

## ABCD technology integration in the hospitality industry of Bangladesh: An analysis of web content

Nehad Laila Sanju<sup>1</sup>

### ABSTRACT

The Hospitality sector is undergoing a vital transformation as digital technologies take center stage, with data-driven applications playing a key role in shaping its future. This global sector is witnessing a remarkable evolution, driven by technological advancements, where cutting-edge services are now a necessity for sophisticated travellers. This study explores how data-driven technologies like artificial intelligence, blockchain, cloud computing, and data analytics are being used in the hospitality industry, which relies heavily on information. Additionally, Bangladesh, known for its natural beauty and tourism potential, is falling behind in adopting these digital tools for several reasons. While some tourism organizations are starting to use digital solutions, progress is still limited. This exploratory research from Bangladesh seeks to shed light on the existing landscape and motivate industry professionals to improve their online visibility and offerings. To achieve this goal, the study utilizes web content analysis through the ABCD technology model and investigates the trends of digital adaptation within the Bangladeshi hotel sector.

**KEYWORDS:** Artificial Intelligence, Blockchain, Cloud computing, Data analytics, Hospitality, ABCD Technology, Web Content Analysis.

<sup>1</sup> Department of Management Information Systems, Faculty of Business Studies, University of Dhaka, Dhaka- 1000, Bangladesh.  
(CORRESPONDING AUTHOR) ✉ [nehadlailasanju@du.ac.bd](mailto:nehadlailasanju@du.ac.bd)

**ARTICLE HISTORY:** *Received:* 30 Oct 2024; *Revised:* 21 December 2024; *Accepted:* 28 Dec 2024; *Published:* 30 June 2025

---

## 1. Introduction

The rise of information technology and online activities has transformed industries, particularly hospitality and tourism. Research indicates that technology influences organizational growth in several ways, including development (Zikria et al., 2019; Saleem et al., 2020), innovation (Ali et al., 2023; Jorgenson et al., 2016), operational performance (Pérez-López et al., 2019), and competitiveness (Ollo-Lopez et al., 2012). Additionally, it impacts job creation (Steinfeld et al., 2012) and sales activities (Díaz et al., 2015), while also shaping enterprise information systems (El Kadiri et al., 2016). The shift to digital technology presents numerous opportunities for the hospitality sector, significantly enhancing hotel performance in areas like reservation management, room management, communication, and guest billing. Consequently, ICT has become a vital strategic asset, prompting hotels to invest heavily in these technologies.

As a result, hotels increasingly rely on technology to enhance operations, improve management, boost revenue, and increase guest satisfaction (Chavan et al., 2024; Hjalager, 2010). Research categorizes technological innovations in the hotel sector into three groups based on source, integration level, and supplier control (Seggitur, 2014; Jaremen, 2016; Kazandzhieva & Santana, 2019). Most organizations follow implementation strategies from their suppliers (Orfila-Sintes et al., 2005; Pivčević & Garbin, 2012). Hence, key advancements focus on mobile tech, IoT, cloud computing, big data, smart devices, social media, and sensors, which are vital for smart tourism (Evans & Peacock, 2000; Irvine & Anderson, 2008; Zapalska et al., 2015; Praničević & Mandić, 2020). In the hospitality sector, trends like User Generated Content (UGC), feedback systems, social media, global positioning services, Blockchain payments, and AI technologies are reshaping guest and host expectations and behaviors. Visitors now demand smarter, more efficient services, prompting the industry to rethink service delivery. While digital technology is crucial for enhancing hospitality services, Bangladesh faces challenges in adopting ICT due to an underdeveloped workforce, economic issues, and limited tech skills (Sardar, 2019).

Over the past thirty years, Bangladesh's travel and hospitality industry has significantly expanded (Sardar et al., 2020). In 2019, tourism created 1.86 million jobs (2.9% of total employment) and contributed 3% to GDP (WTTC, 2020b). The country earned \$0.4 billion from about one million international tourists (SESRIC, 2020). A WTTC report (2020a) noted a 96% increase in domestic tourism spending and an 88% rise in leisure spending in 2019. Foreign visitors grew from 16,000 to 106,000, while domestic tourists reached 35 million in 2017. Travelers seek various accommodations and expect advanced information and communication technologies (ICT), prompting the hospitality sector to adopt these technologies. To remain competitive, businesses are focusing on current customer preferences, supported by an ICT policy established in 2009 (BTRC, July 2009). Likewise, the ICT industry in Bangladesh is rapidly growing, prompting businesses to enhance their ICT capabilities, supported by government policies (Khan, 2020). The Bangladesh Computer Council (BCC) collaborates with the Ministry of Science and ICT to promote various initiatives (Dettoni, 2020). This presents a significant opportunity for the travel and hospitality sector to adopt new technologies and improve services. The hospitality industry should leverage technology, such as social media, to connect with customers, as modern technology plays a crucial role in tourism. The hotel industry is adapting its operations to meet the needs of tech-savvy tourists, driving the entire tourism ecosystem (Rahman & Hassan, 2021).

The hotel sector in Bangladesh is increasingly adopting technology to enhance communication among operators, suppliers, service providers, and customers. Key areas of focus include improving technical resources, internet services, ICT regulations, employee training, and inter-sector collaboration (Mowla,

---

2019). Mobile technology has connected travelers with hoteliers, enriching the tourist experience through online searches for activities, accommodations, and services (Fatima et al., 2019; Ho et al., 2012). Tourists often rely on apps and platforms like Google Maps and hotel booking websites (Pejic et al., 2009; Sheppard & Cizek, 2009; Mathayomchan & Sripanidkulchai, 2019), prompting hoteliers to stay informed about digital solutions. However, Rahman and Hassan (2021) highlight that many tourists also use social media and online travel agencies during their trips. Despite some studies on digital technology in hotel management, the hospitality sector in Bangladesh remains in the early stages of digitalization (Mowla, 2019; Fatima et al., 2019). This study aims to explore digitalization trends in Bangladesh's hotel industry based on ABCD technology as it resembles the four key foundational technologies in the era of the Fourth Industrial Revolution i.e. artificial intelligence, blockchain, cloud computing, and data analytics. Hence, the key research objective of this study is like to explore in what extant hotels in Bangladesh adapt ABCD technologies. In particular, the key research question is like:

**RQ:** What is the pattern of ABCD technology adoption in Bangladeshi Hotels?

## 2. Literature review

### 2.1 Digitalization of hotel industry

The integration of hotel information systems has greatly impacted various departments, such as reservations, accounting, sales, front desk, marketing, and housekeeping, improving overall hotel performance (Huang et al., 2023; Leung & Law, 2012). These digital innovations enable advanced services for guests, including virtual and augmented reality technologies for remote hotel exploration (Guttentag, 2010) and voice control systems that allow guests to manage room environments (Cobanoglu et al., 2011). Additionally, Internet of Things (IoT) technologies enhance guest experiences, enabling mobile check-ins and room access (Roblek et al., 2016; Ali Köseoglu et al., 2016).

Technological innovation greatly impacts customer relations in the hospitality industry. Online platforms and social media enhance information exchange and encourage guest participation in co-creating hotel services. Smart devices, such as smartphones and apps, facilitate user-generated content, allowing guests to share experiences through reviews and blogs (Sanju, 2023, 2024; Akehurst, 2008; Buhalis & Foerste, 2015; Del Vecchio et al., 2018). This feedback helps hotels improve their services (Kärle & Fensel, 2015; Ozturk et al., 2016). Intelligent applications streamline tasks like booking, check-in, and communication with staff, while smart card access enhances service security and efficiency (Najafipour et al., 2019). Chatbots and robots engage potential guests, improving operations and revenue. Chatbots provide quick responses to inquiries and service orders, while AI-driven robots act as concierges, offering information on dining, events, and amenities (Lasek, 2013; Radde, 2017; Ohlan, 2018).

Hotels are increasingly improving their financial performance through information and communication technology (ICT), such as cloud-based processing and blockchain systems, which require minimal infrastructure investment (Chen et al., 2012). Technologies like chatbots and mobile apps enhance financial management, while property management systems efficiently oversee

---

operations and resource management (Bader, 2005; Priyadarsini et al., 2009; Jaremen et al., 2016). The Internet of Things (IoT) also helps hoteliers analyze occupancy rates, reducing costs without sacrificing guest comfort. Mihalič and Buhalis (2013) highlight that ICT innovations indirectly benefit small hotels' financial performance over time by enhancing market differentiation and brand image, helping them remain competitive.

### **2.1.1 Digitalization in Bangladeshi hotel industry**

Digitalization is crucial for achieving sustainable growth, and although Bangladesh has not yet fully embraced this transformation, rapid advancements are positively impacting various sectors by enhancing profitability and expansion. The tourism industry stands out as a vital component of Bangladesh's economy, mirroring its importance on a global scale (Sardar et al., 2021). The increasing interest in a variety of travel destinations has led authorities to create new tourism sites catering to different market segments. In this evolving landscape, Information Technology (IT) serves as a pivotal force, bridging gaps between boundaries, sectors, and cultures. For instance, Mowla (2019) utilizes secondary data to investigate how IT can elevate tourism and draw more visitors, ultimately contributing to Bangladesh's GDP. The integration of web technologies streamlines communication and service delivery within the travel sector, facilitating inquiries, reservations, and bookings. Given that tourism is one of the fastest-growing industries worldwide, digital adaptation is vital for developing nations like Bangladesh to effectively promote their tourism offerings. In this regard, Ali et al. (2022) discovered that factors such as performance expectancy, hedonic motivation, and habitual behavior significantly shape tourists' intentions to engage with information and communication technology (ICT). Ultimately, the actual use of ICT is primarily influenced by tourists' behavioral intentions and established habits, along with the presence of supportive conditions. Additionally, Sarkar and Dash (2024) explore how digital technologies are advancing tourism in Bangladesh, particularly through online travel platforms, social media, and blogs. Their findings indicate that IT greatly improves customer service, communication, destination marketing, and sustainable tourism, resulting in enhanced customer satisfaction and loyalty. Moreover, it fosters awareness of local cultures and popular mobile applications for travel bookings. The study also emphasizes that investing in IT infrastructure, upgrading systems, and training staff are critical for tourism businesses to fully realize their potential.

### **2.2 ABCD technologies for hotel industry**

Digital business transformation strategies drive innovative work and customer interaction, essential for developing new business models. This transformation improves operations in the hospitality sector by enhancing customer service, payment systems, and online engagement, shifting from traditional brick-and-mortar to a click-and-brick model while integrating technology across all functions. Organizations can utilize four key technologies—artificial intelligence, blockchain, cloud computing, and data analytics—to digitize services. The goal is to transform businesses into leaders of the digital economy. Companies like Uber, Facebook, and Airbnb exemplify this shift, operating successfully without traditional asset ownership, reducing the need for inventory and associated costs.

### 2.2.1 Artificial Intelligence

AI (Artificial Intelligence) solutions can perform human tasks faster and more accurately in transaction processing (Nam et al., 2021). These systems exhibit cognitive abilities similar to humans (Chen, 2024; McGettigan, 2016) and leverage advanced computing technologies for complex decision-making (Tredinnick, 2017). Many leading hotels have integrated AI and robotics into their operations, from back-office tasks to client interactions (Sanju, 2024; Epiknetworks, 2018). As the hospitality sector recognizes the advantages of these technologies, more establishments are likely to adopt them. AI and robotics are essential for achieving goals related to smart tourism and smart hotels. Buhalis (2020) suggests that various technologies, including AI, autonomous vehicles, and the Internet of Things, will significantly impact the tourism sector, including hotels, over the next 75 years.

This technology-driven ecosystem enables service providers and tourists to collaboratively create new value-added services (Buhalis et al., 2019). Leading hotels worldwide are implementing various AI and robotic technologies to improve operational efficiency (Francis, 2019; Haaser et al., 2018). Examples include chatbot-driven voice recognition, facial recognition, delivery robots, and data analytics. For instance, GuestU and SnapTravel utilize Facebook Messenger for monitoring messages and inquiries, while Booking.com has launched a smart chat feature (Kazak et al., 2020). Popular in-room technologies include voice recognition and chatbots, with customers favoring systems that control temperature, lighting, and window treatments (Hasser et al., 2018). Additionally, delivery and concierge robots (Murphy et al., 2017) help to reduce costs and enhance customer experience.

### 2.2.2 Blockchain

Advancements in technology and digitization in tourism have led to customer-centric value propositions emphasizing transparency, customization, and decentralized value chains (Bodkhe et al., 2019). Kwok and Koh (2018) highlight blockchain's potential to transform the hospitality industry by providing a secure, transparent platform for transactions. It also offers major advantages for hospitality management, especially in terms of security and reliability. It keeps data in a decentralized and traceable way, which helps guard against cyber threats and maintains the integrity of financial transactions. This technology also streamlines complicated payment processes, particularly for international transactions, making them more efficient and clear, which fosters trust among all parties involved. Additionally, blockchain improves the sharing of information and data storage among travel companies, encouraging teamwork and enhancing the overall travel experience for customers. This technology allows users to book flights, hotels, and dining through a single blockchain application using one cryptocurrency (Bodkhe et al., 2019). While earlier systems focused on customer interaction and data processing, modern blockchain applications now cover booking and facilities management (Pilkington, 2017; Willie, 2019). These applications span various areas, including Inventory Management, Maintenance and Tracking, Content Management, and Reservations. For instance, blockchain can share inventory and pricing among stakeholders (Bell and Hollander, 2018; HTNG, 2018; Willie, 2019). Additionally, it is crucial for maintenance and tracking in supply chain management and for updating content during hotel renovations or rebranding.

### 2.2.3 Cloud Computing

Cloud technologies are transforming enterprises by lowering infrastructure costs, promoting innovation, and driving digital transformation (Lemley et al., 2017) while Bo (2018) noted that these technologies enhance business agility through improved system efficiency. Cloud technology is not just an architecture or tool; it is a method of resource sharing via computing. Senyo et al. (2016, 2018) define cloud computing as delivering IT infrastructure and applications as services over the Internet, categorized into three main types: (1) Infrastructure as a Service (IaaS), like Amazon Elastic Computing Cloud; (2) Platform as a Service (PaaS), such as Google AppEngine; and (3) Software as a Service (SaaS), including platforms like Salesforce CRM (Akter et al., 2020). In the hospitality sector, cloud technology is particularly impactful, enabling hotel management systems (PMS) to be accessed online rather than through desktop installations (Cecowski et al., 2017). This shift allows information systems to be utilized like essential utilities (Carr, 2008) and offers technical, economic, and environmental benefits. By adopting cloud solutions, hotels can implement new technologies and marketing strategies, including social media, channel management, and online booking systems.

Cloud computing extends the life cycle of hospitality systems by offering innovative, cost-effective solutions, providing a strategic advantage (Hopkins, 2011). A key change is the centralization of reservations and electronic distribution. For example, the Louvre Hotel Group's use of the OPERA property management system eliminated the need for physical maintenance and outsourced data storage (MICROS Systems Inc., 2013). Cloud computing also enhances uptime, flexibility, and security, allowing hoteliers to focus on core operations (Vella et al., 2018). It has become a scalable distributed framework that promotes service orientation and standardization via the internet (Wang et al., 2020; Xia et al., 2020; Sharma et al., 2015). This configurable platform provides on-demand access to shared computing resources with minimal management (Almorsy et al., 2016). Users can adjust their cloud usage based on needs, leading to reduced global business expenses (Sabi et al., 2016; Akter et al., 2020).

### 2.2.4 Data analytics

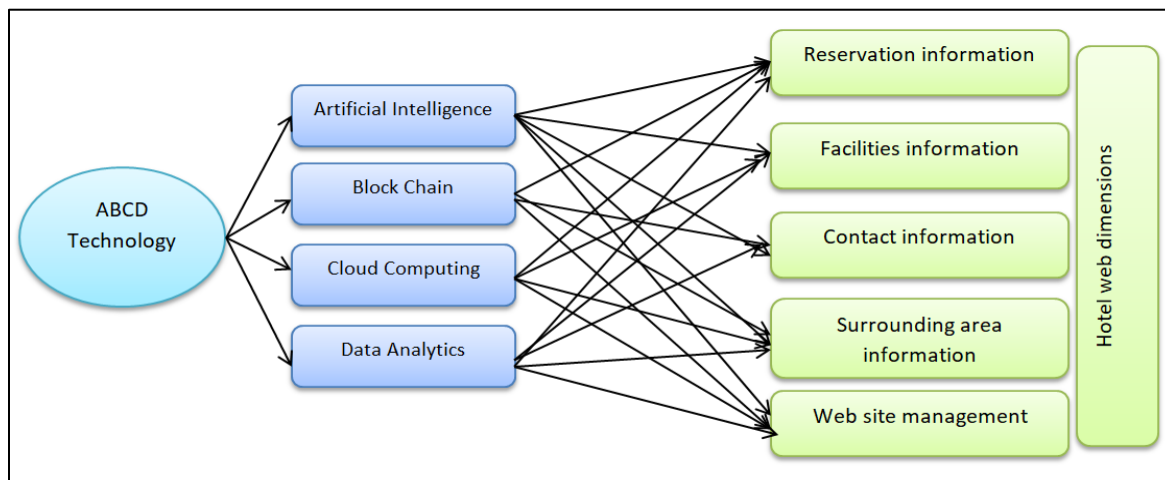
Data analytics has become a transformative strategy in recent years, driven by the rise of big data. This comprehensive process involves collecting, analyzing, and interpreting data to generate actionable insights and business value, helping organizations gain a competitive edge (Akter & Wamba, 2016). Advances in data management have made big data essential for business analytics (Sakib et al., 2024; Wamba et al., 2015). Both traditional and big data analytics aim to uncover competitive advantages from diverse data sources (Battisti et al., 2019; Camilleri, 2019; Shams & Solima, 2019). In the hospitality management sector, which includes hotels, restaurants, and tourism, analytics is vital for transforming large data sets into actionable intelligence across various functions like sales and marketing. Technologies such as Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), and E-commerce illustrate the application of data analytics (Nyabuti, 2018; Tong-On et al., 2021). Key drivers—automation, consumer engagement, and monetization—allow the hospitality industry to leverage data analytics for improved cost efficiency, decision-making, and new opportunities (Davenport, 2014; Manyika et al., 2011). Additionally, data analytics helps the hotel industry evolve into an information-driven sector,

enhancing innovation, productivity, and market entry through data-centric strategies (Gobble, 2013; Davenport, 2014; Chen et al., 2012).

Successful data analytics implementation in hotels depends on the right technologies and aligning expertise with Big Data Analysis demands. Assessing the technological landscape is crucial for daily operations. Users may struggle to adopt new technologies if introduced after integration, but there is encouragement to embrace them for competitive advantage. As users become more knowledgeable, their understanding and application of big data analytics improve (Tong-On et al., 2021).

### 2.3 Theoretical Framework

Organizational resources are divided into assets and capabilities, including both tangible and intangible elements (Umrani, 2016). Information and Communication Technology (ICT) is a crucial resource that enhances the management and development of the hospitality workforce and improves service capabilities (Harif et al., 2022). By integrating ICT, organizations can enhance their competencies and assets, leading to service innovations and improved performance. The resource-based view (RBV) emphasizes the importance of internal resources in shaping strategies (Wernerfelt, 1984), while the technology acceptance model (TAM) focuses on technology usage. Studies show that implementing Artificial Intelligence, Blockchain, Cloud Computing, and Data Analytics enhances business resources and promotes digital innovation adoption (Rodríguez-Espíndola et al., 2022). Together, these technologies form ABCD technology (Akter et al., 2020; Yang et al., 2022), leading to better resource utilization and improved service quality and marketing strategies in the hotel industry.



**Figure 1 Theoretical Framework of the study**

The hospitality industry faces on-going challenges, such as rising technology costs and increasing customer service expectations. Its sustainability depends on financial performance, adaptability, and the ability to innovate and expand services (Van, 2016; Tong-On et al., 2021). ABCD technology can offer a competitive advantage through data-driven decision-making, real-time processing,

technology sharing, and performance management. This study explores the implementation of ABCD technology in Bangladeshi hotels using web-based content. Hotel websites are designed to provide information and facilitate processes tailored to customer needs. Morrison et al. (1999) suggested evaluating hotel websites based on technical, marketing, internal, and customer dimensions, while Law and Leung (2000) emphasized the importance of online reservation services. Liu and Zhang (2014) identified factors influencing online bookings, and LE and Bui (2022) stressed the need for user-friendly websites that offer pricing and facility information. Following Law and Hsu's (2005) framework, this study integrates five key dimensions of hotel websites: reservation information, facilities information, contact information, surrounding area information, and website management. Thus, the theoretical framework has been illustrated in figure 1. Here, to identify the application of each component of ABCD technology in hotels of Bangladesh, digital applications among the web site dimensions have been figured out from literature and compared with Bangladeshi hotels using their web contents.

### 3. Methodology

This study serves as an exploratory study that draws upon existing literature, as outlined in the literature review sections, to examine the integration of digital technology within the hospitality industry of Bangladesh. Utilizing the ABCD technology model, the identified applications are categorized based on the dimensions of hotel websites. Table 1 illustrates a compilation of web-based hotel activities organized according to the ABCD technology components: artificial intelligence, blockchain, cloud computing, and data analytics. By analyzing the prevalence of these specific activities in Bangladeshi hotels, insights into the state of digitalization in the country's hospitality sector are provided. The analysis considers the presence or absence of activities based on the web content of the respective organizations.

**Table 1 List of Hotel Activities That Adopt ABCD Technology Applications**

ICT Application	Hotel Activity	References
Artificial intelligence	Online in-Person Customer Service	Murphy, Gretzel, & Hofacker, 2017; Lin, Chi and Gursoy, 2020; Kazak, Chetyrbok and Oleinikov, 2020
	Virtual Reality & Augmented reality	(Ivanov <i>et al.</i> , 2017; Lin, Chi and Gursoy, 2020)
	Chatbots and Messaging	Lu, Cai, & Gursoy, 2019; Akter <i>et al.</i> , 2021
	Advertising and guiding tour	Angulo, Pfeiffer, Tellez, & Alenya, 2015; (Tussyadiah & Park, 2018; Lin, Chi and Gursoy, 2020)
	Data analysis and updates	Gursoy, Chi, Lu, & Nunkoo, 2019; Lin, Chi and Gursoy, 2020)
Block chain	Security payment system	Treiblmaier, (2019); Filimonau and Naumova, (2020)
	Real-time presences	Shermin, (2017); Filimonau and Naumova, (2020); Prybila <i>et al.</i> , (2017)

ICT Application	Hotel Activity	References
	Fraud prevention and privacy	Treiblmaier, (2019); Filimonau and Naumova, (2020)
	Lockchain	Pilkington, (2017); Willie, (2019); Treiblmaier, (2020)
	ID and Security	Fisher, (2019); Filimonau and Naumova, (2020)
Cloud	Online real time reservation	(Senyo, Effah and Addae (2016) and Senyo, Addae and Boateng (2018), Kazak, Chetyrbok and Oleinikov, (2020)
	PAAS Application	(Akter <i>et al.</i> , 2021; Yurtsever, 2019; Yurtlu, 2020)
	SAAS Application	Almorsy, Grundy, & Müller, (2016); Akter <i>et al.</i> , (2020)
	Recourse sharing	Vella <i>et al.</i> , (2018); Yurtsever, (2019); Yurtlu, (2020)
	IAAS Application	(Nadda, Chaudhary & Arnott, 2020; Akter <i>et al.</i> , 2020; Yurtlu, 2020),
Data Analytics	Reservation and availability summary	Davenport, 2014; Chen <i>et al.</i> 2012; Akter <i>et al.</i> , 2020)
	Price value ratio	(Nyabuti, 2018; Tong-On <i>et al.</i> , 2021)
	Forecasting and advertising	(Gobble, 2013; Davenport, 2014; Chen <i>et al.</i> 2012)
	Activity showcase or additional service directions	(Nyabuti, 2018, Tong-On <i>et al.</i> , 2021)
	Data analysis and directions	(Gobble, 2013; Davenport, 2014; Chen <i>et al.</i> 2012; Akter <i>et al.</i> , 2020)

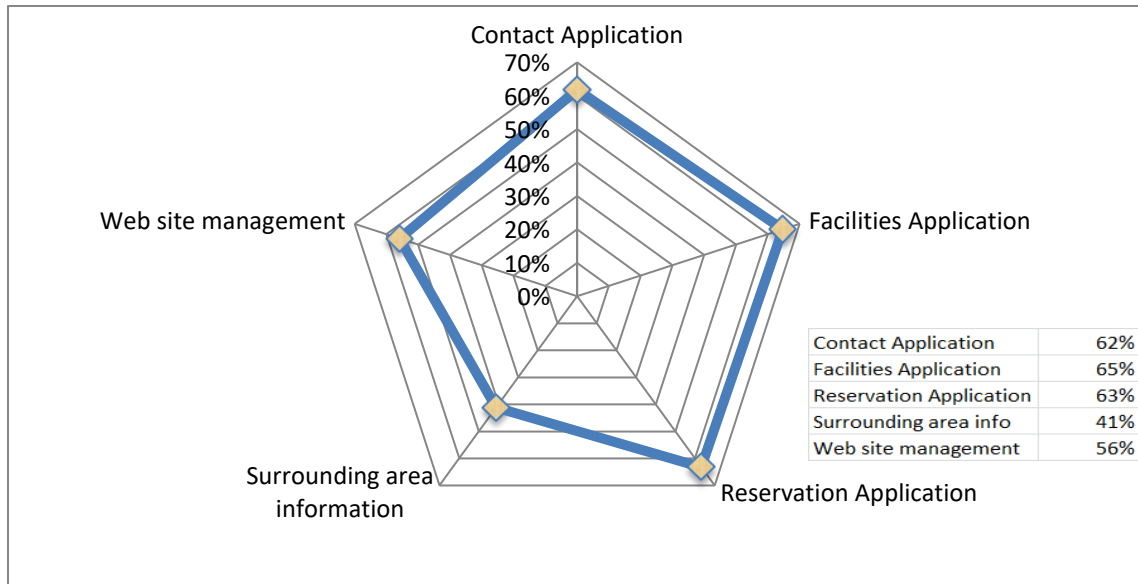
In addition to data collection and design, a random sampling is used to pick the hotels in Bangladesh. Here, Google is used as search engine and to visit the web site for screening the contents along to gather data regarding their online presence. A total of 50 hotels have been chosen to investigate the existence of digitally enabled services illustrated in table 2 and, if present, the extent of their implementation. The analysis is based on five dimensions of hotel websites and their attributes, including reservation information, facilities information, contact details, surrounding area information, and website management. Consequently, the identified ICT-enabled hotel activities are further categorized. The presence of various applications of ABCD technology on hotel websites is documented for subsequent analysis.

**Table 2 List of Hotels used for this study**

No.	Name	Location	No.	Name	Location
1	Dhaka Regency Hotel & Resort Ltd	Dhaka	26	Hotel Asia Pacific	Dhaka
2	Royal Tulip Sea Pearl Beach Resort	Cox's Bazar	27	Hotel City Inn	Khulna
3	Grand Palace Hotel	Rangpur	28	Hotel Royal Inn	Sunamganj
4	Grand River View	Rajshahi	29	Radisson Blu Chittagong Bay View	Chattogram
5	Zabeer Hotel International	Jashore	30	Sairu Resort	Bandarban
6	Chittagong Boat Club	Chattogram	31	Tiger Garden International Hotel	Khulna
7	Grand Sultan Tea Resort & Golf	Moulvibazar	32	Hotel Hasan International	Jashore
8	Grand Mostafa Hotel Aabil	Sylhet	33	Parjatan Motel	Rangpur
9	Hotel Orion International	Jashore	34	Pan Pacific Sonargaon Dhaka	Dhaka
10	Hotel Graver Inn	Patuakhali	35	Hotel Park	Rajbari
11	Hotel Nice International	Rajshahi	36	Hotel Hill Ambassador	Rangamati
12	Sayeman Beach Resort	Cox's Bazar	37	Parjatan Motel	Bogura
13	Hotel Rose View	Sylhet	38	Chittagong Boat Club	Chattogram
14	Hotel North View	Rangpur	39	Hotel Grand Hilsha	Chandpur
15	Bhawal Resort & Spa	Gazipur	40	Oasis Hotel	Cumilla
16	Radisson Blu Dhaka Water Garden	Dhaka	41	Luis Village Resort & Park Ltd.	Jamalpur
17	Mozaffar Garden and Resort	Satkhira	42	INTERCONTINENTAL DHAKA	Dhaka
18	Dera Resort & Spa	Manikganj	43	Hotel Agrabad	Chattogram
19	Hotel Lake Castle	Dhaka	44	Hotel Royal Inn	Sunamganj
20	Long Beach Hotel	Cox's Bazar	45	Hotel Star International	Rajshahi
21	Hotel AMIR International	Mymensingh	46	Hotel Nice International	Mymensingh
22	Sea Pearl Beach Resort & Spa	Cox's Bazar	47	The Peninsula Chittagong	Chattogram
23	Hotel Amari Dhaka	Dhaka	48	Hotel Grand Hilsha	Chandpur
24	The Westin Dhaka	Dhaka	49	Hotel Orion International	Jashore
25	Dusai Resort & Spa	Moulvibazar	50	Hotel Graver Inn	Patuakhali

#### 4. Result and discussion

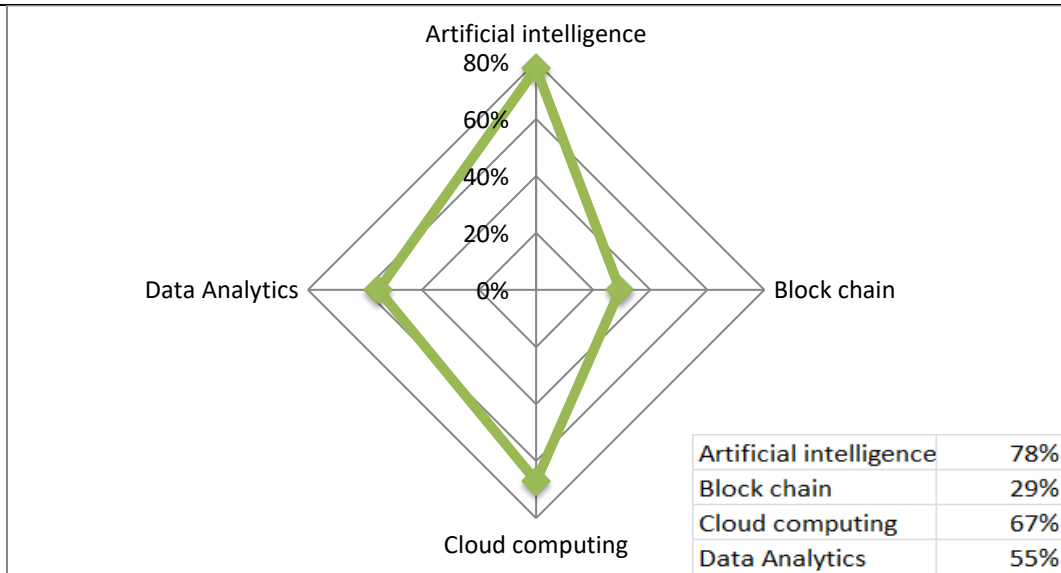
The study is exploratory in nature, yet the critical discussion adopts a descriptive approach. It analyzes web content outlining the amenities and services offered by specific hotels in Bangladesh. The categorization of available ICT applications is based on hotel web dimensions and ABCD technologies.



**Figure 2 Hotel activity wise ABCD adaptations**

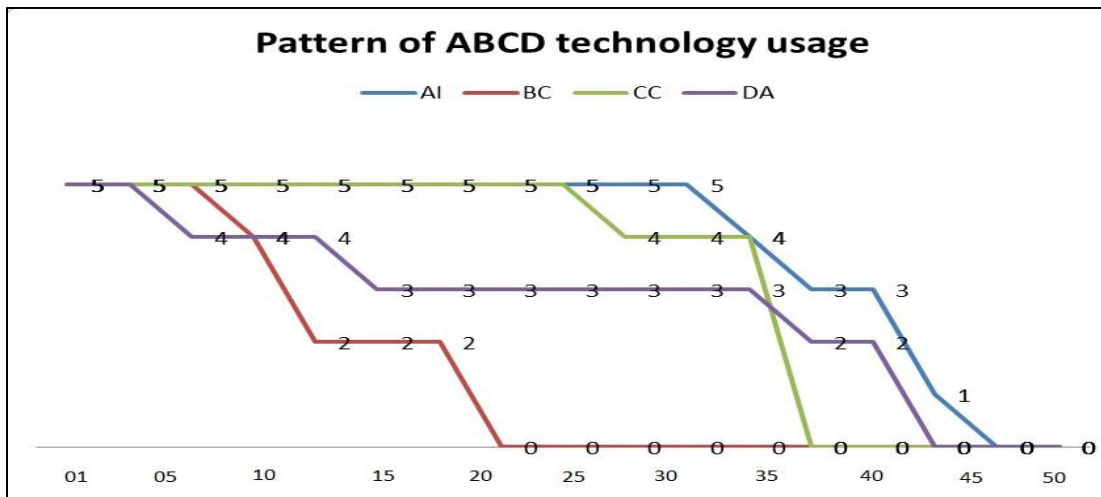
Figure 2 illustrates the percentage of digital innovation adoption across the primary web activity dimensions of Bangladeshi hotels, with the facilities application exhibiting the highest value at 65%. This suggests that ICT is predominantly utilized in Bangladeshi hotels to enhance hospitality-related services for guests during their stay. Digital tools are utilized more frequently for managing reservations and contact information, with values of 63% and 62% for the reservations application and contact application, respectively. This highlights that hotel operations related to reservations, services, and contact directories significantly leverage digital tools in Bangladesh. For instance, Hotel InterContinental, a leading hospitality provider in Bangladesh, manages its room booking system online in conjunction with a customer portfolio through an integrated CRM system.

Similarly, the following figure 3 illustrates the percentage contribution of each component of ABCD technology to the overall operations of hotels. The four corners of the green line in this diagram represent the four components of the ABCD technology model. In Bangladeshi hotels, the adoption of artificial intelligence applications is more widespread than that of blockchain technology. Specifically, the use of artificial intelligence stands at approximately 78%, while cloud computing applications account for 67%. Data analytics and blockchain technologies are utilized at rates of 55% and 29%, respectively. Digital solutions for accommodation bookings, inquiries, and promotional activities are favoured over financial transaction tools, as they are perceived to be more popular and less risky among Bangladeshi hotels. Consequently, the majority of digital applications in hotel operations leverage AI and cloud technologies.



**Figure 3 ABCD technology's implementation**

However, though overall adaptation of ABCD technology model varies from application to application, the implication of AI is mostly used, next the cloud computing and data analytics are used to perform hotel operation and Block chain is least adapted application in Bangladeshi hotels. This pattern is presented through the following line graph in figure 4. Here, the four elements of ABCD technology presented by four different lines in top down order where the bottom line presents of number of hotels. Each line is presents their trends along with scores. For instance: Blue line represents patterns of artificial intelligence (AI) that holds score 5 in thirty five hotels which is highest in the chart, 4 in two of hotels, 3 in eight hotels and 2 and 1 for couples hotel. On the other hand, red line presenting the score for block chain (BC) that holds score 5 in three, 4 in one, 2 in three and 0 in rest of the hotels which represents the lowest value in the chart. Furthermore, cloud computing (CC) and data analytics (DA) hold middle position among the four applications. For example, around 25 hotels use cloud computing in all the cases measured herewith while, around 23 hotels utilise three factors of data analytics. On the other hand blockchain is rarely used application for hotels in Bangladesh.



**Figure 4 Patterns of ABCD technology usage**

In the light of above discussion, hotels of Bangladesh mostly use the applications of artificial intelligence and cloud computing while application of data analytics is in third position and block chain is the least adapted application of ABCD technology. Thus, this section is to measure whether any statistical association exist among the components of ABCD technology that results in high or low adaptation of applications.

**Table 3 Pairwise t-Test and Fisher’s Exact Test**

Pairs	t value	Fisher’s exact
AI & BC	4.8194 ***	0.834
AI& CC	2.0447*	0.002***
AI & DA	4.6424 ***	0.044*
BC & CC	-3.6146***	0.159
BC & DA	-2.9172***	0.073
CC & DA	1.6143	0.184

Table 3 presents the result of pair-wise comparison and association through t-test and Fisher’s exact test of the four elements of the ABCD technology model. Usually, a paired **t**-test is used for utilizing precise and systematic analysis that aids in uncovering the underlying truths in comparative studies, ensuring that observed differences are not due to random chance. This test is predicated on the assumption that the differences between paired observations are normally distributed, a fundamental concept in ensuring test results’ validity. Similarly, Fisher’s exact test is an extension of Pearson’s Chi-squared test that exhaustively checks every variation of each degree of freedom to find the actual probability of the observed contingency table. Here, pair of artificial intelligence (AI) and block chain (BC) has a positive t value with high statistical significance that indicates AI has more significant adaptation then BC on the other hand fisher’s exact test value is insignificant that indicates there is very low chance of having any sort of association among AI and BC. But, both pairs of AI & CC (Cloud computing) and AI & DA (Data analytics) have significant positive **t** values and Fisher’s exact values, which implies there is a strong association among the components and AI has greater adaptation in hospitality organizations.

However, the pairs BC & CC and BC & DA have a negative,, significant t value and an insignificant Fisher’s exact value, which means that cloud computing and data analytics have more adaptation than blockchain, along with a very low probability of having any sort of association. Finally, the last pair is of cloud computing and data analytics, which has a positive but insignificant value, indicating less adaptation of data analytics.

## 5. Implication

This study provides valuable insights into digitalization in hospitality services, particularly in developing countries like Bangladesh. While previous research focused on traditional performance metrics related to ICT in hospitality, this study examines digital business strategies through technological innovations, specifically ABCD technology, and how they are adapted in Bangladeshi hospitality organizations. In theoretical context, it offers a broader framework for understanding ICT adaptation based on web presence, essential for attracting international tourists. Additionally, it explores the connections between the Technology Acceptance Model (TAM) and resource-based views in the context of tourism demand and development, expanding the existing literature on digitalization beyond standard financial and operational measures.

Similarly in practical context, this study outlines key insights for industry professionals in Bangladesh's lodging sector, which employs various digital tools such as websites, electronic booking systems, and self-check-in options. These technologies enhance efficiency, automate processes, and improve guest experiences. The integration of AI, blockchain, cloud computing, and data analytics within the ABCD technology model can address industry challenges. The study serves as a guide for hotel managers, emphasizing the importance of adopting the latest ICT developments for a competitive edge. It also highlights the value of personalized customer interactions through ABCD applications to better meet needs and drive market leadership. Additionally, regular updates to websites can boost marketing efforts, influencing customer behavior and potentially increasing revenue. It also offers online services, making it easier for customers and encouraging them to use the hotel's services again. Moreover, this concept is based on sharing and remote management, allowing hoteliers to access technology regardless of their property. Lastly, ABCD can significantly assist policymakers, investors, and hospitality sector leaders in reaching development goals by providing platforms for information sharing and interaction among all stakeholders. These platforms can motivate stakeholders to utilize online services, which can enhance a company's financial performance by lowering costs and boosting profit margins.

## 6. Conclusion and future research direction

This study explores the adaptation of the ABCD technology model for the hospitality industry, aiming to enhance cost-effectiveness and efficiency for better strategic performance. Notably, it identifies a gap in research regarding the use of technologies like AI, blockchain, cloud computing, and data analytics in hotel management in Bangladesh. The research also emphasizes the importance of hotel websites, highlighting the need for regular updates and consistent features, while addressing user perceptions. By focusing on key website features, hotels can improve bookings through their branded sites. It also underpinned four essential foundational technologies that define the Fourth Industrial Revolution, collectively known as ABCD technologies: artificial intelligence, blockchain, cloud computing, and data analytics. These technologies, though developed separately over time, have become intertwined, driving groundbreaking innovations. This study explores their complex relationships and contributions to emerging technologies, using ChatGPT, the Internet of Things (IoT), and blockchain as examples. It also offers guidance for businesses and policymakers on leveraging these foundational technologies in the rapidly evolving landscape of the Fourth Industrial Revolution and beyond.

---

However, information and communication technologies (ICTs) are crucial in transforming the hotel industry and will continue to shape its future operations. This study only investigates the adoption of the ABCD technology model for hotels, focusing on data-driven applications from ICT-enabled sources, particularly the web content of Bangladeshi hotel enterprises. But it omitted the assessment of benefits and the challenges faced by hospitality organizations in Bangladesh, where technological advancement is seen as a significant opportunity but also presents management hurdles. Integrating advanced technology requires careful decision-making and organizational commitment. While generalizing findings may pose methodological issues, this research provides insights into the technology landscape in Bangladeshi hotels, also creates opportunities in revealing differences in adoption based on urban versus commercial areas. For example, blockchain technology, often linked to secure payment systems, is underutilized in the hospitality sector, mainly in commercial regions. This exploratory study paves the way for future research to address such limitations.

### Funding

This research received no external funding.

### Conflicts of Interest

The authors declare no conflict of interest.

### Citation

Sanju, N. L. (2024). ABCD technology integration in the hospitality industry of Bangladesh: An analysis of web content. *Bangladesh Journal of MIS*, 10(2), 43–64. <https://doi.org/10.61606/BJMIS.V10N2.A3>

---

### References

- Akehurst, G. (2008). User generated content: the use of blogs for tourism organisations and tourism consumers. *Service Business*, 3(1), 51–61.
- Akter, S. and Wamba, S.F. (2016). Big data analytics in E-commerce: a systematic review and agenda for future research. *Electronic Markets*, 26(2), pp.173-194.
- Akter, S.; et al. (2020) 'Transforming Business Using Digital Innovations: The Application of AI, Transforming Business Using Digital Innovations: The Application of AI, Blockchain, Cloud and Data Analytics Blockchain, Cloud and Data Analytics', 2020, pp. 1–33.
- Ali, F., Yasar, B., Ali, L. and Dogan, S. (2023), "Antecedents and consequences of travelers' trust towards personalized travel recommendations offered by ChatGPT", *International Journal of Hospitality Management*, Vol. 114, 103588,doi:10.1016/j.ijhm.2023.103588.
- Ali, M.B., Tuhin, R., Alim, M.A., Rokonzaman, M., Rahman, S.M. and Nuruzzaman, M. (2024), "Acceptance and use of ICT in tourism: the modified UTAUT model", *Journal of Tourism Futures*, Vol. 10 No. 2,pp.334-349. doi.org/10.1108/JTF-06-2021-0137
- Ali Köseoglu, M., Ross, G., & Okumus, F. (2016). Competitive intelligence practices in hotels, *International Journal of Hospitality Management*, 53, 161–172.
- Almorsy, M., Grundy, J., & Müller, I. (2016). An analysis of the cloud computing security problem. preprint arXiv:1609.01107.

- Azhar Mohd Harif, M.A., Nawaz, M. and Hameed, W.U. (2022) 'The role of open innovation, hotel service quality and marketing strategy in hotel business performance', *Heliyon*, 8(9), p. e10441.  
doi:10.1016/j.heliyon.2022.e10441.
- Aziz, A.A. *et al.* (2012) 'Information and communication technology application's usage in hotel industry', *Journal of Tourism, Hospitality & Culinary Arts (JTHCA)*, 4(2), pp. 34–48.
- Bader, E. E. (2005). Sustainable hotel business practices. *Journal of Retail & Leisure Property*, 5(1), 70–77.
- Barwise, P.; Farley, J.U. (2005) The State of Interactive Marketing in Seven Countries: Interactive Marketing Comes of Age. *J. Int. Mark.* 19, 67–80.
- Battisti, E., Shams, S. R., Sakka, G., & Miglietta, N. J. B. P. M. J. (2019). Big data and risk management in business processes: implications for corporate real estate.
- Bayo-Moriones, A.; Billón, M.; Lera-López, F. (2013). Perceived performance effects of ICT in manufacturing SMEs. *Ind. Manag. Data Syst.*, 113, 117–135.
- Bell A, Hollander D (2018) Blockchain and distributed ledger technology at travelport, pp 1–12 [A travel port white paper]. Retrieved from <https://www.travelport.com/sites/default/files/travelport-blockchain-whitepaper.pdf>
- Bo, K. S. (2018). Cloud Computing for Business. *International Journal of Advances in Scientific Research and Engineering*, 4 (7), p.156-160
- Bodkhe, U. *et al.* (2019) 'BloHosT: Blockchain enabled smart tourism and hospitality management', CITS 2019 - Proceeding of the 2019 International Conference on Computer, Information and Telecommunication Systems [Preprint].  
doi:10.1109/CITS.2019.8862001.
- BTRC. (July 2009). National ICT Policy 2009. Retrieved August 03, 2019 <http://www.btrc.gov.bd/ict-policy>
- Buhalis, D. (2020). Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review*, 75(1), 267–272.
- Buhalis, D., & Foerste, M. (2015). SoCoMo marketing for travel and tourism: Empowering co-creation of value, *Journal of Destination Marketing & Management*, 4(3), 151–161.
- 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.
- Camilleri, M. A. J. C., MA . (2019). The Use of Data-Driven Technologies for Customer-Centric Marketing, *International Journal of Big Data Management*. Forthcoming.
- Carr, N.G. (2008). *The big switch: Rewiring the world, from Edison to Google*. WW Norton & Company.
- Cecowski, M., Becker, S., Lehrig, S. (2017). *Cloud Computing Applications*. Springer International Publishing, Cham, pp. 47–60.
- Chavan, Pravin & Havale, Dhanashri & Khang, Alex. (2024). Artificial Intelligence and Tourism: A Bibliometric Analysis of Trends and Gaps. 10.4324/9781032688305-24.
- Chen, C. and Wei, Z. (2024), "Role of Artificial Intelligence in travel decision making and tourism product selling", *Asia Pacific Journal of Tourism Research*, Vol. 29 No. 3, pp. 1-15, doi: 10.1080/ 10941665.2024.2317390.
- Chen, H., Chiang, R. H. L. & Storey, V. C. (2012). Business Intelligence and Analytics: From Big Data to Big Impact, *MIS quarterly* 36(4), 1165-1188.
- Chen, J., Wang, Y., & Wang, X. (2012). On-Demand Security Architecture for Cloud Computing. *Computer*, 45(7), 73–78.
- Chowdhury, S. R., Guha, S., & Sanju, N. L. (2024). Artificial Intelligence Enabled Human Resource Management: A Review and Future Research Avenues. *Archives of Business Research*, 12(6), 94–111.  
<https://doi.org/10.14738/abr.126.17050>

- Cobanoglu, C., Berezina, K., Kasavana, M. L., & Erdem, M. (2011). The Impact of Technology Amenities on Hotel Guest Overall Satisfaction, *Journal of Quality Assurance in Hospitality & Tourism*, 12(4), 272–288.
- Davenport, T. H. (2014). *Big Data at Work*, Boston, MA: Harvard Business School Publishing
- Del Vecchio, P. D., Mele, G., Ndou, V., & Secundo, G. (2018). Creating value from Social Big Data: Implications for Smart Tourism Destinations. *Information Processing & Management*, 54(5), 847–860.
- Dettoni, J. (2020). Bangladesh targets ICT industry as future growth engine. Retrieved from: <https://www.fdiintelligence.com/article/77130>.
- Díaz, E.; Martín-Consuegra, D.; Esteban, Á. (2015). Is ICT good for employees? An analysis of its effects on sales agents' perceptions of service cannibalization. *Comput. Hum. Behav.*, 51, 263–271.
- Dogru T, Mody M, Leonardi C (2018, Winter) Blockchain technology & its implications for the hospitality industry. *Boston Hospitality Review*. Retrieved from <https://www.bu.edu/bhr/2018/02/13/blockchain-technology-its-implications-for-the-hospitality-industry>
- El Kadiri, S.; Grabot, B.; Thoben, K.D.; Hribernik, K.; Emmanouilidis, C.; Von Cieminski, G.; Kiritsis, D. (2016), Current trends on ICT technologies for enterprise information systems. *Comput. Ind.*, 79, 14–33.
- Epiknetworks, (2018). How artificial intelligence is transforming the hotel industry.
- Evans G., & Peacock M. (2000). Small is Beautiful? ICT and Tourism SMEs: a Comparative European Survey. In D. R. Fesenmaier, S. Klein, & D. Buhalis (Eds.), *Information and Communication Technologies in Tourism 2000*. Vienna: Springer.
- Fatima, J. K., Ghandforoush, P., Khan, M., & Mascio, R. D. (2019). Mobile learning adoption for tourism education in a developing country. *Current Issues in Tourism*, 22(4), 420–427.
- Filimonau, V. and Naumova, E. (2020) 'The blockchain technology and the scope of its application in hospitality operations', *International Journal of Hospitality Management*, 87(September 2019), p. 102383. doi:10.1016/j.ijhm.2019.102383.
- Francis, F. (2019). Robotics in hospitality: how will it impact guest experience?
- Fuchs, M., Scholochov, C., & Höpken, W. (2009). E-Business Adoption, Use, and Value Creation: An Austrian Hotel Study. *Information Technology & Tourism*, 11(4), 267–284.
- Gangwar, H., Date, H., Ramaswamy, R., (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. *J. Enterprise Inf. Manage.* 28, 107–130.
- Gobble, M. M. (2013). Big data: The next big thing in innovation. *Research-technology management*, 56(1), 64-67.
- Goudarzi H, Martin JI (2018) Blockchain in aviation. Retrieved from International Air Transport Association website: <https://www.iata.org/contentassets/2d997082f3c84c7cba001f506edd2c2e/blockchain-in-aviation-white-paper.pdf>
- Guttentag, D. A. (2010). Virtual reality: Applications and implications for tourism. *Tourism Management*, 31(5), 637–651.
- Haaser, C., Massa I., Beillevaire, S., Lissorgues, A., and Atallah, M. (2018) Artificial intelligence: A game changer in the hospital industry.
- Hjalager, A. M. (2010). A review of innovation research in tourism. *Tourism Management*, 31(1)1-12.
- Ho, C. I., Lin, M. H., & Chen, H. M. (2012). Web users' behavioural patterns of tourism information search: From online to offline. *Tourism Management*, 33(6), 1468–1482.
- Hopkins, G., (2011). Why the Cloud is Right for Hospitality
- HTNG (2018) Blockchain for hospitality. Retrieved from Hospitality Technology Next Generation website: <https://www.hospitalitynet.org/file/152008497.pdf>

- Huang, D., Jin, X., Huang, J. and Kong, S. (2023), "Tourist acceptance of robot chefs in gastronomy experiences: a behavioural reasoning perspective", *Tourism Management Perspectives*, Vol. 48, 101172, doi: 10.1016/j.tmp.2023.101172.
- Irvin C, Sullivan J (2018) Using blockchain to streamline airline finance, pp 1–6.
- Irvine, W., and Anderson A. R. (2008). ICT (information communication technology) , peripherally and smaller hospitality businesses in Scotland. *International Journal of Entrepreneurial Behavior & Research*, 14(4), 200-218.
- Jaremen, D. E, Jędrasiak, M., & Rapacz, A. (2016). The concept of smart hotels as an innovation on the hospitality industry market-case study of PURO hotel in Wrocław, *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Ekonomiczne Problemy Turystyki*, 36(4), 65-75.
- Jaremen, D. E. (2016). Advantages from ICTs usage in hotel industry. *Czech Journal of Social Sciences, Business and Economics*, 5, 6-17.
- Jorgenson, D.W.; Vu, K.M. (2016), The ICT revolution, world economic growth, and policy issues. *Telecommun. Policy*, 40, 383–397.
- Kamble, S., Gunasekaran, A., Arha, H., (2018). Understanding the Blockchain technology adoption in supply chains-Indian context. *Int. J. Prod. Res.* 1–25.
- Kamble, S.S., Gunasekaran, A., Kumar, V., Belhadi, A., Foropon, C., (2020). A machine learning based approach for predicting blockchain adoption in supply Chain. *Technol. Forecast. Soc. Change*.
- Kant, K. (2020). Bangladesh's per capita GDP now higher than eastern and northeastern India. *Business Standard*. Retrieved from <https://www.business-standard.com/article/economy-policy/bangladesh-sper-capita-gdp-now-higher-than-eastern-and-northeastern-india-120021201715>
- Kärle, E., & Fensel, A. (2015). Multi-platform mobile service creation. *Proceedings of the 13th International Conference on Advances in Mobile Computing and Multimedia - MoMM 2015*.
- Kazak, A.N., Chetyrbok, P. V. and Oleinikov, N.N. (2020) 'Artificial intelligence in the tourism sphere', *IOP Conference Series: Earth and Environmental Science*, 421(4).doi:10.1088/17551315/421/4/042020.
- Kazandzhieva, V., & Santana, H. (2019). E-tourism: Definition, development and conceptual framework. *Tourism: An International Interdisciplinary Journal*, 67(4), 332-350.
- Khan, O. F. (2020). Information and Communication Technology (ICT) Status, issues and future development plans of Bangladesh. Retrieved from: <http://www.btrc.gov.bd>.
- Kuberkar, S., Singhal, T.K., 2020. Factors influencing adoption intention of ai powered chatbot for public transport services within a smart city. *Int. J. Emerg. Technol.*
- Kwok, A. O. J., & Koh, S. G. M. (2018). Is blockchain technology a watershed for tourism development? *Current Issues in Tourism*. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/13683500.2018.1513460>
- Larchet V (2017) Blockchain: solution for the black market threat to the tourism industry, pp 1–14.
- Lasek, M., & Jessa, S. (2013). Chatbots for customer service on hotels' websites. *Information Systems in Management*, 2(2), 146-158.
- Law, R. and Hsu, C.H.C. (2005) 'Customers' perceptions on the importance of hotel web site dimensions and attributes', *International Journal of Contemporary Hospitality Management*, 17(6), pp. 493–503. doi:10.1108/09596110510612130.
- Law, R.; Leung, D.; Chan, I.C.C. (2019), Progression and development of information and communication technology research in hospitality and tourism. *Int. J. Contemp. Hosp. Manag.*
- LE, N.N.K. and Bui, B.T.T. (2022) 'Factors Affecting Online Hotel Selection Behavior of Domestic Tourists: An Empirical Study from Vietnam',

- 
- The Journal of Asian Finance, Economics and Business, 9(5), pp. 187–199. doi:10.13106/jafeb.2022.vol9.no5.0187.
- Lemley, J., Bazrafkan, S., Corcoran, P. (2017). Deep Learning for Consumer Devices and Services: Pushing the limits for machine learning, artificial intelligence, and computer vision. IEEE Consumer Electronics Magazine 6, 48–56.
- Leung, R., & Law, R. (2012). Evaluation of Hotel Information Technologies and EDI Adoption. Cornell Hospitality Quarterly, 54(1), 25–37.
- Li, F. (2018). The digital transformation of business models in the creative industries: A holistic framework and emerging trends. Technovation.
- Lin, H., Chi, O.H. and Gursoy, D. (2020) 'Antecedents of customers' acceptance of artificially intelligent robotic device use in hospitality services', Journal of Hospitality Marketing and Management, 29(5), pp. 530–549. doi:10.1080/19368623.2020.1685053.
- Liu, J.N.K. and Zhang, E.Y. (2014) 'An investigation of factors affecting customer selection of online hotel booking channels', International Journal of Hospitality Management, 39, pp. 71–83. doi:10.1016/j.ijhm.2014.01.011.
- Manyika, J., Chui, M., Lund, S. and Ramaswamy, S. (2017). What's now and next in analytics, AI, and automation. McKinsey Global Institute, pp.1-12.
- Mathayomchan, B., & Sripanidkulchai, K. (2019). Utilizing Google translated Reviews from Google maps in sentiment analysis for Phuket tourist attractions. In 2019 16th International Joint Conference on Computer Science and Software Engineering (JCSSE). Chonburi: IEEE, the 10th-12th July, pp. 260–265.
- McGettigan, Timothy, (2016). Artificial Intelligence: Is Watson the Real Thing?
- Mihalič, T., & Buhalis, D. (2013). ICT as a new competitive advantage factor – Case of small transitional hotel sector. Economic and Business Review, 15(1), 33-56.
- Morrison, A.M., Taylor, S., Morrison, A.J. and Morrison, A.D. (1999), "Marketing small hotels on the world wide web", Information Technology & Tourism, Vol. 2 No. 2, pp. 97-113.
- Mowla, M. M. (2019). E-tourism: An innovative and sustainable approach to appreciate the economic growth in Bangladesh. International Journal of Advances in Management and Economics, 8(2), 1–10.
- Murphy, J., Hofaker, C., & Gretzel U. (2017). Dawning of the age of robots in hospitality and tourism: Challenges for teaching and research. European Journal of Tourism Research, 15, 104–111.
- Najafi pour, A. A., Fallah, Y. A., Foroozanfar, M. H., & Ziaee Adib, S. M. (2019). Developing a model for tourism smart card and evaluating its effect on tourism services. Tourism: An International Interdisciplinary Journal, 67(2), 147-158.
- Nam K, Dutt CS, Chathoth P, Khan MS (2019) Blockchain technology for smart city and smart tourism: Latest trends and challenges. Asia Pac J Tour Res 1–15.
- Nam, K. *et al.* (2021) 'The adoption of artificial intelligence and robotics in the hotel industry: prospects and challenges', Electronic Markets, 31(3), pp. 553–574. doi:10.1007/s12525-020-00442-3.
- Nyabuti, R. (2018). The Impact of Business Intelligence on Corporate Performance Management: A Study of Equity Ban.
- Ohlan, R. (2018). Role of Information Technology in Hotel Industry. International Journal of Scientific Research in Computer Science, Engineering and Information Technology, 3(2), 277-281.
- Ollo-Lopez, A.; Aramendia-Muneta, M.E. (2012). ICT impact on competitiveness, innovation and environment. Telematics Inform., 29, 204–210.
- Önder I, Treiblmaier H (2018) Blockchain and tourism: three research propositions. Ann Tour Res 72(C):180–182.
- Orfi la-Sintes, F., Crespi-Cladera, R., & Martinez-Ros, E. (2005). Innovation Activity in the Hotel

- 
- Industry: Evidence from the Balearic Islands, Tourism Management, 26(6), 851-865.
- Ozturk, A. B., Bilgihan, A., Nusair, K., & Okumus, F. (2016). What keeps the mobile hotel booking users loyal? Investigating the roles of self-efficacy, compatibility, perceived ease of use, and perceived convenience. *International Journal of Information Management*, 36(6), 1350–1359.
- Pejic, A., Pletl, S., & Pejic, B. (2009). An expert system for tourists using Google Maps API. In 2009 7th International symposium on intelligent systems and informatics. Beijing: IEEE, the 28th-30th August, pp. 317–322.
- Pérez-López, R.J.; OlguínTiznado, J.E.; MojarroMagaña, M.; Camargo Wilson, C.; López Barreras, J.A.; García-Alcaraz, J.L. (2019). Information sharing with ICT in production systems and operational performance. *Sustainability*, 11, 3640.
- Pilkington M (2017) Can blockchain technology help promote new tourism destinations? The example of medical tourism in Moldova. SSRN Scholarly Paper No. ID 2984479.
- Pivčević, S., & Garbin Praničević, D. (2012). Innovation Activity in the Hotel Sector - The Case of Croatia. *Ekonomika Istrazivanja - Economic Research*, 25(1), 337-363.
- Praničević, D.G. and Mandić, A. (2020) 'ICTs in the hospitality industry: An importance-performance analysis among small family-owned hotels', *Tourism*, 68(2), pp. 221–234. doi:10.37741/T.68.2.9.
- Priyadarsini, R., Xuchao, W., & Eang, L. S. (2009). A study on energy performance of hotel buildings in Singapore. *Energy and Buildings*, 41(12), 1319–1324.
- Radde, B. (2017). Digital Guest Experience: Tools to help hotels to manage and optimize the digital guest experience. Hamburg, Germany: Tredition, GmbH.
- Rahman, M.K. and Hassan, A. (2021) 'Tourist Experience and Technology Application in Bangladesh', *Technology Application in the Tourism and Hospitality Industry of Bangladesh*, pp. 319–332. doi:10.1007/978-981-16-2434-6\_19.
- Roblek, V., Meško Štok, Z., & Meško, M. (2016). Complexity of a sharing economy for Tourism and hospitality, *Tourism & Hospitality Industry 2016, Congress Proceedings*, 374-387.
- Rodríguez-Espíndola, O. et al. (2022) 'Analysis of the adoption of emergent technologies for risk management in the era of digital manufacturing', *Technological Forecasting and Social Change*, 178(February), p. 121562. doi:10.1016/j.techfore.2022.121562.
- Sabi, H. M., Uzoka, F.-M. E., Langmia, K., & Njeh, F. N. (2016). Conceptualizing a model for adoption of cloud computing in education. *International Journal of Information Management*, 36(2), 183-191.
- Sakib, M.N., Chowdhury, S.R., Younus, M. et al. (2024), How HR analytics evolved over time: a bibliometric analysis on Scopus database. *Futur Bus J* 10, 87. <https://doi.org/10.1186/s43093-024-00375-9>
- Saleem, F.; Salim, N.; Altalhi, A.H.; Ullah, Z.; AL-Malaise AL-Ghamdi, A.; Mahmood Khan, Z. (2020), Assessing the effects of information and communication technologies on organizational development: Business values perspectives. *Inform. Technol. Dev.*, 26, 54–88.
- Sanju, N. L. (2024). Artificial intelligence in hospitality: a bibliometric review and research agenda. *Social Science and Management*.1(3):28-38 DOI: <https://doi.org/10.61784/ssm3024>.
- Sanju, N. L. (2023). Trends of information systems in tourism: A review of literature. *International Journal of Research and Review*, 10(12), 229-241. <https://doi.org/10.52403/ijrr.20231227>
- Sardar, S. (2019) 'Sazu Sardar, D., Hossain, M. E., Kamruzzaman, M., & Ray, R. (2021). ICT APPLICATIONS IN TOURISM AND HOSPITALITY INDUSTRY OF BANGLADESH: A RESEARCH REVIEW.'

- Sardar, S., Hossain, M. E., Hossain, M. I., & Islam, M. (2020). Factors affecting visitor's satisfaction: an empirical study on the Paharpur Buddha Vihara, Naogaon, Rajshahi. *Int. J. Manag. Account*, 2(4), 61- 73.
- Sarker, M. S. I., & Dash, S. C. (2024). ROLE OF INFORMATION TECHNOLOGY AND TOURISM PROMOTION IN BANGLADESH. *International Journal of Marketing Research Innovation*, 9(1), 1-11. doi.org/10.46281/ijmri.v9i1.2240
- Sathi, A. (2012). *Big Data Analytics: Disruptive Technologies for Changing the Game*. Boise, USA. IBM Corporation., ID: MC press.
- Seggitur & ClctourGUNE (2014). Improving Competitiveness in the Caribbean Tourism Sector through ICT-based Innovations. Inter-American Development Bank.
- Senyo, P., Addae, E., & Boateng, R. (2018). Cloud Computing research: A review of research themes, frameworks, methods and future research directions. *Journal of Enterprise Information Management*, 39(1), 129–139.
- Senyo, P., Effah, J., & Addae, E. (2016). Preliminary insight into cloud computing adoption in a developing country. *Journal of Enterprise Information Management*, 29(4), 505–524.
- Shams, S. M. R., & Solima, L. (2019). Big data management: implications of dynamic capabilities and data incubator. *Management Decision*, 57(8), 2113-2123.
- Sharma, H., Bansal, H., & Sharma, A. (2015). Cloud computing. on: <http://www.edureka.co/blog/what-is-cloud-computing>.
- Sheppard, S. R., & Cizek, P. (2009). The ethics of Google Earth: Crossing thresholds from spatial data to landscape visualisation. *Journal of Environmental Management*, 90(6), 2102–2117.
- Sirirak, S., Islam, N. and Khang, D.B. (2011) 'Does ICT adoption enhance hotel performance?', *Journal of Hospitality and Tourism Technology*, 2(1), pp. 34–49. doi:10.1108/17579881111112403
- Steinfeld, C.; LaRose, R.; Chew, H.E.; Tong, S.T. (2012), *Small and medium-sized enterprises in rural business clusters: The relation between ICT adoption and benefits derived from cluster membership*. *Inform. Soc.*, 28, 110–120.
- Tong-On, P., Siripipatthanakul, S. and Phayaphrom, B. (2021) 'The implementation of business intelligence using data analytics and its effects towards performance in hotel industry in Thailand', *International Journal of Behavioral Analytics*, 1(2), pp. 1–17. <https://ssrn.com/abstract=3944077>.
- Tredinnick, L., (2017). Artificial intelligence and professional roles. *Business Information Review* 34, 37-41.
- Treiblmaier H (2018), The impact of the blockchain on the supply chain: a theory-based research framework and a call for action. *Supply Chain Manag Int J* 23(6), 545–559.
- Treiblmaier, H. (2020) 'Handbook of e-Tourism', *Handbook of e-Tourism [Preprint]*, (August). doi:10.1007/978-3-030-05324-6.
- Tung, V. W. S., & Law, R. (2017). The potential for tourism and hospitality experience research in human-robot interactions. *International Journal of Contemporary Hospitality Management*, 29(10), 2498–2513.
- Umrani, W.A., (2016). Moderating Effect of Organizational Culture on the Relationship between Corporate Entrepreneurship and Business Performance in Pakistan's Banking Sector. *Universiti Utara Malaysia*.
- Van Niekerk, M. (2016). Business, technology, and marketing trends influencing the financial performance of the hotel industry. *The Journal of Hospitality Financial Management*, 24(2), 153- 157.
- Vella, Elaine, Yang, Longzhi, Anwar, Naveed and Jin, Nanlin (2018) Adoption of Cloud Computing in Hotel Industry as Emerging Services. In: *Transforming Digital Worlds. iConference 2018. Lecture Notes in Computer Science (10766)*. Springer, Cham, pp. 218- 228.
- Verma, S., Bhattacharyya, S.S., Kumar, S., (2018). An extension of the technology acceptance model in the big data analytics system

- implementation environment. *Inf. Process Manage.* 54, 791–806.
- Wamba, S.F., Akter, S., Edwards, A., Chopin, G. and Gnanzou, D. (2015). How ‘big data’ can make big impact: Findings from a systematic review and a longitudinal case study. *International Journal of Production Economics*, 165, pp.234-246.
- Wang Z, Wang N, Su X, Ge S. (2020). An empirical study on business analytics affordances enhancing the management of cloud computing data security. *International Journal of Information Management*, 50, 387-94.
- Weill, P., & Woerner, S. L. (2018). Is Your Company Ready for a Digital Future? *MIT Sloan Management Review*, 59(2), 21-25.
- Wernerfelt, B., 1984. A resource-based view of the firm. *Strategic Manage. J.* 5, 171–180.
- Willie P (2019) Can all sectors of the hospitality and tourism industry be influenced by the innovation of blockchain technology? *Worldwide Hosp Tour Themes*. <https://doi.org/10.1108/WHATT-11-2018-0077>
- WTM (2019). Artificial intelligence and automation to increase hotel revenues by 10% and cut costs by 15%. URL: <https://news.wtm.com/artificial-intelligence-and-automation-to-increase-hotel-revenues-by-10-and-cut-costs-by-15-says-atm-report/>. Jan 16. Retrieval: 20. 12. 2019.
- WTTC. (2020a). BANGLADESH 2020 ANNUAL RESEARCH: KEY HIGHLIGHTS.
- WTTC. (2020b). Economic Impact Reports. Retrieved from <https://wttc.org/Research/Economic-Impact>
- Xia, T., Zhang, W., Chiu, W.S. and Jing, C. (2020). Using cloud computing integrated architecture to improve delivery committed rate in smart manufacturing. *Enterprise Information Systems*, pp.1-20.
- Yang, L., Zohu, G., Sun, L. (2022). Application and exploration of ‘ABCD’ Technology in the field of Internet Customer Finance. *International conference of big data, Information and Computer network*, IEEE.
- Ying W, Jia S, Du W (2018) Digital enablement of blockchain: evidence from HNA group. *Int J Inf Manag* 39:1–4.
- Yurtlu, M. (2020) ‘Special Issue on Managing Tourism Across Continents Current Cloud-Based Software Services Used in Online Marketing of Hotels in Turkey Türkiye’de Otellerin Çevrimiçi Pazarlamasında Kullanılan Bulut Tabanlı Güncel Yazılım Hizmetleri’, (December).
- Zalama, E., García-Bermejo, J. G., Marcos, S., Domínguez, S., Feliz, R., Pinillos, R., & López, J. (2014). Sacarino, a Service Robot in a Hotel Environment. *Advances in Intelligent Systems and Computing*, 3–14.
- Zapalska, A. M., Brozik, D. i Zieser, N. (2015). Factors affecting success of small business enterprises in the Polish tourism industry. *Tourism: An International Interdisciplinary Journal*, 63(3),365-381.
- Zikria, Y.B.; Kim, S.W.; Hahm, O.; Afzal, M.K.; Aalsalem, M.Y. (2019), Internet of Things (IoT) operating systems management: Opportunities, challenges, and solution. *Sensors*, 19, 1793.