Chapter 6
Technological Innovations Application in the Tourism Industry of Bangladesh

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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 economies 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 advancements. 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 evolving 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 innovative 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" company'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.
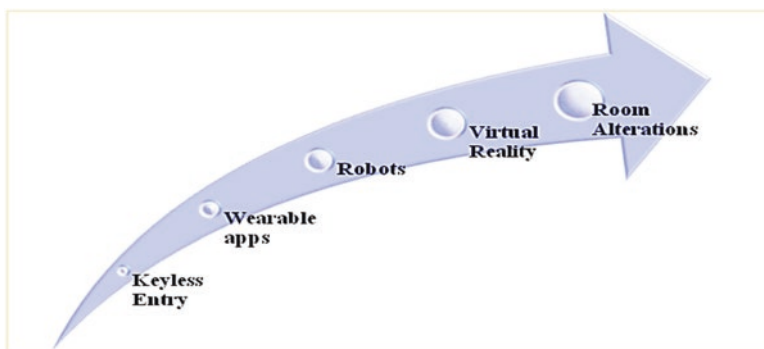

Fig. 6.1 Evolution of new technologies in hotels since 2014. (Source: Adapted from Euromonitor, 2019)

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.

References

Bhuyan, M., & Rahman, S. (2014). Social media as a tool of brand communication in Bangladesh: Problems and prospects. *DIU Journal of Humanities and Social Science, 2*, 61–76.

Bilgihan, A., Okumus, F., "Khal" Nusair, K., & Joon-Wuk Kwun, D. (2011). Information technology applications and competitive advantage in hotel companies. *Journal of Hospitality and Tourism Technology, 2*(2), 139–153.

Boztas, S. (2017). *Automated holidays: How AI is affecting the travel industry*. Retrieved from: www.theguardian.com/sustainable-business/2017/feb/17/holidays-travel-automated-lastminuteexpedia-skyscanner. Accessed 10 Dec 2019.

Buhalis, D. (2019). Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review*, *ahead-of-print* (ahead-of-print).

Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S., & Hofacker, C. (2019). Technological disruptions in services: Lessons from tourism and hospitality. *Journal of Service Management, 30*(4), 484–506.

Euromonitor. (2019). *Hotels and technology: Taking stock and looking ahead 2015*. Retrieved from: http://www.fastmr.com/prod/1098814_hotels_technology_taking.aspx?afid=302. Accessed 10 Dec 2019.

Frey, C. B., & Osborne, M. A. (2013). *The future of employment: How susceptible are jobs to computerisation?* University of Oxford Press.

Gjerding, K. (2017). *How Blockchain technology will dominate the travel sector*. Retrieved from: www.forbes.com/sites/forbesfinancecouncil/2017/03/28/how-blockchain-technology-will-dominate-the-travel-sector/#4f16b4d99de5. Accessed 10 Dec 2019.

Gubbi, J., Buyya, R., Marusic, S., & Palaniswami, M. (2013). Internet of things (IoT). *Future Generation Computer Systems, 29*, 1645–1660.

Hassan, A., & Rahimi, R. (2016). Consuming 'Innovation': Augmented reality as an innovation tool in digital tourism marketing. In P. Nikolaos & I. Bregoli (Eds.), *Global dynamics in travel, tourism, and hospitality* (pp. 130–147). IGI Global.

Hjalager, A. (2013). 100 Innovations that transformed tourism. *Journal of Travel Research, 54*(1), 3–21.

Howlader, M. (2018). *Digital technology powers tourism industry*. Retrieved from: https://the-financialexpress.com.bd/views/digital-technology-powers-tourism-industry-1537805524. Accessed 10 Dec 2019.

Hughes, K., & Moscardo, G. (2019). ICT and the future of tourist management. *Journal of Tourism Futures, 5*(3), 228–240.

Jung, T., Chung, N., & Leue, M. (2015). The determinants of recommendations to use augmented reality technologies: The case of a Korean theme park. *Tourism Management, 49*, 75–86.

Kazandzhieva, V., Ilieva, G., & Filipova, H. (2018). *Traditions and innovations in contemporary tourism* (p. 204). Cambridge Scholars Publishing.

Khan, M. Y. H., & Hossain, A. (2018). The effect of ICT application on the tourism and hospitality industries in London. *SocioEconomic Challenges, 4*(2), 60–68.

Khatri, I. (2019). Information technology in tourism & hospitality industry: A review of ten years' publications. *Journal of Tourism and Hospitality Education, 9*, 74–87.

Kikuchi, D. (2017). *"Strange" hotel, run by robots, opens near Tokyo; more to come*. Retrieved from: https://www.japantimes.co.jp/news/2017/03/15/business/strange-hotel-run-by-robots-opens-near-tokyo-more-to-come/#.Xj-a5M77Rdg. Accessed 10 Dec 2019.

Lo, I., McKercher, B., Lo, A., Cheung, C., & Law, R. (2011). Tourism and online photography. *Tourism Management, 32*(4), 725–731.

Manyika, J., Chiu, M., Bughin, J., Dobbs, R., Bisson, P., & Marrs, A. (2013). *Disruptive technologies*. McKinsey Global Institute.

Mihajlović, I., & Strugar, I. (2015). *Revisiting the impact of ICT to the tourism development.* Retrieved from: file:///C:/Users/USER/Downloads/SSRN-id3282246.pdf. Accessed 10 Dec 2019.

Ministry of Science and Information & Communication Technology. (2019). *National Information and Communication Technology (ICT) Policy-2002*. Retrieved from: http://www.btrc.gov.bd/sites/default/files/ict_policy_2002_0.pdf. Accessed 10 Dec 2019.

Moniruzzaman, M., & Abedin, M. (2015). *Tourism promotional dimension on Bangladesh prospective*. Retrieved from: https://globaljournals.org/GJMBR_Volume15/2-Tourism-Promotional.pdf. Accessed 10 Dec 2019.

Munford, M. (2016). *How technology will change travel in 2016.* Retrieved from: https://www.telegraph.co.uk/travel/advice/how-technology-is-changing-travel/. Accessed 10 Dec 2019.

Murphy, H., Chen, M., & Cossutta, M. (2016). An investigation of multiple devices and information sources used in the hotel booking process. *Tourism Management, 52*, 44–51.

Ndesaulwa, A. P., & Kikula, J. (2016). The impact of technology and innovation (Technovation) in developing countries: A review of empirical evidence. *Journal of Business and Management Sciences, 4*(1), 7–11.

Omerzel, D. (2015). Innovativeness in tourism: Model development. *Procedia Economics and Finance, 23*, 750–756.

Organisation for Economic Co-operation and Development (OECD). (2018). *OECD tourism trends and policies 2018*. OECD Publishing.

Pechlaner, H., & Innerhofer, E. (2016). *Competence-based innovation in hospitality and tourism*. Routledge.

Planning Commission. (2015). *Seventh Five Year Plan Fy2016 – Fy2020*. Retrieved from: https://www.undp.org/content/dam/bangladesh/docs/Projects/IBFCR/national/7th%20Five%20Year%20Plan(Final%20Draft).pdf. Accessed 10 Dec 2019.

Rejeb, A., & Rejeb, K. (2019). Blockchain technology in tourism: Applications and possibilities. *World Scientific News- An International Scientific Journal, 137*, 119–144.

Rodríguez, B., Molina, J., Pérez, F., & Caballero, R. (2012). Interactive design of personalised tourism routes. *Tourism Management, 33*(4), 926–940.

Song, H., & Liu, H. (2017). Predicting tourist demand using big data. In Z. Xiang & D. Fesenmaier (Eds.), *Analytics in smart tourism design: Tourism on the verge* (pp. 13–29). Springer.

Sultana, S. (2016). Economic contribution of tourism industry in Bangladesh. *Journal of Tourism, Hospitality and Sports, 22*, 45–54.

The Daily Star. (2019). *Facing the challenges of technological revolution*. Retrieved from: https://www.thedailystar.net/editorial/news/facing-the-challenges-technological-revolution-178214e8. Accessed 10 Dec 2019.

Townsend, P. (2017). *The dark side of technology*. Oxford University Press.

Travel & Tourism Council. (2019). *Travel & tourism: Global economic impact & trends 2019*. Retrieved from: http://ambassade-ethiopie.fr/onewebmedia/Tourism-WTTC-Global-Economic-Impact-Trends-2019.pdf. Accessed 10 Dec 2019.

TripAdvisor. (2014). *TripAdvisor now offers 150 million reviews and opinions with 50 million pieces of content posted in the past year*. Retrieved from: http://www.tripadvisor.com/PressCenteri6611-c1-Press_Releases.html. Accessed 10 Dec 2019.

Tussyadiah, I., & Zach, F. (2015). *Hotels vs. peer-to-peer accommodation rentals: Text analytics of consumer reviews in Portland, Oregon*. Retrieved from: SSRN: https://ssrn.com/abstract=2594985 or https://doi.org/10.2139/ssrn.2594985. Accessed 10 Dec 2019.

World Bank. (2018). *World Bank event 2018*. https://www.worldbank.org/en/events/2018/09/26/digital-platforms-and-sustainable-tourism#1. Accessed 10 Dec 2019.

World Economic Forum. (2019). *The travel & tourism competitiveness report 2019*. Retrieved from: http://www3.weforum.org/docs/WEF_TTCR_2019.pdf. Accessed 10 Dec 2019.

World Tourism Organization. (2011). *Tourism towards 2030*. Retrieved from: https://www.e-unwto.org/doi/pdf/10.18111/9789284414024. Accessed 10 Dec 2019.

World Tourism Organization. (2014). *AM Reports, Volume nine – Global report on adventure tourism*. UNWTO.

Xu, M., David, J., & Kim, S. (2018). The fourth industrial revolution: Opportunities and challenges. *International Journal of Financial Research, 9*(2), 90–95.