

# Chapter 4

## Technological Innovation Application in the Tourism and Hospitality Industry of Bangladesh



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**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 pre-book 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.

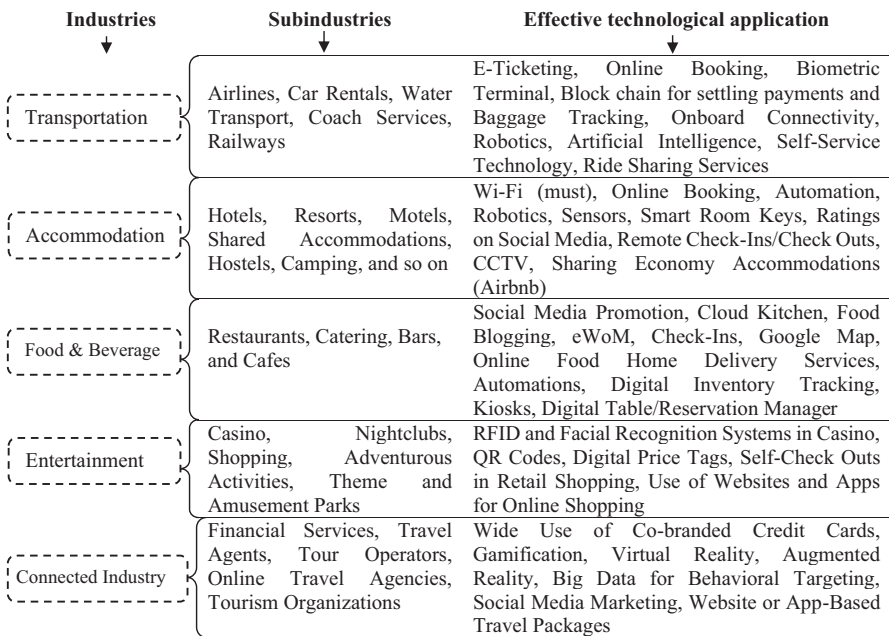
To fulfil the aforementioned objectives, several reputed journals, such as “Tourism Management”, “Journal of Travel Research”, “Tourism Review”, “Information Technology in Tourism”, “Information and Communication Technology in Tourism”, and so on, were reviewed from June 03 to July 03 to obtain insights 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).



**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](https://www.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](http://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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