Bangladesh.

However, similar to several studies, some shortcomings have also been found in this investigation. The inaccessible and inestimable nature of data is one of them. Secondly, a quantitative approach would be the best fit for the study, but this investigation draws its conclusion based on a qualitative analysis of previous studies available on the internet only. Further, if research could include experts' opinion and/or other stakeholders of both the ICT and tourism industries to estimate how technology application in the tourism industry is supporting to the socio-economic development that may provide more comprehensive knowledge. Therefore, future researchers may address the limitations encountered in this study to have a clearer understanding of the topic. To be specific, future researchers may use a quantitative research design by considering data from the stakeholders (e.g. tourism business firms, staffs, economists, ICT experts, marketers, NGOs and concerned agencies).

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Part IX
Challenges, Suggestions and Future Research Directions

Chapter 22
Application of Innovative Technologies in the Tourism and Hospitality Industry of Bangladesh: Challenges and Suggestions

Md. Ashikur Rahman Avi and Sazu Sardar

Abstract Application of Innovative Technologies (ITs) in the tourism and hospitality industry means using digital and innovative devices in completing multiple functions of the industry. Notwithstanding the excellent progress made in technological innovation, it is still in the early stage in the tourism and hospitality industry of Bangladesh. As a pioneering study in this area, this chapter aims at identifying the challenges and issues that are faced by the tourism and hospitality industry associated institutions in applying ITs in their business operation. In doing so, this qualitative study utilizes an in-depth interview technique in securing opinions from the tourism and hospitality stakeholders. The chapter finds some challenges as: (i) willingness and support from top management; (ii) inadequate governmental support; (iii) poor service quality of the Internet Service Providers (ISP)/ poor speed of the Internet; (iv) high cost of installation; (v) high price of hardware and software; (vi) high maintenance cost; and (vii) lack of technical knowledge both of the employees and clients. The suggestions outlined in this chapter are formulated based on the principle of successful tourism and hospitality business operation through the application of ITs, which will help the tourism and hospitality industry practitioners and policymakers in formulating policies and business strategies. Thus, this study can contribute to improve the present condition of IT application in tourism and hospitality industry of a developing country like Bangladesh.

Keywords Innovative technology · Challenges · Suggestions · Tourism and hospitality industry · Bangladesh

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Introduction

The present world is advancing in such a completely unimaginable way. The modern context of communication and networking among citizens is strikingly altered with the emergence of the internet and innovative technologies (Fawkes & Gregory, 2000; Harrison, 2014). Nowadays, technological innovations such as User Generated Content (UGC) and feedback, social media consolidation, Global Positioning Services (GPS), and Artificial Intelligence (AI) play a key role for transfiguring citizens' experience, their consumption pattern, and way of sharing information (Ruiz et al., 2018). In fact, the introduction and implementation of internet-led technological devices in product, service, and other business fields have brought a technological revolution around the world. This revolution has already profound implications for the tourism and hospitality industry as well, and a whole system of internet and technovations has rapidly spread across the tourism and hospitality associated sectors (Law et al., 2014; Buhalis & Jun, 2011; Buhalis & Law, 2008).

Innovation in tourism is developed through the use of innovative technologies and it completely shifts the industry landscape as well (Ayeh et al., 2013). According to Buhalis (2003) and Sheldon (1997), the application of innovative technologies in the tourism and hospitality industry has enabled organizations to make their daily activities efficient. At present a lot of technologies such as Augmented Reality (AR), Virtual Reality (VR), AI (robotics), wireless smart technologies, mobile or smartphone-based software applications, Machine Learning (ML), social media platforms, big data, Internet of Things (IoT), and Internet of Everything (IoE), etc. are being applied in the tourism and hospitality industry around the world (Buhalis, 2020; Buhalis & Foerste, 2015; Morozov & Morozova, 2015; Rasoolimanesh et al., 2019) and these technologies are applied in marketing tourism and hospitality offerings (Dadwal & Hassan, 2015; Hanks et al., 2016; Marasco et al., 2018; Seric et al., 2014; Williams & Levitt, 2019), enhancing hotel guests and tourist satisfaction (Cobanoglu et al., 2011; Kyatham, 2020), fulfilling tourists or safety and security needs (Myers, 2019; Nandi, 2019) and so many fields. Besides the invention and application of these smart digital devices, touristic demands become smart which makes pressure on tourism and hospitality managers to take assistance from technological devices for delivering smart services to enhance their service efficiency and improve customer satisfaction (Quarshie & Amenumey, 2018). It is well recognized by the works of literature that the application of innovative technologies in the tourism and hospitality industry poses new challenges and facilities for tourism and hospitality business (Ashari et al., 2014; Buhalis, 1998; Hojeghan and Esfangareh, 2011; Kounavis et al., 2012; Law et al., 2014; ; Morais et al., 2016).

Considering these views, this chapter aims at identifying the key challenges which are faced by the stakeholders of tourism and hospitality industry associated institutions in applying ITs in their business operation in the context of a developing country, Bangladesh. Though the principal objective of this chapter is to identify the issues that are creating impediments in applying innovative technologies in tourism and hospitality industry of Bangladesh, the study also targets to cover following

specific objectives, firstly, to explore the present scenario of technology application in the tourism and hospitality industry in Bangladesh, secondly, to identify the major complications that the industry is facing while applying technologies in Bangladesh, and finally, to generate suggestions from the stakeholders that can eradicate the challenges to apply technologies in tourism and hospitality associated industries in Bangladesh.

To address these chapter objectives, this chapter followed a qualitative research method where an in-depth interview approach was utilized to secure the opinion of the stakeholders. For this study, the purposive judgment sampling technique is used to sample populations as Churchil et al. (2010) endorsed using purposive judgment samples in an exploratory study. In total 20 participants were interviewed and the participant category covers 10 hoteliers, 5 tour operators, and 5 travel agents. The duration of each interview session was 30–35 min approximately. After completing all the interview sessions, the audio files were coded, then transcribed and from those transcriptions, only the necessary information is presented in this chapter. Besides, a lot of relevant secondary works of literature are reviewed to supplement the chapter objectives.

Some Common Challenges of Technology Application in the Tourism and Hospitality Industry

According to Kim and Hardin (2010), the digital technological world presents challenges associated with technology maintenance and follow up. Technology requires huge investment in terms of updating the links and responding to many blogs (IvyPanda, 2020). Because of technological advancement, proliferation has increased significantly and now many tourist websites are available on the internet which is a challenge particularly to Small and Medium Enterprises (SMEs) associated with the tourism and hospitality industry that possess inadequate skills and knowledge in website efficiency (IvyPanda, 2020). According to Buhalis and Law (2008), for technological advancement, electronic intermediaries are emerging rapidly and increasingly challenge traditional distributors of tourism services. Technological adaptation and implication need huge investment which may create a challenge for the mid-ranged tourism and hospitality business firms. In this regard, Soares et al., (2020) argued that the new smart tourism and hospitality paradigm (Buhalis, 2020; Buhalis & Leung, 2018) creates challenges for the companies associated with the tourism and hospitality industry to make huge investments in modern technology. Data security poses another challenge to tourism and hospitality service providers (Chen, 2013). Added to this Buhalis and Law (2008) stated that payment security and privacy concerns are one of the major challenges which dissuade customers from online transactions. In this regard, Mills et al. (2002) and Buhalis and Law (2008) also suggested that tourism and hospitality business organizations must pay more attention to defending itself and its customers from

cybercrime losses such as spamming, identity theft and hacking booking data, credit card numbers, card authentication codes, etc. So it is evident that the common challenges of technology application in tourism and hospitality industry includes high maintenance costs, requirement of huge investment, skills and knowledge to operate technological devices, poor data security, payment security etc.

Present Scenario of Technology Application in the Tourism and Hospitality Industry in Bangladesh

In the last couple of years, significant development has been made in Bangladesh through the use of technology in several sectors. The establishment of a lot of high-tech Parks, information and service digitization, the formation of e-Governance, and series of initiatives evident that Bangladesh is advancing in information technology (Prothom alo, 2019). The country has recently witnessed considerable growth in the number of internet users (The Financial Express, 2018), and a noticeable rise in the number of internet users and mobile or smartphone users is also seen (bdnews24.com, 2020). According to Ahmed et al. (2015), the number of mobile or smartphone software application users has simultaneously increased with the growth of the Internet, mobile phone, or smartphone users in Bangladesh.

The impact of this continuous advancement of information technology also noticed in the tourism and hospitality sector of Bangladesh (Howlader, 2018). Nowadays, a lot of mobile or smartphone-based software applications are used particularly in the tourism industry. In Bangladesh, by using mobile applications tourists can easily fulfill their financial needs, buy or reserve transportation tickets, order foods and beverage items and get them delivered at their doorsteps, reserve their desired hotel rooms and complete so many necessary tasks. According to Howlader (2018), the travel agency and tour operators in Bangladesh are applying innovative technologies for the promotion and marketing of their products, packages, and services. He added that Bangladesh Parjatan Corporation (BPC), a government tourism organization of Bangladesh, has started applying innovative technologies in destination branding, hotel booking, bill payment, creating public awareness, and other touristic services. On the other hand, Bangladesh Tourism Board (BTB), the national tourism organization of Bangladesh responsible for tourism promotion and marketing, has started penetrating on social media marketing (Daily Sun, 2017), and only for the digital tourism marketing campaign, BTB has announced two new websites which are www.tourismboard.gov.bd and www.visitbangladesg.gov.bd (Bangladesh Tourism Board, 2018). Also, BTB has introduced mobile software app namely "Beautiful Bangladesh" as a one-stop solution for the tourists (Daily Sun, 2017). But the performance analysis result of BTB conducted by Muneem et al. (2019) reveal that BTB fails to perform its' tourism marketing tasks through websites, attending tourism fairs, etc.

The application of AI technology is also noticed in the hospitality industry particularly in the restaurant business in Bangladesh. To enhance customer satisfaction and providing the best services to the customers, Mexwel Robot Restaurant has installed two robots as a waiter in their restaurant in the country's capital (The Daily Star 2017; Rabbi, 2017).

The application of VR technology in the tourism sector particularly in the amusement park is recently noticed. According to The Daily Star (2019), the Fantasy Kingdom, one of the most popular amusement parks of Bangladesh, has introduced such technology through which visitors can experience 9D (VR) movies and games.

Besides these aforementioned technological implications, a lot of web-based solutions are also available in the tourism and hospitality industry of Bangladesh.

Challenges of Innovative Technology Application in the Tourism and Hospitality Industry in Bangladesh

The interview participants identified some major challenges of technology application in the tourism and hospitality industry in Bangladesh which are presented in this section. The following Fig. 22.1 summarizes the key issues in the tourism and hospitality industry in Bangladesh.

Almost every interview participant repeatedly identified a lack of willingness of the top management as a major challenge of the introduction and application of technology in most of the tourism firms in Bangladesh. Most of the participants said that the owners of the property or the higher authority of the management does not aware of the effectiveness of the technology in the tourism and hospitality business field. A tour operator category participant (Interview no. 10) commented that- 'The Managing Director (MD) of my tour operating organization thinks that having a Facebook page for online promotion and using a computer is enough to attract the potential tourists; even he (MD) is not interested to create a website containing
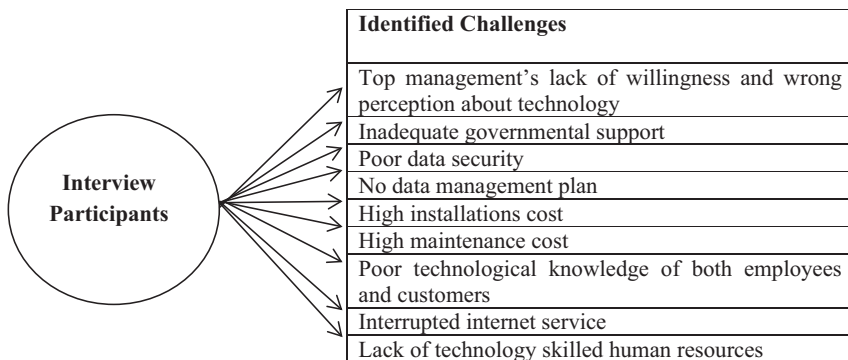

Fig. 22.1 Participants' identifications of challenges. (Source: developed by the authors, 2020)

reservation facilities and other up to date features.' With a similar tone, another participant shared his/her experience as follows:

> ...when I submitted a bill for repairing our Digital Lawn Mower (grass cutter machine) to the head of accounts, he said, oh! It seems like an elephant that is consuming our profit and increasing cost day by day. I (the head of accounts) will request the Chairperson to remove this elephant from our resort (Interview no. 7).

The issues such as having no data management plan and poor guests' data security was also pointed out by most of the participants as major challenges of technology application in the tourism and hospitality industry in Bangladesh. A front office executive (interview no. 8), hotelier category participant, said that

> sometimes we serve some guests who are reluctant to use their credit card for paying their bill and I several times noticed their insecurity feeling in e-payment transaction, even, in some cases, guests do not want to provide their contact numbers, and instead they prefer providing their email address.

Almost 80% of participants mentioned inadequate support from the government as another major challenge of technology application in the tourism and hospitality industry in Bangladesh. Most of the participants argued that the import tax and installation cost of technological equipment necessary for the tourism and hospitality industry are very high but there is no short term or long term basis soft financial support from the governmental part particularly for the hospitality industry. For instance, a hotelier category participant commented that

> we have to do every sort of arrangement by our initiative and we do not get and direct or special support for our sector form the government.

Besides the "interrupted internet speed" and "unavailability of Wi-Fi zone in most of the tourist destinations" were marked as important issues by many participants. In this regard, a travel agent category participant's (Interview no. 17) comment is the following:

> …our neighboring country India has free internet facility for the tourists in various tourism destinations. Even, almost all the railway stations in India have Wi-Fi facilities. It is very convenient for foreign tourists particularly. But unfortunately, such facilities are not available in most of the tourist destinations of our country.

The participants also mentioned tow more issues of technology application in the tourism and hospitality industry in Bangladesh which are "low technological knowledge of both employees and customers" and "lack of technically skilled human resources". According to most of the participants, the employees and customers face difficulties in handling advanced technological devices. For example, a hotelier category participant (Interview no. 18) commented as follows:

> …most visitors run into trouble opening the door by using the key card.

Added to this, another participant noted that-

> In the hospitality sector, we have a huge shortage of technically skilled manpower. We recruit the freshman and then invest huge time and money for their training purpose but after spending some period they switch to other properties for better benefits….

Besides identifying the challenges, the participants also generated some suggestions which are outlined in the next section.

Some Suggestions to Challenges of Innovative Technology Application in the Tourism and Hospitality Industry in Bangladesh

To overcome the challenges associated with the application of innovative technologies in the tourism and hospitality industry of Bangladesh, several suggestions have been identified in this research as listed in Fig. 22.2.

Most of the participants believe that creation of awareness for the application of technology in tourism and hospitality industry in Bangladesh can be effective to change the perception of the higher authority or management of the tourism and hospitality affiliated institutions. Who will create awareness? In response to such a question, most of the participants provided their opinion as follows:

> The Ministry of Civil Aviation and Tourism (MoCAT) can take the responsibility of creating awareness in this regard. The MoCAT can organize several seminars or meetings with the owners or managers of the hotel, motel, resort, travel agent or tour operators in Bangladesh and take necessary steps to make them understand that the application of innovative technologies increase operational efficiency, save time and cost, maximize organizational profit, and enhance customer satisfaction (Interview no. 15).
>
> ...I think two national tourism organizations of our country, Bangladesh Tourism Board (BTB) and Bangladesh Parjatan Corporation (BPC) can play a significant role in creating awareness for technology application in the industry (Interview no. 9).
>
> The Government of Bangladesh can play a strategic role in this regard. Either GoB can enforce all the tourism and hospitality institutions for the mandatory application of technology or digital devices in their business operation or can offer lucrative facilities such as reduction of accommodation tax, interest-free loan, etc. so that the property owners become motivated. (Interview no. 19).

To ensure the security of the employee and guest data, the formulation and implementation of the cyber act, data management and storage master plan were
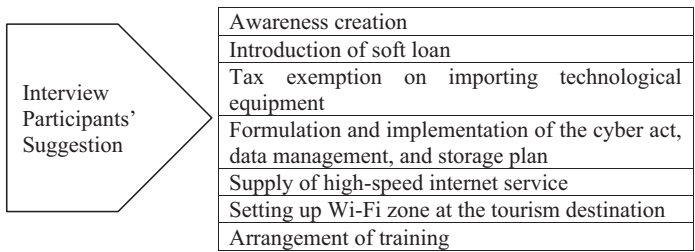
Fig. 22.2 Suggestions from the participants to overcome the challenges of innovative technology applications in the tourism and hospitality industry in Bangladesh. (Source: interview results synthesized by the authors, 2020)

suggested by most of the participants. In addition, most of the "travel agent" and "tour operator" category participants highlighted that high-speed internet service is the prerequisite for technology application in the tourism and hospitality industry. A travel agent (Interview no. 14) argued that

> the availability of high-speed internet helps us to do business in the virtual platform as often we need to buy air tickets, reserve hotel rooms, etc. on demand of our clients.

Arrangements of several training programs to create basic technology skilled human resources at divisional, regional, and local levels can be effective to overcome the challenge of human resources shortage are suggested by most of the participants. Moreover, a participant (Interview no. 19) opined that- 'the ICT division of GoB can arrange a series of training programs access to information (a2i) program for the existing staff of hotels, tour operators, travel agents, tour guides and the industry associated entrepreneurs.' Besides, some hotelier category participants also suggested providing easy users guide or manuals to the guests for easy use of advanced technological devices.

Conclusion

The application of innovative technological devices and systems have brought a new revolution and significantly redefined and reshaped the nature, scope, structure, and style of the tourism and hospitality associated business organizations around the world, though technological implications reveal some challenges. Compared to the advantages, the challenges of technology application are very few.

In the case of Bangladesh, notwithstanding the excellent progress made in technological innovation, it is still in the initial phase in the tourism and hospitality industry. The wrong perception of the higher authority regarding technology applications, inadequate governmental support, no data management plan, poor data security, high installation costs, high maintenance costs, interrupted internet service, lack of technically skilled human resources, and poor technological knowledge of both employees and customers, etc. hinders technology adaptation and application in tourism and hospitality sector of this country very badly. This existing scenario can be ameliorated by creating awareness among the tourism and hospitality elite stakeholders, introducing soft loan, exempting tax on technological equipment import, formulating and implementing cyber act, data management and storage plan, ensuring high-speed internet supply, providing Wi-Fi facilities at the tourism destinations, and creating technology-skilled human resources through proper training, etc. The policymakers, stakeholders, and researchers of the tourism and hospitality industry can follow the chapter findings and conduct a further study regarding the role analysis of the government and nongovernmental bodies linked with the tourism and hospitality industry to eliminate the challenges.

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Conclusion

This book is aimed to outline the application of technology in the tourism and hospitality industry of Bangladesh followed by some suggestions. Findings of this book are wide and comprehensive to present both the present and future scenario. Contents of this book covers the context, concept, the present scenario, product and service offer, roles of the public and private institutions, social media, networking, connectivity, sustainability practices, tourist experiences, challenges, and suggestions based on some key findings.

Major findings of this book comprehensively confirm the increasing roles of digital technology for tourism marketing and promotion in Bangladesh. The GoB is yet to formulate and implement an innovative tourism technology dedicated NTP. The number of tour operators, and travel agents is increasing with adequate capacities to sell their package tour offers with the use of digital platforms like the Internet, social media, websites etc. Tourists in Bangladesh are now abler to purchase, to collect travel tickets, and to enjoy the entire decision making and purchase process staying at their home without hassles. Also, tickets with boarding pass are provided online so tourists can collect them with less efforts by saving both time and costs. All of these can possibly support the gradual and sustainable growth of the tourism industry with the support of adopting the latest innovative technologies as well as to offer positive tourist experiences.

Obviously, the tourist experience is the central to the tourism industry. Tourist experience is very sensitive that can either make or break any business. Thus, fine-tuned tourist experiences can influence the creation of loyal and repeated tourists as customers who can boost the business through word-of-mouth. With negative experience, tourists can be dropped out at the pre-booking stage. Thus, the web interface where the tourists book their holidays till the very last day of the journey demands to remain as much enjoyable as possible. With the support of new technologies, numerous options are made available to enhance tourist experiences. This ever-broadening array of options for tourists become more vital for generating positive tourist experience in Bangladesh. On the ground of good tourist experiences,

tourism business and entrepreneurs of Bangladesh can also be encouraged and benefitted.

Any aspect of the involved business in the tourism industry, both the tourists and the entrepreneurs need adequate knowledge about the likely changes. Products, concepts, and services that were popular in earlier times can go out of the shelf soon followed by the replacement of more updated and modern elements to capture more of the tourist attention, meeting their demands, and to enter into new markets with potentials. The understanding and using of the latest innovative technologies, tourism business entrepreneurs can become able for keeping pace with rivals, and can even gain an edge over a few. Such use of the innovative technologies can simultaneously improve tourism product and service offers to an unprecedented height. New technologies, new destinations, and means of transport cause mentionable shifts in the tourism industry. Thus, the prior adoption of new technologies and trends is important. In order to keep the pace with such emerging tourism trends and technologies, businesses need to stay competitive and have to cater the tourist demands effectively. Still, a few of the tourist demands are evolved and priorities have shifted, and a whole set of new requirements emerges.

The application of digital technology can allow the movement of the Bangladeshi tourism industry way forward. By creating new tourism enterprises, poverty reduction, empowering women, and environment-friendly sustainable tourism industry, Bangladesh cannot be featured as doing remarkably well. Thus, if the tourism industry can be developed systematically and in proper ways, the country can achieve a compact position in the global tourism industry.

The book informs that for avoiding the possible left behind, it is important that stakeholders and policy planners of the tourism industry can be able to keep up with the latest and most useful digital trends. To embrace the latest tourism trends has become a factor of success in the tourism industry. Using innovative technologies have offered both the tourists and tourism business entrepreneurs with ease and comfort. Thus, the adoption of the latest technologies can never be too early for creating a successful tourism model to create opportunities.

Effective application of innovative technologies needs to be ensured for reaching this set goal. The upcoming trend in tourism will demand for personalized services with digitalization and the application of technology. The use of voice search and voice control can appear to meet tourist demands as well as home Smart speakers are becoming more useful. Also, mobile or digital assistants like Google Assistant, Siri, and Bixby have made more tourists to turn for voice search. For the tourism product and service providers, attracting tourists with properly structured website contents has importance. Thus, voice search becomes useful for allowing voice bookings. Tourists are made capable to add IoT based devices to hotel rooms, can create an AR app for guiding them around the holiday destinations. Data and information availability for tourists is a major part of tourist experience. No mentionable number of businesses of AI and voice control operates in Bangladesh when hotel room with Smart speakers or relevant IoT devices and compatibility with voice control is a recent tourism technology trend. These can allow tourists for turning devices on and off, or changing settings within their rooms more easily. Along with

possibilities and opportunities, the tourism industry has to tackle possible draw-backs and crisis. A brief summary of chapter wise findings of the book is presented below:

Chapter 1, on the basis of literature review and in-depth interview outcomes, identified the factors and developed eTAM. This model is expected for providing the key structure of tourists' adoption of technologies for meeting their demands and satisfaction. This eTAM is also believed to support the concerned tourism agencies to formulate policies, asses demand and supply, and guide for sustainable tourism development. As a model, the development of eTAM suggests for measuring the economic impacts of eTAM in Bangladesh as well as in the wider scenario of the South Asian countries.

Chapter 2 finds Augmented Reality (AR) as a technological innovation and eMarketing staying at the Early Majority Stage, and Network Structure as the key influential component in the context of tourism and hospitality industry of Bangladesh.

The mixed method research based Chap. 3 findings show that the Internet is the most crucial technology in tourism that can be accessed through cable-television, mobile telephones, fixed telephones, conventional personal computers, and laptops. The research finds that information can be readily available 24/7 that can result cost transparency to enable consumers for making more informed choices. This research offers a summary of some key marketing points for promoting potential tourism technologies in Bangladesh.

Chapter 4 finds the tourism and hospitality industry of Bangladesh's possible paradigm shift as the outcome of IT application in coming years. This chapter offers some relevant suggestions to overcome any possible challenges like COVID-19 pandemic. This chapter places a benchmark for both the stakeholders and policy-makers of the tourism and hospitality industry in Bangladesh.

Chapter 5 argues that the use of innovative digital devices can become the key for a developed tourism and hospitality industry. Technology has been performing crucial roles in this industry. The proper application of innovative technologies can promote operational performance, improve customer experience and service quality, as well as reduces costs, automates operational tasks, and saves time etc. Bangladesh is benefitting from the application of technologies in many industries but such application still remains as nascent in the tourism and hospitality industry. This literature review based research presents the existing scenario of innovative technology application in the Bangladeshi tourism and hospitality industry.

In Chap. 6, the authors inform that newer innovations in digital technology are expediting the global tourism industry's further moves. The authors also mention some relevant examples as AR or VR, IoT, AI, Robotics, block chain, sensor technology, user generated contains (social medias) that help the reformation of production, distribution and consumption approaches in tourism. The chapter finds that technological innovations strategically are able to promote tourism destinations. This literature review based chapter makes some suggestions for an advanced tourism industry with the application of technological innovations in Bangladesh.

Chapter 7 finds that the application of technology in agri-tourism can allow tourists for discovering new destinations, planning their vacations, learning about food production and farming, as well as knowing the application of modern agricultural operations.

Results of Chap. 8 find that perceived trustworthiness has a robust positive effect on attitude towards ecotourism as followed by perceived ease of use and social influence. This study is a useful contribution towards the better understanding of the factors that can influence attitudes towards ecotourism as well as can contribute to future ecotourism research.

Chapter 9 as an anthropological research methodology based chapter explores the application of IT for promoting indigenous gastronomy in the CHT. Also, the chapter illustrates the application if social media for developing indigenous gastronomy in this major tourist hub of Bangladesh. This research finds that business enterprises related to food in the CHT adopt both online and offline marketing strategies.

Chapter 10 finds that visitors who visit this religiously significant site are usually more interested in learning about it. Interpretation of the cultural history and richness of this place, accompanied by local community engagements, can be beneficial. Creating a storey for them will help a destination gain a competitive advantage over its rivals, and it can be told to the consumer across a variety of marketing communications and platforms. The Buddhist Vihara in Paharpur, Bangladesh, is a holy Buddhist site that can be interpreted using AR. The study indicates that with successful involvement of the Buddhist tradition, sustainability problems arising from AR understanding can be minimized.

Chapter 11 findings outline that AR application comes with perceived positive benefits like aesthetic, economic, experiential, cultural & historical, educational value. The study also presents some major challenges to manage the site, visitors' incapability, financial and informational challenges that can hinder AR application. A relationship between AR application and sustainability is also found. The chapter suggests that the implementation of AR application at this case site can benefit the stakeholders (i.e. visitors, local community, employees, and tour operators etc.). The chapter mentions some limitations and directs future research studies.

Chapter 12 shows that the GoB has taken several initiatives for making the visa and immigration systems online. The country focuses on developing ICT to implement its national vision to attract more tourists from foreign countries and the expatriate Bangladeshis. This chapter makes some suggestions for the application of technology for visa and immigration system for tourists in Bangladesh.

Chapter 13 as the literature review based chapter finds that the institutions in this industry can play crucial roles to apply innovative technology in many ways including marketing and promotion of tourism and hospitality offerings, by delivering quality services, by disseminating necessary information, by managing tourists or guests, by ensuring the safety and security of tourists, by assuming tourists' perceptions, by building employee capacity, by providing training to employees, and so on. Outcomes of this research expect to help policy-makers and planners, as well as

the public and private institutions, and service providers of Bangladesh for applying innovative technology effectively in this important industry of the national economy.

Chapter 14 reveals that, SM can have positive impacts to motivate tourists to travel. Also, SM supports tourists for getting relevant travel information (i.e. destination selection, accommodation, financial planning, culture of the place, food etc.). As a result, along with positive aspects of SM in tourism, the chapter finds some challenges that the young tourists face. The chapter makes some recommendations for ensuring SM as a more reliable source for the tourist for travel decision making with the support of SM.

Findings of Chap. 15 present that social media interaction with the tourism administrators and stakeholders can generate positive influence on tourism promotion. This research finds out that with social media, both tourism administrators and stakeholders become able for facilitating tourist destination promotion by sharing the experience of satisfied tourists. The chapter shows that social media can turn tourists into partners for designing, developing, marketing and producing better tourist experience.

According to Chap. 16, social media can influence tourists' travel decisions. The Internet wipes out the geographical distance and border limitations, and brings people under one umbrella. The Internet also supports the development of regional networking infrastructure across the world. Conventionally, some responsible travelling motivators for future tourists are shared opinions about destinations, photographs, and reviews after traveling. Domestic tourism in Bangladesh witnesses an influx as partially influenced by the positive digitalization programs that help tourists for availing necessary information for their travel arrangements. The tourism industry in Bangladesh also works for promoting their services through online mediums for reaching target markets.

In Chap. 17, the authors reveal that indigenous knowledge and practices that the locals bring in tourism business in the coastal regions of the country can help. Findings show that coastal tourism business enterprises in Bangladesh can be effected from global climate change. This research also shows that as the national economy of Bangladesh is not fully dependent on the tourism and hospitality industry, ill effects from such climate change can be comparatively minimum than many other countries. The research proposes for using indigenous knowledge and practices in the national action plan of Bangladesh for tackling climate change effects.

Chapter 18 finds that the tourism industry of Bangladesh stays behind than the neighboring countries and stresses on the adoption of strategies generated from both primary and secondary data sources. For observing climate change impacts, the chapter analyses thermal images, temperature data and climatic data of top tourist destinations of Bangladesh as collected from the Bangladesh Meteorological Department. The chapter presents the same evidence that climate change is the causing temperature rise, uneven precipitation rate, beach erosion and salinity intrusion in the country. The chapter suggest adaptation measures after the identification of likely impacts of climate change on tourism and supports further research for developing the tourism industry of Bangladesh in sustainable manner for combating the climate change adversity.

Chapter 19 sightsees that the number of technology relied tourists is rising and the trend of developing tourist-friendly technology-based applications becomes dominant. Also, findings of this research identify a sharp challenge to fulfill the expected tourist experience level. The chapter finds an uneven situation in both availability and the application of innovative tourism and hospitality technologies. Also, the chapter spots a gap between tourist the expectations and the experiences they receive. As a result, the research recommends the formulation of effective strategies and their implementation in the Bangladesh tourism and hospitality industry for the betterment of tourist experiences from applying innovative technologies.

Chapter 20 finds that technologies have brought a kind of revolution in areas like digital media, treatment, tourism, communication, scientific innovation, artificial intelligence, new gadgets etc. More reliance of the tourism and hospitality industry on technology actually creates more opportunities for service providers. The interactive features of technological advancements make tourists to get access to relevant data and information through the Internet. These data and information also support them for deciding their trips. In Bangladesh, tourists can be supported by technology.

On the basis of literature review, Chap. 21 develops a framework that explains how technology application can lead to socio-economic development in a country like Bangladesh. As well as, the chapter considers the inestimable features of the data and their attachments to socio-economic progress. With such consideration, the chapter applies accessible secondary sources for offering comprehensive ideas about the effects of technology implementations in the tourism industry for socio-economic development in Bangladesh. On the basis of findings, the chapter discusses implications that aim the upliftment of the tourism industry for the socio-economic development in Bangladesh.

This in-depth interview relied Chap. 22 finds a number of challenges in the area as: first, the unwillingness and support from top management; second, inadequate governmental support; third, poor service quality of the Internet Service Providers (ISP)/with poor speed of the Internet; fourth, high installation cost; fifth, high hardware and software cost; sixth, high maintenance cost; and lack of technical knowledge both of the employees and clients. This chapter also makes recommendations on the basis of principles of successful tourism and hospitality business operations supported by IT application. This research can help industry practitioners and policymakers to formulate policies and business strategies. The research can contribute for improving the existing situation of IT application in this industry in Bangladesh.

Any industry can be continually disrupted by both negativities and unexpected consequences. The tourism industry cannot be an exception to this. In the most recent time, the tourism industry has witnessed several drawbacks and crisis like COVID-19. Contents of this book has partially been able to bring out the diversities and depth of some contemporary issues like COVID-19. This is rather a limitation of this book. However, on the ground of findings of this book, a comprehensive research on possibilities, opportunities, drawbacks and crisis can possibly be carried out as a further research endeavour.