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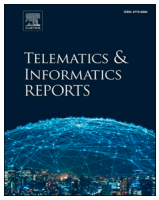

Analyzing factors influencing smart technology adoption in an emerging economy's tourism and hospitality sector

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ABSTRACT

The increased digitalization of the tourism and hospitality sector has contributed to the necessity of introducing smart technologies that facilitate the enhancement of service quality and customer satisfaction. The research investigates the factors that affect the adoption of smart technologies in the tourism and hospitality industry in Bangladesh by using an extension of the Technology Acceptance Model (TAM). Namely, Perceived usefulness (PU), Perceived Ease of Use (PEOU), Service Quality (SQ), Social Influence (SI) and Perceived Trust (PT) were integrated as predictors of Attitude Towards Use (ATU) and Behavioral Intention (BI). This study adopted a quantitative research approach. Data was collected via a web-based survey using convenience sampling and yielded 327 usable responses from Bangladeshi nationals with experience using smart technology applications during travel. It showed a significant impact of PU and PEOU on ATU and BI. Also, SQ, PT, SQ have a strong positive impact on Attitude, which is in line with previous extended uses of TAM. PU is the strongest contributing factor to Behavioral Intention. This research study has added to the literature by expanding TAM in the context of a developing country involving service and trust constructs. It satisfies a research gap by reporting these variables empirically concerning the smart tourism sector in South Asia, where little to no research exists pertaining to technology adoption in the service sector of Bangladesh. The findings highlight the importance of tourism businesses and policymakers in intensifying digital infrastructure, establish trust among users and stressing the feasible functionality of smart technologies. Incorporating these factors, stakeholders can speed up digital transformation and enhance competitiveness in the tourism and hospitality sector of Bangladesh.

1. Introduction

The tourism and hospitality sector plays a significant role in enhancing the socioeconomic development of Bangladesh with destinations like Sundarban's and Cox's Bazar. Tourism attractions are vital for Bangladesh's socioeconomic development, contributing significantly to GDP through foreign exchange earnings, job creation, and foreign investment [1]. Tourist attractions play an important role in Bangladesh's economy, contributing about 3 % of the country's GDP and highlighting the growing importance of innovation in tourism development [2]. Over the past few years, ICT, IoT, mobile applications, AI, and AR/VR have been incorporated into the idea of smart tourism framed by global organizations like UNWTO as efficient, personalized and sustainable service provision in the tourism industry. Although some smart destinations are emerging worldwide, Bangladesh is lagging in adapting to changes to be on the same platform with other destinations with the difference between the expectations and experiences of a tourist taking place in Bangladesh [3]. In this context, PU PEOU, SQ, SI and PT, which are key constructs of TAM, are critical in terms of knowledge on adoption behaviors. TAM has been extensively verified as a tool used in forecasting adoption of technology and further developed to include trust and SQ constructs [4,5]. However, studies of the extended TAM used in the context of Bangladesh's tourism are still limited [6,3]. This study fills the gap that the lack of empirical TAM extensions in South Asian tourism, by investigating the key motivators for the adoption of smart technology among industry players and consumers but only from within the context of Bangladesh's tourism industry and consequently presents a context specific framework.

Although smart tourism technologies have been proven to improve quality of service and customer satisfaction as well as revisit intention in other countries, they have not been embraced uniformly in the Bangladesh tourism and hospitality industry. The lack of proper digital infrastructure and unequal services based on the use of smartphones hinders the possibility of interacting effectively with tourists [3].

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According to the Bangladesh Bureau of Statistics (BBS), 98.9 % of households in Bangladesh used mobile phones, while 72.4 % used smartphones in the first quarter of FY 2025–26, highlighting the expanding penetration of digital communication technologies [7]. Such a level of penetration, though increasing, restricts the projection of all-inclusive digital tourism services. Besides, apparent mistrust in online travel companies and payment systems is a factor that remains prevalent among Bangladesh users [8]. In spite of the identification of the global benefits of smart tourism [9], there is limited context-specific empirical evidence supporting adoption in developing countries, particularly in Bangladesh [3]. The previous research in Bangladesh dwells on macro-level gaps in the sphere of services [1] or concentrates on trust in OTA systems but does not connect it to the TAM conceptualization. Thus, this study is necessary to examine the impact of PU, PEOU, SQ, SI and PT affecting attitudes and behavioral intentions of smart technology adoption in the local tourism industry and consequently present a context specific framework.

The study addresses this gap with the following objectives, to assess how the PU and the PEOU affect the ATU and the BI held by the tourism stakeholders and the tourists themselves, in the light of TAM [4,10]. Evaluating the impact of SQ, SI and PT on Attitude toward Use (ATU) is effective for identifying the external constructs that shape technology acceptance [5,8]. An empirical research is conducted to examine the paths among these constructs (PU, PEOU, SQ, SI, PT) to the effect of ATU on Behavioral Intention (BI) using structural equation modeling. To present policy relevant findings to the policymakers and tourism service providers in Bangladesh to improve the introduction of smart technologies and as a result, the national digital transformation agenda such as Smart Bangladesh Vision 2041(e.g., Bangladesh Ministry of ICT).

The study can be considered valuable both in theory and practice. It enriches academically the framework of the TAM with various constructs like quality of services, SI and trust, which are of immense significance in the emerging world like Bangladesh, which is a part of the smart tourism study in Bangladesh, South Asia [8,11]. In practical terms, results will help hotels, travel agencies, policymakers, and tourism boards understand the leverages of promoting smart technology usage, i.e., they will focus on results that help establish trust, ensure reliable service standards, and provide user-friendly designs. These factors contribute to enhancing competitiveness and visitor satisfaction while directly supporting Bangladesh's progress toward key Sustainable Development Goals, including SDG 8 (economic growth through tourism), SDG11 (sustainable communities), and SDG 12 (responsible consumption in tourism services). The research is also in alignment with the national aspirations of Smart Bangladesh that will eventually seek to transform the country economically through the digitalization of its sectors (e.g., Bangladesh Ministry of ICT). Lastly, actions at the institution level and national policy on accelerating digitalization activities in the tourism and hospitality industry can be informed by these findings.

Based on the contextual factors discussed, this research addresses several critical gaps in the literature. First, previous TAM-based studies have focused on core technology variables, including PU and PEOU, with negligence in the joint effect of service-related and contextual antecedent [11,3]. Second, despite the fact that there are prior researches that have looked at each of the three factors singly, SQ, SI, or PT, there are only a limited number that have addressed all three as a single extension to TAM [5,8]. Third, the contextual gap exists since the tourism sector in Bangladesh is not using empirical evidence of an enlarged TAM model that integrates SQ, trust, and SI as a simultaneous unit of explaining the adoption of smart-technology [6]. This study attempts to address these gaps by constructing a comprehensive framework by extending TAM to include SQ, SI, and PT to elucidate Attitude Toward Use (ATU) and Behavioral Intention (BI) in Bangladesh tourism and hospitality sector.

This study aims to accomplish the following specific objectives:

1. To test the impact of PU, PEOU, SQ, SI and PT on ATU and BI.
2. To create a contextualized TAM framework for smart tourism adoption in Bangladesh.

Therefore, based on above discussion, our study will answer these questions:

RQ1. How do PU, PEOU, SQ, SI, and PT affect Attitude Toward Use (ATU) and Behavioral Intention (BI) in the context of smart tourism adoption in Bangladesh?

RQ2. Does ATU mediate the relationship between the key antecedents (PU, PEOU, SQ, SI and PT) and Behavioral Intention (BI) among tourism stakeholders and tourists in Bangladesh?

2. Literature review

2.1. Technology acceptance model (TAM)

Davis [4] proposed that behavioral intentions and use of information technology could be explained through the TAM. Accordingly, TAM accounts for a significant proportion of consumer behavioral intention to adopt technological innovations. The TAM is one of the theories where it is believed that the acceptability of a new technology relies on people's perception that the new technology is useful and easy to use. This model becomes applicable in predicting the likelihood of people to adopting a given technology and the reasons that can push an adoption. TAM is a model that aims at defining the major reasons for adopting or rejecting a new technology. It tries to describe the attitude and intentions of users regarding the use of the computing technologies to get the understanding of how the factors influence the choices users make when adopting different types of computing technologies [12].

TAM tries to provide predictions and explanations in the use of the technology as it emphasizes two important constructs (a) PU which is the usefulness of a technology and (b) PEOU, which is an estimate of how easy the technology is to use. The two elements are important determinants of the effectiveness of the technology whether users will embrace the technology [12].

In this version, the PU is regarded as the degree to which a user believes that the utilization of a prescribed technology improves his or her performance in the work place. Similarly, the construct of PEOU encompasses the extent to which the user thinks that using the technology will be effortless and unstrained [12]. Most of the studies has shown that PU is a critical factor in adoption of the new technology whereas the importance of PEOU has been diminishing as people get accustomed to the new technology over time [13].

2.2. Perceived usefulness (PU)

PU refers to the level to which an individual holds the view that utilization of a given system would improve his or her work performance [4]. It presents the perceived benefits and advantages of the users based on the use of any technology that is present in the application system. In the connection with trust, users can complete their tasks more easily through technological support [14]. The technological benefit can convince users to believe in the potential of the application system to cope with their work issues and guarantee better results; an example is AI-based chatbots facilitating hotel bookings and customer requests and increasing the PU by both service providers and travelers. Thus, the application system may be perceived as an encouraging service system that users can count on [15]. PU, defined as the extent to which a person believes that using the system will enhance his or her performance [16]. According to TAM, PU is also influenced by PEOU because, other things being equal, the easier the system is to use the more useful it can be [16].

In tourism, PU demonstrates the usefulness of smart technology tools like Wearable Technology, Mobile Technology, Internet of Things (IoT), Chatbots, Robots, Virtual Reality (VR), Social media platforms in

helping travels plan and organize their trips. These tools can help users get real-time notices, travel tips, and location-based ones, which can enhance the decision-making process by rendering it more informative. As an example, the tourists who visit Cox's Bazar can receive instant hotel bookings, restaurant suggestions and live traffic information through mobile apps to plan their stays more efficiently.

2.3. Perceived ease of use (PEOU)

PEOU, also referred to as perceived ease is the feeling that a user can use a given application system to perform tasks without effort [17]. In information technology (IT), ease of use provides users with a variety of functional tools to accomplish tasks more efficiently. In terms of the link with PU, the application system that is easier to use is able to save more time and effort for users [18]. Currently the ease of use of IT can assist the user to complete the tasks without efforts and get the results faster. It has been unveiled that the user friendliness of technology offers users novelties that could be regarded as technological benefits to enable the users to obtain improved work outputs [19]. The ease of using any application system is a peculiarity of getting fast results making the users more confident in using the application system with the firms.

Previous studies have established that users perceive the application system to be less risky when they are certain that it has more convenient functions that enable them to carry out their tasks in time [20].

2.4. Service quality (SQ)

The first step that leads to the success of smart technology adoption is achieving excellent quality in smart technology services. According to previous studies, the better the quality of the service the better the value perceived and consequently the better the attitude that a user has toward a technology [21]. When the quality of an application or product is measured using the services quality, factor and the associated benefits and services, the value of a smart technology adoption has been perceived to be greater.

Based on this, when a tourist feels that a smart technology tools is one that provides high-quality services then this will augment the probability that the given application will be adopted. According to previous research, SQ has been cited as one of the most powerful predictors under the Delone and Mclean [22] model and that it has a positive influence on actual use [23,24].

The conducted research on smart tourism has revealed that SQ is positively associated with smart technology intentions in tourism industries. In line with this, during our research, services quality will also play a role in inducing tourists to establish and utilize smart technology application in case it appears that quality services will be attained in engaging smart technology application [25,26].

2.5. Social influence (SI)

In the given terms of the study, the role of SI can be described as the degree of effect. The impact of the intention of adopting a new technology because other people have adopted and shared it, which is influenced by family members and friends**.** SI is one of the key drivers of technology adoption. TAM was subsequently expanded to UTAUT2 to include SI as a predictor, reflecting the impact of peers, family, and social networks on intentions to use smart tourism technology [27]. In Bangladesh, as a collectivist culture with high power distance, this further reinforces the impact of SI on adoption behavior [28]. Such areas include intelligent technology in tourism and hospitality [29]. One of the most significant determinants in SI refers to the advice of the family and friends, which have a profound impact on intentions regarding the adoption of smart applications to make bookings and plan their travel.

Considered as an extension to TAM model, it has been included in our study as part of our PLS-SEM analysis. In this way, the study narrows SI on a more specific aspect that is, intention to use in the context of smart technology in tourism.

2.6. Perceived trust (PT)

PT may be described as the willingness of an individual to accept a vulnerability following the positive build-ups that he or she has toward the products and services offered by the other party [30]. Trust is a mental disposition that influences attitudes and actions of an individual. Using the case that the users trust in a particular application system, in the relation to smart technology in tourism, users appear to express positive attitudes, whether acceptance or intention, toward the technology system [31]. With regards to the opinions in the field of technology, users are able to carry out their electronic operations with no worries when they have already believed in the smart technology system. In the hospitality industry scenario of e-reservation software, the bookings made by consumers are hesitant in reserving the room when they have no confidence in the online booking site [32].

PT also becomes a critical role in the case of smart technology adoption in the tourism and hospitality industry in Bangladesh. The users will not utilize new technologies due to cyber security concerns, misuse of information, and lack of transparency unless they have confidence in the system and the agency offering it. Trust diminishes perceived risk and positively correlates with the likeliness of behavioral intentions to use the technology.

2.7. Attitude toward use (ATU)

Based on the TAM model, ATU can be explained by stating that this is the probability that a person is going to integrate smart technology into tourism. The second variable that also plays an influential role in TAM model and other related TAMs is attitude toward use. The studies on smart tourism have confirmed that the correlation between intentions of using smart technology and attitude toward use is positive, staying in the tourism and hospitality sector [33].

In our study, ATU, in turn, contributes to predicting adoption of smart technology. It has been found that attitude turns out to be a key mediator of the significant antecedents PU, PEOU, SI, SQ, PT and BI in the field of technology adoption [34]. Positive perception on the use of smart technology in travel will be effective in making sure that travelers utilize those resources in their preparation of trips. This may happen due to the fact that these cues may simultaneously be a response to the circumstances or a reaction to the situation [35].

2.8. Behavioral intention (BI)

BI refers to the perceived likelihood or the willingness of a person to engage in an act which is, in this case, adopting and using the smart technology in the tourism and hospitality sector. It is the reason that someone engages in a certain action. Behavioral intention is created in the framework of the TAM by Davis [4] to serve as a direct antecedent of the actual usage of the system within the technological adoption setting. The greater the intention to use a technology the higher the chances of adopting a technology and the intention to use a technology depends on the perception visitors have regarding the usefulness and ease of the use of a given technology.

BI has been heavily researched in the situation of smart technology implementation in the tourism and hospitality industry to know how its acceptance among the users. In previous research it has also been stressed that ATU has a strong influence on BI, which is based on the fact that the perception of positive effect of technology towards the technology makes the intention of using it stronger [36,13]. This is reflected in the first hypothesis of this model (Hypothesis H1) which is equivalent to the initial TAM model. Behavioral Intention serves as a point of intimacy in the technology acceptance process, and this is determined by both psychological, social, and system related factors.

The model has five independent variables- SQ; SI; PT; PU; PEOU;

ATU as moderating variable, and BI as the dependent variable (Fig. 1). This model is aimed at determining and quantifying psychological or contextual influences that bring about effective adaptation of smart technology in the tourism and hospitality sector of Bangladesh. In addition, this study assesses the degree to which these TAM components influence the digital behavior of tourists, considering the mediating impact of attitude in this phenomenon as well. It delivers an approach for understanding user adoption framework in tourism within emerging economics like Bangladesh.

Though TAM is a very strong model in explaining the adoption of technologies in numerous environments, its prominence can be particularly relevant in the context of the Bangladesh tourism and hospitality industry because of the unique socio-economic and infrastructural conditions. An example is the widespread implementation of IoT-type smart technologies in Bangladesh that has been reported before, yet acceptance of the methods by the user can be dependent on the quality and credibility of the services, as shown in research on IoT adoption in Bangladesh. Nahida [37] found that the quality of the IoT SQ mediates the relationship between PEOU and BI in one of the samples in Bangladesh. Furthermore, the analysis of the industry level indicates that 4IR technologies (e.g., IoT, AI, VR) are already implemented in the sphere of tourism in Bangladesh, yet issues of infrastructure stability, privacy, and the lack of digital literacy are also significant issues. Moreover, studies on smart tourism ecosystems in Bangladesh indicate that SI and trust would play a decisive role in determining the attitude of the tourists to use smart instruments such as mobile apps, sensors, and automated services [38]. Therefore, the new constructs like PT, SQ, and SI should be incorporated into the TAM framework as theoretically justified but context-driven indispensable in the context of the Bangladeshi smart-tourism setting.

Theoretically, the model used in this study places PU, PEOU, PT, SI, and SQ as independent variables that influence ATU, leading to BI. This synthesis is related to the extended forms of TAM applied in the areas of technology-services (e.g., IoT) and offers a logical, coherent, consistent direction: users should be able to make an assessment of smart technologies in relation not only to their utility (PU) and simplicity (PEOU), but also trust-related beliefs (PT), peer/social pressure (SI), and system performance (SQ). These additional constructs assist in the explanation of adoption outside the conventional TAM which is applicable in the context of Bangladesh where digital infrastructure is different, and users might fear security risks and social unacceptability. This integrated model therefore provides both a theoretically consistent and contextualized framework of how psychological, social, and system-level of reasoning about how psychological, social, and system-level factors interact to drive the implementation of smart technology in tourism in Bangladesh.

3. Hypotheses development

3.1. Relationship between PU and BI

PU is the degree to which people feel that using a specific system can improve their performance in terms of work and experiences with that system [4]. In the hospitality and tourism industry, the functional value of smart technologies is supported by the possibility to increase efficiency, backup convenience, and SQ through mobile check-in services, an AI-aided concierge service, an automated booking system, and other means [39]. When the potential users view these technologies as having a benefit they are highly likely to develop a positive intention of adopting them [10]. This is supported by TAM, which argues that PU is a determinant of BI [10]. This connection has been confirmed empirically in various industries and it should be pointed out that customer's belief in the utility of the technology greatly influences their readiness to use it [40,41]. Moreover, the more the technology improves speed, reliability, and customer satisfaction, the more useful it becomes, hence the more likely to adopt it in any environment where they really matter [42]. As such, PU is a cognitive construct that logically motivates people when making behavioral decisions about using smart technologies.

H1. *PU has a positive effect on BI to adopting smart technologies*.

3.2. Relationship between PEOU and BI

PEOU is defined as the degree to which a person believes that using a certain technology will require minimal effort [4]. PEOU has traditionally been regarded as an antecedent of PU, as well as behavioral intention, in most TAMs [10]. Users are likely to construct positive intention to use a system if it is easy and simple for users to interact with customers because we, as humans, tend to relate easy accessibility to something positive [43]. As far as smart technologies applied in tourism and hospitality - mobile booking applications or smart check-ins - issues that minimize cognitive effort and perceived difficulties relate to ease of use, which increases the likelihood of adoption [41]. Research has also indicated that digital tool users more likely to adopt digital tools when

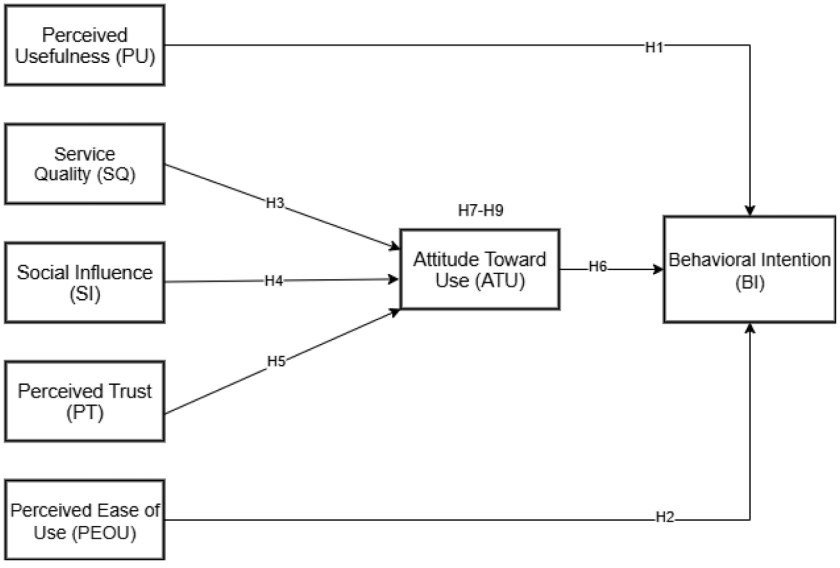

Fig. 1. Conceptual model.
Note: H1-H6 = Direct effects; H7-H9 = Mediating effects.

assured that minimal effort is needed to learn and use them competently [44]. Also, the ease of use will lead to user satisfaction and trust, which will support behavioral intentions [45]. Thus, usability design is another key aspect that determines the intention to use smart technologies in service industries.

H2. *PEOU has a positive effect on BI to adopt smart technologies.*

3.3. Relationship between SQ and ATU

SQ can be defined as the overall evaluation by users of how well a service meets their expectations, which can be determined by dimensions such as reliability, responsiveness, assurance, empathy, and tangibles [46]. When there are high levels of SQ particularly in services that use technology, there is a high likelihood that the positive emotional and cognitive reactions of the user to a particular type of service will strongly influence their ATU (ATU) [47]. In the case of the tourism and the hospitality industry, the users who have had a positive experience with digital services (e.g., the online booking platforms, AI-based check-ins) tend to show a more favorable attitude toward adopting the technologies [48]. The SQ can also be used as a proxy towards perceived performance and satisfaction, which increases the perception that using the technology is beneficial and enjoyable [49]. Research has found that the SQ is closely related to the attitude of customers when using digital services, that is, the customer will directly evaluate the quality of services through his or her attitudes [50]. Thus, high-quality service encourages positive user perceptions and promotes favorable attitudes toward technology adoption.

H3. *SQ has a positive effect on ATU.*

3.4. Relationship between SI and ATU

SI is the degree to which a person perceives that important others (family, friends, colleagues, or societal norms) think they should use a given technology [13]. Among the drivers of smart technology use in the hospitality and tourism setting it is possible to identify the user attitudes that are often influenced by peer pressure, social media trends, and shared experiences [51]. Trusted referent endorsement/positive speaking, on the other hand, increases the likelihood of people having a favorable ATU because they feel socially validated by those who are trusted [52]. In the UTAUT theory, SI is a determinant of BI and exerts an indirect impact on attitude via normative pressure (and, to some degree, identification with influential groups) [13]. In addition, SI is even more crucial in constructions of user perceptions and attitudes in collectivist cultures around the world (including many countries of Asian region and developing nations) [53]. Consequently, widespread adoption and advocacy of smart technologies can enhance users' positive attitudes toward their use.

H4. *SI has a positive effect on ATU*

3.5. The mediating role of attitude toward use (ATU)

ATU mainly mediates the effect of key antecedents (SQ, SI, and PT) on customers' BI to adopt smart technologies in tourism and hospitality. This implies that these factors affect BI both directly and indirectly via ATU.

In a technology adoption model, ATU is an essential mediator between exogenous factors (such as PU, SI, and PT) and BI. Attitude reflects the positive or negative emotional response toward performing a particular behavior, such as adopting a smart technology. It is shaped by beliefs such as perceived usefulness, trust, and SI [54,55]. The beliefs held by users that a technology has to be positive, reliable, and socially confirmed leads to a positive attitude that will subsequently have a great effect toward their intention to use the technology [10,12]. Some papers address the mediating role of ATU when explaining behavioral intention. For example, Pavlou [56] and Al-Gahtani [57] demonstrate that trust and social norms influence intention via attitude. Similarly, attitude has been observed to mediate the effect of the core beliefs, such as PU and system quality on intention to adopt smart services [42].

H7. *ATU mediates the relationship between PU and BI.*

The attitude is probable to be positive as a result of the PU of the smart technology thus inducing behavioral intentions of the users towards improvement. This indirect path illustrates how cognitive evaluations are internalized and lead to intention [12,58].

H8. *ATU mediates the relationship between SI and BI.*

The attitude is regulated based on social norms and peer expectations, which further influence intention. People are even capable of changing their attitudes to become in the same line with referents of influence before establishing behavioral intentions [54,13].

H9. *ATU mediates the relationship between PT and BI.*

The trust increases the probability of forming a positive ATU of smart technologies that consequently result in the increase of behavioral intention. Attitude formation through trust influences adoption intentions; when users trust a system they are less fearful and more willing to adopt it [5,56].

3.6. Relationship between PT and ATU

PT is the belief that a technology or service provider will behave reliably, securely, and in the users' best interest [59]. Trust relieves doubt and perceived risk, thereby enabling the user to develop a positive ATU [5]. The more users believe that a smart system, including an AI concierge or online booking platform, will meet their expectations and protect their data, the more positive their attitudes toward using it will be [60]. The issue of trust is of extreme importance where customers must provide personal or financial details, as is common in digital services in tourism and hospitality [61]. Empirical studies have shown that PT has a substantial positive effect on users' attitudes toward technologies and is key determinant of adoption [62]. Moreover, trust increases the psychological preparedness of users to use new technologies especially where there is limited direct exposure. Therefore, greater trust in the system or provider will foster more positive attitudes toward adopting smart technologies.

H5. *PT has a positive effect on ATU.*

3.7. Relationship between ATU and BI

ATU is a person's positive or negative evaluation of performing a specific behavior in this context, using smart technologies [54]. In both TAM and the Theory of Planned Behavior (TPB), ATU is a direct determinant of Behavior Intention (BI) [4,13]. When users develop a positive attitude based on perceived usefulness, trust and ease of use, they are more likely to intend to adopt the technology [63]. A favorable perception of smart systems in hospitality and tourism sphere of activity is the determination of a more positive behavioral intention to use such systems on a regular basis [41]. Attitude acts as a cognitive-affective filter that influence motivation to perform the behavior [64]. It has continually been established that attitude is one of the factors that affect BI in multiple industries and it is an integral part of the adoption models [44]. As such, the positive attitude of the users toward technology is an opportunity that should be considered as a leveraging point in achieving smart technology adoption.

H6. *ATU has a positive effect on BI.*

4. Research methodology

4.1. Sampling and procedure

The research involved a deductive research paradigm and the use of a quantitative research methodology to achieve the research objectives and enable generalizations about the behavior and attitude [65]. Convenience sampling was employed to obtain information. This non-probability technique was selected due to the challenges of accessing a national sample in an emerging economy like Bangladesh. Respondents were required to be Bangladeshi nationals and have to experience using smart technology applications such as ICT, IoT, mobile apps, AI, or AR/VR during travel. Therefore, respondents were chosen using a convenience sample, and participants had varied professional backgrounds.

We used Google forms to administer a web-based survey on the use of smart technology applications for travel planning in Bangladesh. The questionnaire was self-administered online and was conducted from January 2025 to May 2025. Participants were recruited via social media platforms (Facebook, LinkedIn, travel forums) and email invitations; respondents were encouraged to share the survey link with peers. Specifically, the questionnaire took an average of eight minutes to complete. Using this convenience sampling strategy, 358 questionnaires were distributed; 327 were clean, complete and had no missing value. However, 31 did not leave any responses to the questionnaire as they were not usable or were outliers. Finally, 327 responses were retained for analysis as valid.

The study aimed to investigate the psychological motivators for individual adoption smart technologies and to share their experiences with friends and associates.

4.2. Measurement scale

All measures used to quantify constructs were adopted from earlier literature. Respondents' responses were measured using a five-point Likert scale (Strongly Disagree = 1; Disagree = 2; Neutral = 3; Agree = 4; and Strongly Agree = 5). All the items were positively worded statements to facilitate meaningful analysis [66]. A pilot study was conducted with a sample size of 30 respondents. The initial analysis confirmed high reliability (Cronbach's alpha > 0.70) for all scales. Based on pilot feedback, minor wording adjustments were made to ensure clarity and cultural appropriateness, particularly in items related to PT.

4.3. Measurement variables

Independent Variables: The questionnaire was designed to capture prior knowledge and motivational aspects representing the main factors that influence use of smart technology applications in travel planning. To align with the research aims and model, some background items were modified; therefore, certain general tourism topics were omitted as they were not relevant. Items were selected based on a literature review. The five statements concerning PU were measured on the basis of various studies [45,67]. PEOU was measured with five items adapted from [45, 67]. SI was measured with five items adapted from [68,69]. SQ was measured with five items based on Abu-Taieh et al. [68] and Su et al. [70]. All statements were modified for this research.

Behavioral Intention (dependent variable) was measured using five items adapted from previous research. These items assess respondents' interest and willingness to use smart technology applications in the tourism and hospitality sector in Bangladesh for future travel planning [67,71,72].

4.4. Overview of analysis

Data were analyzed using IBM SPSS Statistics (version 25.0) primarily for descriptive statistics, while the measurement model and structural model were analyzed using Smart PLS (version 4.0), following the PLS-SEM approach. Analyses included reliability testing, confirmatory factor analysis and structural equation modeling (SEM) analysis. First, reliability and internal consistency (Cronbach's alpha) of the constructs were assessed. The second step was confirmatory factor analysis to assess adequacy.

The data analysis methods included descriptive statistics, measurement model validation, and structural equation modeling (PLS-SEM). Respondents characteristics were described using descriptive statistics (e.g., age distribution). CFA was employed to assess model fit and to evaluate the validity and reliability of the constructs. A factor loading greater than 0.70 indicated adequate representation of the construct [73]. The relationships between the discussed constructs in the proposed model, such as PU, PEOU, SI, SQ, PT, ATU and BI were explored by means of SEM. Similar to the Confirmatory Factor Analysis (CFA), the PLS-SEM analysis employed key model fit statistics, including the SRMR (Standardized Root Mean Square Residual) and NFI (Normed Fit Index), to determine the overall pattern of the model with construct relationships.

Reliability and validity were also assessed via convergent validity, discriminant validity, and composite reliability (threshold = 0.70) [73].

5. Results

5.1. Demographic information

The primary data were collected through a structured questionnaire administered to 358 participants. The participants were composed of 61.5 % males and 37.2 % females, which means that the large proportions of genders were male and less proportion of were female. Most of the respondent's age bracket was 25–34 (45.3percent), 18–24 (41.1percent), and 35–44 (11.2percent). Below 18(1.7 percent) and 45–54(0.8 percent). No one was 55+. This means that age groups are not significantly engaged to travel. The largest number of respondents was the bachelor's student (60.6 %), Masters (34.9 %), Higher Secondary Certificate (3.9 %), Doctorates (0.6 %) and none of the students were the Secondary School Certificate. Relative to use smart technology in tourism and hospitality 44.1 percent of the respondents are used to travel once in a year, 36.3 percent 2–3 times a year, 14 percent rarely and 5.6 percent more than three times a year. Table 1 presents the overall demographic information.

The aim of establishing that the data can be used in factor analysis is to use the Kaiser-Meyer-Olkin statistical test in factor analysis. KMO will

Table 1
Demographic profile of respondents.

Variables	Details	Frequency	Percentage
Gender	Male	220	61.5 %
	Female	133	37.2 %
Age	Below 18	6	1.7 %
	18–24	147	41.1 %
	25–34	162	45.3 %
	35–44	40	11.2 %
	45–54	3	0.8 %
	55+	0	0 %
Level of Education	Secondary School Certificate	0	0 %
	Higher Secondary Certificate	14	3.9 %
	Bachelors	217	60.6 %
	Masters	125	34.9 %
	Doctorates	2	0.6 %
Frequency of Tourism Activities	Once in a year	158	44.1 %
	2–3 times a year	130	36.3 %
	more than three times a year	20	5.6 %
	Rarely	50	14 %

Source: Survey Result.

determine the overall sufficiency of the sample within the model and will determine the quality of individual variables observed. The correlation of the variables enables one to calculate KMO (Table 2). The value will lie between 0 and 1 and the values that are close to 1 indicate that the variables are correlated and the factor analysis is good fit of such differing data; the variables that are not correlated with each other may not share a common beneficial factor. The KMO values have the following meaning; 0.90 or more -marvelous; 0.80–0.89 -meritorious; 0.70–0.79 -middling; 0.60–0.69 -mediocre; 0.50–0.59 - miserable; and below 0.50 - unacceptable as Kaiser [74] explains.

5.2. Common method bias (CMB) and multi-collinearity test

Multicollinearity and Common Method Bias (CMB) were rigorously assessed using the Variance Inflation Factor (VIF), as this is the primary check in the PLS-SEM methodology. Based on Table 3, none of the VIF values equal or exceed 3.3, which is deemed to be acceptable [75]. In addition to this, the values are also much below the general cut-off point of 10, further establishing the fact that the multicollinearity and CMB are quite innocuous in this research. This means that since the value is less than the widely regarded minimum of 50 %, it indicates that the CMB is not a big problem [76]. Moreover, CMB was evaluated on the basis of the variance inflation factor (VIF). Based on Table 3, none of the VIF values equal or exceed 3.3, which is deemed to be acceptable [75]. In addition to this, the values are also much below the general cut-off point of 10 further establishing the fact that the multicollinearity and CMB are quite innocuous in this research.

5.3. Reliability and validity of construct

Measurement model was validated with the help of convergent and discriminant validity thus determining the accuracy of the measurement model. Hair et al. [73] suggest that it is important to understand the historical role of neorealism in the formation of the theory. As Hair et al. [73] declare, Convergent validity is how extensive the correlation among two items of gauge is with one more test gauging a similar construct. The discriminant validity of measure of a concept (the discriminant validity of a concept) provides that the measure is empirically distinguishable and that it can construct the related phenomena that are not accessible when measuring other constructs in a structural equation model [73]. The entire elements in this study were put to reflectivity; hence, it must have a high degree of relative percentage of overall variance that is common to the indicators [73]. The measurement model is provided in Fig. 2. Table 4 depicts the calculation part of the reliability, (outer loadings), of the indicator, and the overall percentage variance, (AVE), and the individual reliability, (CR), to determine the convergent validity. The convergent validity could be seen because all the AVE levels were greater than 0.5 [73,77].

The reliability of the indicators then proceeded to maintenance through the aid of the composite reliability (CR) which ranks the indicators according to individual reliability of each indicator. The values of the composite reliability (CR) were acceptable and exceeded 0.7, which could be viewed as adequate, the reliability of the utilized measurements. Hair, et al. [73] further indicate that the determination of composite reliability relies on the individual indicators whereas, in the case of Cronbach's alpha, the reliability is identified in respect to the only inter-correlation within variable indicators. The correlations of latent variables with the square roots of the values of AVE were used to measure the discriminant validity [78,73]. The concepts were tested and their discriminant validity was satisfied by using the square root of the AVE of each concept as Table 4 indicates, with the resulting inter-correlations presented in Table 5.

Table 2
KMO and Bartlett's test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.906
Bartlett's Test of Sphericity	Approx. Chi-Square	6311.766
	df	596
	Sig.	.000

Source: SPSS results.

Table 3
Collinearity statistics (VIF).

Predictor Variable	VIF for ATU	VIF for BI
PU	1.374	1.387
PEOU	1.409	1.444
SI	1.278	1.326
PT	1.242	1.265
SQ	1.369	1.414
ATU	—	1.699

Source: SEM results.

5.4. Model fit

Model fit is how well a model is suited to the data that was observed. Henseler et al. [77] assert that the Standardized Root mean square residual (SRMR) is one of the most used model fit indicators in PLS-SEM. The indicator can be used to find out the misspecification of a model. This is due to SRMR value of <0.08 which is associated with good fit. This indicates a decent overall model fit as the SRMR is 0.065 which is <0.08. The saturated model is a perfect fit by definition, so no wonder the estimated model has d ULS d G a little higher. The NFI (0.842) falls slightly below the conventional threshold of 0.90 but is considered acceptable for PLS-SEM models in exploratory social science research and confirms the model's specified relationships are adequately represented by the data. The presented model fit statistics in Table 6 illustrate that the estimated PLS-SEM model will have good and acceptable fitness to the data. This conclusion is supported by the values of SRMR, NFI, in particular, and the minor deviations of d_ULS, d_G are natural and do not pose any issues.

5.5. Measurement model analysis

The Measurement model presents how six important constructs that impact the process of smart technology adoption in this tourism and hospitality industry of Bangladesh relate to each other. The highest predictor of BI was ATU (β=*0.312, $p < 0.001$*). This strong, positive standardized coefficient indicates that for every one standard deviation increase in ATU, BI increases by 0.312 standard deviations, demonstrating its substantial practical significance. SQ and SI are two variables that bear importantly on PU and ATU, and PT is one of the factors that influence the building of attitude. PEOU also helps PU but with less level of influence (0.125) on PU. ATU and (0.214) BI have good explanatory power which is based on their R^2 (0.243). All in all, the model affirms that, in addition to core TAM variables, external construct such as trust and SQ are pertinent influences of smart technology adoption behavior (Fig. 3).

5.6. Structural equation model (SEM) analysis

The structural equation model displays the associations between the six prominent constructs that mediate the effect on Behavioral Intention (BI) of using smart technology. The model also shows that, the following variables, that is, SQ, SI, PT, and PEOU are strong predictors of ATU and all their paths report strong statistical significance ($p = 0.000$ or 0.005) (Table 8). The PU and the ATU on the other hand, play a significant role in defining the BI as denoted by PU BI ($p = 0.014$) and ATU BI ($p = 0.000$). The perception, the users hold on usefulness and their attitudes are therefore major determinants of their intention to use the technology. Individually, the relationship between PEOU and BI ($p = 0.073$) is significant but only slightly and therefore shows the chance of having an

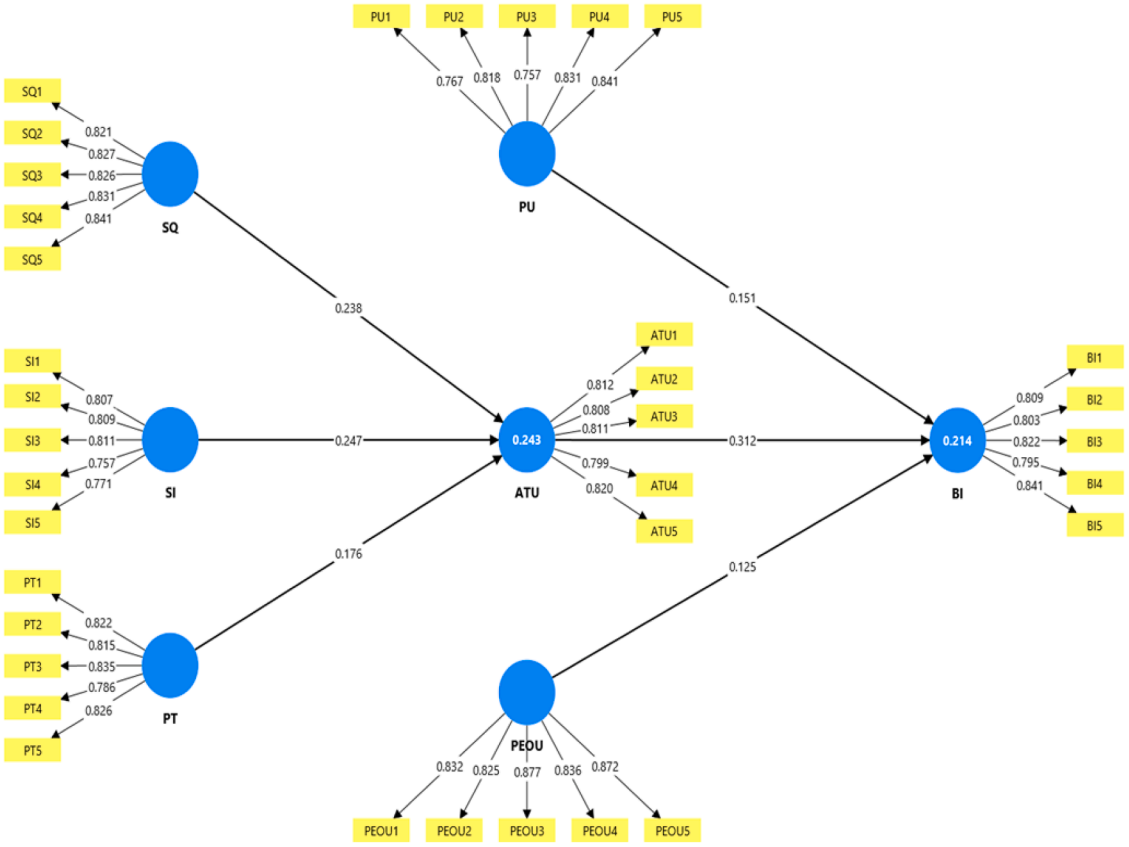

Fig. 2. Measurement model results.

effect.

The model explains 24.3 % of the variance in ATU and 21.4 % of the variance in BI. Methodologically, in social science research, an R^2 as low as 0.10 is considered acceptable when key predictors are statistically significant, with the primary goal being to validate relationships rather than maximize prediction [79]. In behavioral intention research specifically, such R^2 values are recognized as providing satisfactory explanatory power and nomological validity, particularly in exploratory studies within novel contexts [80]. This aligns with established empirical benchmarks in information systems and tourism, where, for instance, an R^2 of 0.250 for behavioral intention is cited as indicative of a substantive model [81]. Our model's R^2 of 0.214 substantially exceeds the general social science threshold and approaches this field-specific benchmark, while all hypothesized paths for key drivers (PU, ATU, PT, SQ, SI) are statistically significant. Therefore, the model demonstrates effective explanatory power for a pioneering study. The remaining unexplained variance appropriately suggests that additional context-specific factors (e.g., facilitating conditions, price value) may be integrated in future research to build upon this foundational model.

The discriminant validity is affirmed with inter correlation between constructs of 0.287–0.645 that all fell below 0.85 (Table 7) [82]. ATU and Customer Satisfaction (CS) are keyword in with 0.645, ATU and BI have 0.564 and customer satisfaction (CS) and BI of 0.55. PU shows a moderately positive correlation with CS in the form of 0.498, BI 0.411, ATU 0.481 and a slightly lesser magnitude of correlation with PEOU of 0.287. The values of correlation among PEOU and ATU, BI and CS are: 0.394, 0.375, and 0.436 accordingly. SL is positively and rather strongly correlated with CS (0.456), AT (0.436), PU (0.424), BI (0.395) and PEOU (0.346). All these values indicate that all constructs are empirically different hence discriminant validity of the model.

6. Discussion

6.1. Interpretation of findings

This study was conducted to create a conceptual model that combined TAM model variables with six other latent variables, such as PU, Perceived Ease of use, Social Influence, Service Quality, Perceived Trust and Behavioral Intention to examine influential factors that would lead to a better understanding of thriving responsible workforce in smart technology adoption, which concerns factors influencing smart technology adoption in Bangladesh tourism and hospitality industry. The aim of this research was to investigate the variables that contribute to the adoption of smart technology in the tourism and hospitality industry of Bangladesh using an extended TAM. The variables which were used in the model included the following: PEOU, PU, ATU, BI, PT, SI, and SQ. The results from the structural model provided information about the direct and indirect (mediated) links among variables.

ATU of smart technologies was identified as having a significant impact on behavioral intention ($\beta = 0.312$, $p < 0.001$), therefore confirming H1. This result is in line with the TAM model [4] which assumes attitude is a strong predictor of behavior intention. The result indicates that users with a positive attitude toward technology are more likely to use it in the professional environment [10]. The direct influence of PEOU on BI was not significant ($p = 0.073$), which is why H2 has been rejected. It clashes with some of the previous studies (e.g., [13]). The non-significant direct path from PEOU to BI ($p = 0.073$) suggests that user effort is not a decisive adoption factor. This implies that Bangladeshi smart technology users possess sufficient digital literacy that PEOU acts as an expected hygiene factor rather than a key determinant of adoption intention. This finding aligns with trends in other emerging economies. PEOU, PU, PT and the ATU had a significant positive correlation ($\beta = 0.176$, $p = 0.005$), supporting H3. This indicates the

Table 4
Reliability and validity of construct.

Variables	Items	Loading	Cronbach's Alpha (α)	CR	AVE
PU	PU1	0.767	0.864	0.901	0.645
	PU2	0.818			
	PU3	0.757			
	PU4	0.831			
	PU5	0.841			
PEOU	PEOU1	0.832	0.903	0.928	0.721
	PEOU2	0.825			
	PEOU3	0.877			
	PEOU4	0.836			
	PEOU5	0.872			
SI	SI1	0.807	0.851	0.893	0.626
	SI2	0.809			
	SI3	0.811			
	SI4	0.757			
	SI5	0.771			
PT	PT1	0.822	0.876	0.909	0.667
	PT2	0.815			
	PT3	0.835			
	PT4	0.786			
	PT5	0.826			
SQ	SQ1	0.821	0.887	0.917	0.688
	SQ2	0.827			
	SQ3	0.826			
	SQ4	0.831			
	SQ5	0.841			
ATU	ATU1	0.812	0.869	0.905	0.656
	ATU2	0.808			
	ATU3	0.811			
	ATU4	0.799			
	ATU5	0.820			
BI	BI1	0.809	0.873	0.908	0.663
	BI2	0.803			
	BI3	0.822			
	BI4	0.795			
	BI5	0.841			

Source: SEM results.

importance of trust for online systems, especially in developing countries where users may be concerned about data protection and system reliability [5]. Trust helps generate a positive attitude by reducing uncertainty. PU had a significant effect on behavioral intention (H4; $\beta = 0.151$, $p = 0.014$). This supports earlier studies arguing that people adopt systems they believe will improve work performance [4]. Perceived advantages of smart technologies are a major driving force behind their implementation in the tourism sector, in where efficiencies and accuracy of information are of utmost importance.

H5 was supported; SI had a positive effect on attitude ($\beta = 0.247, p < 0.001$). This is consistent with Venkatesh et al. [13], who propose that peer pressure, organizational norms, and leadership expectations strongly influence users' perceptions. In a collectivist society such as Bangladesh, encouragement and advice from colleagues or supervisors may influence an individual's attitude toward innovation. The quality of service also had a strong effect on attitude ($\beta = 0.238$, $p < 0.001$), indicating that H6 was supported. This suggests that when smart systems are reliable, responsive, and user- friendly, they evoke positive emotional and cognitive evaluations by users. System performance quality increases user satisfaction and positive appraisal [46]. Mediation by attitude was supported: the indirect effect of trust on behavioral intention via attitude was significant ($\beta = 0.055$, $p = 0.046$). This suggests that trust primarily influences behavioral intention indirectly, through its effect on user attitudes. .

Therefore, policymakers and system designers should foster user trust to facility technology acceptance. Attitude's moderating effect on the relationship between SI and behavioral intention was significant ($\beta = 0.077$, $p = 0.006$). This means that peer and managerial influences do not directly change behavior but shape internal evaluations (attitudes). These attitudes then influence subsequent decisions. These results support the role of leadership and role modeling in technology diffusion [83]. The mediation of attitude between the SQ and behavioral intention was also significant ($\beta = 0.074$, $p = 0.008$), supporting H9 (Table 9). These results imply that positive user experiences with system features can improve users' attitudes, which in turn increases their intention to adopt the system. This align with literature highlighting the mediating role of user satisfaction (or attitude) on the success of systems [22].

6.2. Theoretical contributions

In this study, some external factors were included based on the TAM. PT, SQ, and SI were included and were found to have a significant effect on ATU, which in turns strongly affect BI. Although PU has a direct positive effect on BI, PEOU did not have a significant direct effect; this implies that ease of use is less important when users are already familiar with the technology. The study also finds that attitude mediates the effect of trust, SQ, and SI on users' behavioral intentions. These results support a contextualized extension TAM better fits developing-country contexts, such as Bangladesh's tourism industry. This research offers a more balanced and culturally grounded perspective on smart technology usage.

6.3. Managerial/practical implications

There are several practical implications of the current study that can be adopted by policymakers, technology developers, tech providers in the hospitality and tourism industry in Bangladesh, and organizational leaders who are interested in embracing the smart technologies within

Table 6
Model fit.

	Saturated model	Estimated model
SRMR	0.045	0.065
d ULS	1.298	2.680
d G	0.526	0.555
Chi-square	999.960	1035.394
NFI	0.848	0.842

Notes: SRMR (Standardized Root Mean Square Residual), d ULS (Degree of Unbiasedness of the Least Squares Estimator), d G (Bentler Comparative Fit Index) Chi square, NFI (Normed fit index).

Table 5
Mean, standard deviations, and correlations among variables.

Variables	Mean	SD	1	2	3	4	5	6	7
PU	4.33333	0.55569	1						
PEOU	4.35933	0.58654	0.428**	1					
SI	4.31498	0.57037	0.297**	0.391**	1				
PT	4.27217	0.63094	0.305**	0.298**	0.251**	1			
SQ	4.32966	0.57243	0.373**	0.358**	0.349**	0.389**	1		
ATU	4.36575	0.55056	0.315**	0.377**	0.374**	0.322**	0.387**	1	
BI	4.40428	0.54905	0.286**	0.300**	0.378**	0.350**	0.418**	0.406**	1

*Corelation is significant at the 0.01 level (1- tailed).
** Corelation is significant at the 0.01 level (1-tailed).

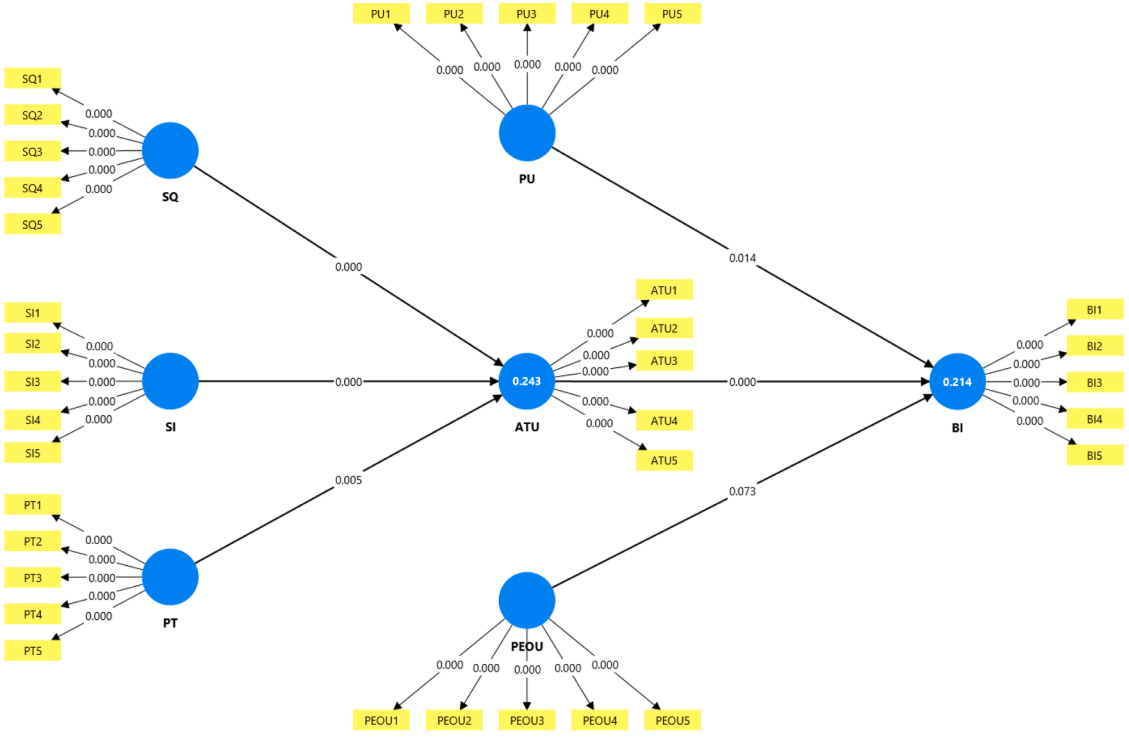

Fig. 3. Structural equation modeling results.

Table 8
Result of direct effect.

Hypothesis	Path	β	t-Statistics	p-value	Comment
H1	ATU → BI	0.312	4.143	0.000	Supported
H2	PEOU → BI	0.125	1.795	0.073	Not Supported ($p >$ 0.05)
H3	PT → ATU	0.176	2.810	0.005	Supported
H4	PU → BI	0.151	2.467	0.014	Supported
H5	SI → ATU	0.247	4.621	0.000	Supported
H6	SQ → ATU	0.238	4.466	0.000	Supported

Source: SEM results.

Table 7
Discriminant validity analysis.

	ATU	BI	CS	PEOU	PU	SI
ATU						
BI	0.564					
CS	0.645	0.550				
PEOU	0.394	0.375	0.436			
PU	0.481	0.411	0.498	0.287		
SI	0.436	0.395	0.456	0.346	0.424	

Source: SEM results.

the hospitality and tourism sector of the Bangladesh state. To render such implications more functional and operational, they are arranged below based on the main stakeholder groups.

6.3.1. *Implications for tourism service providers and organizational leaders*

The observations of this paper give some valuable lessons to tourism service providers and organizational leaders aiming to support the process of smart technology adoption. ATU has turned out to be a significant predictor of Behavioral Intention (BI), so tourism organizations are forced to focus on the approaches that can contribute to the development of positive perceptions by users. This could be done through creating awareness of the advantages of smart systems, providing a chance to use them on a trial basis, and showing how these technologies improve the efficiency of services and better performance of operations. The high role of PU also implies that smart technologies are to be designed and introduced to satisfy certain user requirements and simplify the working process. These benefits can be communicated by organizing demonstrations and special training programs, which would increase the confidence of users and promote greater acceptance. Though PEOU is not a direct determinant of BI, its indirect influence via attitude and usefulness presents the necessity to make sure that systems are made user-friendly, simple to use, and helpful even with staff of different levels of technological skill.

6.3.2. *Implications for technology developers and vendors*

The high impact of the PT on ATU reveals the essential role in the provision of the safety, privacy, and credibility of the smart technologies. The developers and vendors should therefore ensure that powerful data protection systems are put in place and that there is clear and

Table 9
Results of the mediation effect.

Hypo-thesis	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistics	P-values	Comment
H7	PT → ATU → BI	0.055	0.055	0.028	1.994	0.046	Supported ($p < 0.05$)
H8	SI → ATU → BI	0.077	0.076	0.028	2.736	0.006	Supported ($p < 0.01$)
H9	SQ → ATU → BI	0.074	0.072	0.028	2.673	0.008	Supported ($p < 0.01$)

Source: SEM results.

transparent information concerning the privacy protection. The adherence to international standards of data security may increase the level of user confidence, as well as reduce adoption objections. Moreover, the fact that SQ (SQ) has a positive impact on attitude suggests that the technical performance of smart systems cannot be compromised, as reliability, responsiveness, and stability should always be ensured. Technology providers are supposed to make sure that systems are optimally supported and have fast troubleshooting, up-to-date systems, and are dependable. The simplifying process with causes and effects of usability needs to be improved to cater to the comfort of the user and enhance acceptance, especially in the less technologically literate staff.

6.3.3. Implications for policymakers and national digital strategy

The significant and confirmed mediating role of ATU among PT, SI, SQ, and BI indicates that more institutional and policy-based interventions can have considerable value in increasing user readiness to adopt smart technology. Some of the ways that policymakers can contribute to this process include the enhancement of the national digital infrastructure and the establishment of programs that can enhance digital literacy levels among the tourism workforce. Government incentives -subsidies and grants or tax credits for tourism organizations that adopt smart technologies can further induce adoption. With that, creating detailed data protection policies and visibly apparent cyber security standards may boost confidence in users, providing scaled-down and more dependable cyber security conditions under the usage of smart technologies. Training programs at both the national and local levels, building capacity and regulation, could thus be instrumental in supporting the proliferation of smart technologies in the tourism and hospitality industry in Bangladesh.

7. Limitations and future directions

7.1. Limitations

While the model's explanatory power ($R^2 = 0.214$ for BI) meets methodological thresholds for exploratory social science research [79] and aligns with field-specific benchmarks, it indicates that other influential factors relevant to the Bangladeshi context remain to be explored in future studies to enhance predictive accuracy. The data used in this study was collected at a single point of time; thus, restricting the capacity to infer a causal relationship. Perspectives and behavioral intentions of users can be modified over time when using in smart technologies or acquiring more experience. This research study was restricted to the tourism and hospitality sector in Bangladesh. Although such a focus will help to improve the contextual relevance, it has limitations regarding the generalizability of its findings to other sectors or countries that have different cultural, technological, or infrastructural settings. Self-administered questionnaires can introduce common method bias and social desirability bias where the respondents will exaggerate their good motives/intentions or favorable experiences in the adoption of technology. This paper has augmented the original TAM by incorporating PT, SQ and SI, yet other potentially influential variables that have proven to be significant in technology adoption have not been noted, such as technological readiness, organizational readiness, perceived risk or the training and experiences of users. The PEOU fails to show a significant correlation with BI within the traditional TAM framework. Although this presents a new understanding, it can also reflect the fact that the relationship needs further investigation, and possibly requires qualitative research.

7.2. Future research directions

Considering the above limitations, several future research possibilities emerge. Future research is needed to adopt longitudinal designs to follow the evolution of user perceptions, attitudes and intentions over a long time span, particularly after system implementation and its use. The recommendations to make the extended TAM model even more generalizable include studying the adoption behavior of other industries (e.g., healthcare, education and other sectors in the field of public services) and cultural contexts (e.g., research the patterns of use of urban or rural populations, developing and developed countries). In the investigation, the model can be expanded by incorporating elements of other theoretical approaches such as UTAUT, Diffusion of Innovation (DOI), and Expectation-Confirmation Model (ECM). The explanatory power can be enhanced by the introduction of perceived risk, cost-effectiveness, the presence of conditions contributing to it and digital literacy. Using quantitative methods (e.g. SEM) alongside qualitative techniques (e.g. in-depth interviews or focus groups) can reveal underlying user motivations, barriers, and nuanced behavioral drivers which cannot be captured through a structured questionnaire. Studies can be conducted in the future studies can examine demographic moderation of the relationships of the model's relationships using variables such as age, gender, education, occupational status, or digital status. Additionally, Future research should integrate additional constructs identified as relevant to the Bangladeshi context such as Facilitating Conditions, Price Value, and Perceived Risk to develop a more comprehensive model with enhanced predictive power. This would help in the preparation of adoption mechanisms based on intended users in the industry. It could be even more valuable to examine user acceptance based on specific types of smart technologies (e.g., smart booking systems, AI-based customer service tools, or contactless check-in systems) rather than general adoption.

Declaration of generative AI

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) to improve language clarity and readability. The authors take full responsibility for the content of the publication.

CRediT authorship contribution statement

Mst Tanzil Jahan Shampa: Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Md. Shakhawat Hossain:** Writing – review & editing, Validation, Supervision, Project administration, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix-1. Questionnires

Construct		Items	Sources
SQ	SQ1	The service quality I receive from Smart technology is excellent.	[68,70]
	SQ2	I am very pleased with the service I receive from Smart technology.	
	SQ3	Smart technology provides high-quality service.	

(*continued on next page*)

(*continued*)

Construct		Items	Sources
	SQ4	The smart technology service providers were knowledgeable about the device and services offered.	
	SQ5	Overall, I was satisfied with my used smart technology service Compared to my expectations.	
SI	SI1	People who are important to me think that I should use Smart technology for visiting hotel.	[69,68]
	SI2	People whose opinions I value prefer that I use Smart technology for visiting hotel.	
	SI3	Listening to the media influence's the use of smart technology in hotel I used.	
	SI4	People who influence my behavior think that I should use Smart technology for visiting hotel in tourist place in BD.	
	SI5	People who have an impact on my behavior believe that I should use Smart technology in hotel.	
PT	PT1	The service offered by the smart technology was reliable.	[84–86]
	PT2	The smart technology provided good and convenient facilities for tourists.	
	PT3	The smart technology service had a customized and transparent pricing policy.	
	PT4	I trust the information from smart technology in tourism platforms.	
	PT5	If I was to discuss this smart technology service with others, I would obviously say positive things	
PEOU	PEOU1	The interaction with the smart hotel applications is clear and understandable.	[45,67]
	PEOU2	The interaction with the smart technology service does not require much effort.	
	PEOU3	I find the smart technology service easy to use.	
	PEOU4	I find it easy to access the desired information through the smart technology service.	
	PEOU5	Learning to operate smart technology is easy for me	
Perceived Usefulness (PU)	PU1	The smart technology service makes the tour useful.	[45,67]
	PU2	The use of smart technology service is an effective way to travel in Bangladeshi tourist place.	
	PU3	I use the smart technology service to get better access to information to visit tourist place in Bangladesh.	
	PU4	Using smart technology enhances my tour more effective.	
	PU5	Overall, I find using the smart technology service is useful	
ATU	ATU1	I think, using smart technology service will facilitate me to make decision about tour planning.	[87],
	ATU2	I like the concept of using smart technology as a tool for influencing travel intentions and decisions.	
	ATU3	I have a positive attitude toward smart technology service.	
	ATU4	I believe that smart technology services enable me to accomplish tasks more quickly.	
	ATU5	In my opinion, smart technology service will make me more comfortable to make decision about tour planning.	
BI	BI1	I am willing to get at smart technology service when traveling.	[72,71,67])
	BI2	I will make an effort to embracing smart technology to enhance my travel experiences.	
	BI3	I would encourage others to adopt smart technology to enhance their tour experiences.	
	BI4	I plan to adopt smart technology during my tours as soon as it becomes accessible to me.	
	BI5	I frequently utilize smart technology with my friends and family to simplify and improve tour management.	

Data availability

Data will be made available on request.

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