

# Smart Technology and its Influencing Factors in Room Division Department of Selected Five Star Hotels of National Capital Region (NCR), India

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**Abstract** *This study investigates the different smart technology applications used in hotels and factors influencing the adoption of smart technology in the hotel industry, specifically in India, a developing country. The objective of this study is to identify the use of various smart technologies and the factors that influence the adoption of these technologies in five star hotels of Delhi NCR, India. For this aim, a questionnaire was developed and sent to the general managers of hotels in Delhi NCR, India, to collect data and verify the research hypotheses. A sample size of 300 hotels was used. The smart technology adoption in the current study presented through the existence and operational use of 26 different smart technology applications in room division department in selected five star hotels in NCR of India. From the descriptive analysis, it is assessed that 18 smart technology variables with high perception mean (more than 3.5) indicating regular use of smart technology applications. For accomplishment of second research question, research contains 12 independent variables under three broad categories – technological factors, organizational factors and environmental factors. The results of data using regression analysis indicate that technology infrastructure, compatibility, relative advantage, top management support, and social influence are important determinants of adoption.*

**Keywords:** *Smart Technologies, Adoption Factors, Hotel Industry, Developing Countries*

## INTRODUCTION

In the modern era adoption of digital technology within the hospitality industry is increasing rapidly. Further, advancement in information and communication technology allows different hotels to carry out operations smoothly and, in turn, contributes a lot to the development of the businesses in the market. The reason behind increasing use can discover as the rational behavior of customers who strive forward to specialized, versatile, open, and engaging goods and services through leadership is justified (World Economic Forum, 2016).

The information & communication technology (ICT) after its amalgamation with internet technology transformed in

to, ‘Smart Technology’ that proliferated the business process efficiency (Walker, 2010; Cooper et al., 2013). Hence, hospitality business is expected to elevate the application of smart technology to achieve customer service excellence (Al Ghamdi, 2012).

Mainly, the hotels operating in the developing market are highly benefitted by adopting new and advanced technologies and contributing a lot to the overall success (Foerster-Metz, et al. 2018). This phenomenon also considered by researchers from the Indian perspective (Sintala, 2019; Kumar et al., 2020) and assessed that the use of technology has shifted to 4.0 in the age of the internet and adoptions of smart technologies tremendously adopted by different hospitality

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firms in order to ensure innovating and efficient customer services particularly room division operations of a hotel. The dynamic technology also indicated rising numbers of hotels adopting different business operations shortly. Whereas from different sides, when employees of the firm are unable to adopt the latest tools quickly, it is the most challenging task for the firm to carry out operations smoothly, and it acts as one of the biggest hurdles in front of the management sustain in the market. It can be stated that various trends are present that linked with the new type of digital and smart technologies (Alwan, 2014; Chahal & Kumar, 2014).

Few researchers (Chauhan & Manhas, 2013; Wang, et al., 2014; Wang et al., 2015) noticed a rising acceleration of smart technology adoption in hotels in different business operations but also noticed that extent of its adoption in the organization is influenced by certain organizational and outside characteristics. According to Garg (2021) with reference to smart technology in Indian hotel sector, it is noticed that hotels plan to avail this technology for better operational efficiency. However, its application depends on certain factors such as diversity in available technologies, organizational and outside factors. So, from a more comprehensive approach, it is essential to investigate the crucial factors responsible for adoption of this emerging aspect.

But, in spite of rising progress of smart technology in hotel operations, the exploration from developing country like India found insufficient in literature. However, to some efforts has been noticed (Garg, 2021; Jaipuria & Aditya, 2021) to study the use of smart technology and information & communication technology (Venkatesh & Davis, 2000) that focus specifically on hoteliers' opinions, but fail to investigate the impact of different factors on its adoption in hotel. This left a room for undertaking this research and hence, specifically, current study investigates the smart technology application in room division department and factor responsible for adoption in selected five-star hotels in national capital region (NCR) of India as study region.

## Statement of the Problem

It has been seen from the comprehensive literature survey that there are studies on the application and use of smart technologies in different hotel services in the developed region of the world (Quarshie & Amenumey, 2018; Buhalis & Leung, 2018; Sharma & Bhat, 2022; Mahajan et al., 2015; Dalgic & Birdir, 2020; Sun et al., 2020; Kim & Ariza-Montes, 2021; Han et al., 2021). However, when it came to room division operations, particularly of 5-star hotels, the existing literature reported a research gap. Thus, it needs to recover to get a more precise understanding of smart technologies adoption in hospitality.

On the other hand, although the hospitality industry is also rising in developing countries like India, as far as application and adoption of smart technologies is a concerning scarcity of literature identified by the current researcher with exception to few studies (Chahal & Kumar, 2014; Sintala, 2019; Kumar et al., 2020). These studies ignore the room division operations' association to smart technologies in 5-star hotels. Therefore, the current researcher noticed this absence of proper consideration from the Indian scenario as another research gap, and hence, it led to conduct a meaningful study to fill this gap. Based upon the overview of the foundation discussed above, the following are the research objectives:

To examine the use and application of smart technologies in room division operations of selected 5-star hotels.

To identify the factors that lead to smart technologies adoption in the room division operations of selected 5-star hotels.

## REVIEW OF LITERATURE

### Smart Technology and Hospitality

The hospitality business is a dynamic service sector and thus requires a strong communication system empowered by technological innovation (Wang et al., 2015; Ho, Lin & Chen, 2012). The hotel industry therefore, performing different operational activities supported by smart technology such as website, email, social media, global distribution system, property management, CRM, smartphone and tablet support ubiquitous computing, connectivity to the Internet, and the integration of various sensors (Morosan, 2014; Wang et al., 2015). The portable nature of smart technology have led hotels in information needs, decision making, guest-experiences, documenting and sharing (Dickinson et al., 2014; Lamsfus et al., 2014), Researchers (such as, Adukaite et al., 2013) discovered that smart technology applications offered by hotels are based on content and used to perform functions such as front desk operations, housekeeping activities, food & beverage and restaurant management system including essential business operations such as sales & marketing, accounting and human resource management system.

### Smart Technology in Room Division Department of Hotel

In room division operations, computers can be termed as among the most common tools underneath smart technologies used in hotels. Apart from this, digital cameras, projectors, tablets, etc., are some other common tools that are being considered to conduct out a smooth flow of

information while functioning specifically for room division (Quarshie & Amenumey, 2018). As per the view of Quarshie and Amenumey (2018) the rooms division comprises the respective units: front office, reservation system, housekeeping, receptionist, safety, as well as communication systems for guest services and the technological tools including Machine Controlled Learning as well as Computer Driven Instruction are being used to coordinate guest info, occupancy rates as well as vacancies as operational assets in 5-star hotels for room division.

On the other hand, Silva et al. (2019) stated that different software programs also being used by 5-star hotels for evaluating room occupancy information, store the information of guest, process any complaints, etc. that is an integral part of room division operations. Apart from this, Bahar et al. (2019) mentioned that there are now several smart technologies tools that commonly used for operations in the Room Division.

A study from Indian perspective (Jaipurian & Adity, 2021) discovered the use of smart technology in room division operations of hotels such as front desk and housekeeping has been rising and hence, the fusion of technology with hotel services, it is important to proactively incorporate smart technology into their room division operations to improve service quality.

## Factors Influencing Smart Technology Adoption

Muhammad Aftab Alam (2016) stated that various factors influence the integration of technology within a hotel, such as efficiency gets affected by the stress of the workforce regarding adapting new technology, management style, training of the workforce, working conditions, as well as external factors. It identified in the study that equity sensitivity and technology-related stresses are interlinked and affect employees' performance.

The use of smart technology in an organization is significantly influenced by the technological context. The technological context includes infrastructure, compatibility, competency, innovativeness and global interface. *Technological infrastructure*: The hardware, software, network resources, data centres, facilities, and other resources needed for the management and operation of an information technology (IT) enterprise are collectively referred to as IT Infrastructure in the context of information technology. The majority of IT application initiatives have been delayed or failed because the necessary infrastructure was not in place. Because of this, the adoption of smart technologies now heavily depends on IT infrastructure.

*Innovativeness*: According to Kim et al. (2010) innovativeness influences organisations' willingness to

embrace new technologies and has a favorable impact on this behavior (Kim et al., 2010). The innovativeness of SMEs is anticipated to play a significant effect in the behavioral intention to use smart technology.

Another factor is *compatibility*, which referred as the "degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p. 240). The compatibility of the new and old systems has been identified in several earlier researches as a primary determinant of innovative uptake (Kendall et al., 2001; Thong, 1999). Furthermore, according to Lee (2004), company owner are more inclined to adopt smart technologies once they believe doing so will improve their company's status of operations.

*Technical Competency* is a representation of an organization's internal technology resources, according to Zhu et al. (2006). They define technology competence as being comprised of knowledge of the Internet and IT infrastructure. Additionally, businesses with greater technological competence seem to be more inclined to embrace internet business practices (Zhu et al., 2003).

*Global Interface*: In order to provide efficient connection between the hotel's property management system and its guest service systems, a very sophisticated collection of customizable software services called Hotelware Interface was developed. Nearly all major third-party supplier apps are controlled by the hotel ware interface module, which supports numerous of digital equipment for guest services (Theovauhs, 2022).

## Organizational Context

An essential factor with a significant influence on how technology adoption by enterprises is determined is the organizational context (Premkumar, 2003). It involves top management support, relative advantages, in-house awareness and expertise, dynamic business operations and staff commitment.

The support of top management is necessary for a business to successfully implement any technology (Wang & Shi, 2009). According to Premkumar and Roberts (1999), the top management in a company serves as a possible decision-making group. Lin (2014) discovered that top management support is positively associated with the plausibility of businesses adopting electronic supply chain management systems, while, Soliman and Janz (2004) found that top management support has a substantial impact on the adoption of Internet-based inter-organizational information systems.

*Relative Advantage*: is defined as "the degree to which an innovation is perceived as being better than the idea it supersedes" (Rogers, 2003, p. 229). The advantages and disadvantages that an organization will face depending on whether it adopts or rejects a technology are explained. Prior

research found that SMEs in poor nations like Saudi Arabia are highly influenced by relative advantages when deciding whether or not to use ICT (Grandon & Pearson, 2004).

*In-House Awareness and Expertise:* The adoption or rejection of technology by enterprises is significantly influenced by their IT knowledge, skills, and practices (Wainwright et al., 2005). The level of awareness and IT know-how available as a resource base for technology implementation is the level of knowledge and skills at hand. According to Davenport and Ronanki (2018), Oliviera et al. (2014), internal and external IT knowledge are the two types of competencies that must be present for the technology to be implemented effectively. In the literature on new technology adoption and innovation, this aspect is frequently cited as among the critical successful elements (Jukic, Jukic & Velasco, 2009). According to Hashim (2007), the ability of managers to adopt new technologies is directly related to their degree of in-house IT awareness.

*Dynamic Business Operations:* Organizational resources are becoming more portable and transportable across international boundaries because to globalisation and liberalisation initiatives (Todd & Javalgi, 2007). According to Ongori and Migiro (2010), the effects of globalisation have forced many SMEs to adopt technology in order to thrive in the current era of competition therefore, it was vital to put Technology at the frontline of their varied companies in order to adapt to new corporate environments.

*Staff Commitment:* The extent where a staff feels committed to their organization can be characterised as employee commitment, according to Akintayo (2010). Employee commitment was defined by Ongori (2007) as an emotional reaction to the entire organization and the level of engagement or devotion that individuals have to it. Companies benefit from important competitive benefits, like increased productivity and lower employee turnover, from employees who are invested in their jobs and loyal to their organizations. As a result, the literature, including AI, has identified staff commitment as a key component in the adoption of new technologies (Ransbotham et al., 2017).

## Environmental Context

Organizational adoption of smart technology is significantly influenced by the environmental context. Together with government support, it also incorporates social influence. The adoption of technology by an organization is influenced by a number of environmental factors, including the regulatory environment. According to the research, adoption of ICT is rather low among SMEs working in a setting where they are constrained by laws and other regulations (Dasgupta, Rajesh & Sethi, 1999).

*Social Influence:* The degree, to which people believe that significant others, such as family and friends, think they should utilize a certain technology, is referred to as social

influence (Venkatesh et al., 2012). It illustrates how much weight a person gives to other people's opinions about how they utilize technology as opposed to their own (Maruping et al., 2017). The behavioral desire to utilize digital payments technology is more strongly influenced by social factors than by convenience, utility, and enjoyment (Khalilzadeh et al., 2017). As a result, the social circle of a company's owner may affect their opinions of the value of IT and the rate at which it is adopted. In light of the aforementioned, a favorable association between social influence and organization adoption of smart technology is anticipated.

Therefore, since there are gaps on the literature and knowledge in the smart technology and its adoption, the researcher believes that this study is very timely in order to fill this specific gap and proposes the following hypotheses for testing.

*H1: The identified factor has significant influence on smart technology adoption in room division department of selected five star hotels in national capital region.*

## RESEARCH METHODOLOGY

This research problem has been studied using exploratory research designs. The study based on primary data collected from respondents using survey method. The current study confined to the national capital region (NCR) of India, and thus list of the five star hotels taken from the databases of Ministry of Tourism, Government of India (<https://www.nidhi.nic.in/MOT/RptHotel.aspx>) and Federation of Hotel & Restaurant Association of India ([https://www.fhrai.com/annual\\_report.aspx](https://www.fhrai.com/annual_report.aspx)). The study population represented by all the personnel of room division department of hotel including front office and housekeeping along with general manager working in the five-star hotels located in national capital region (NCR) in India. Primary data for the study has been collected for more than six month of period in intention to remove the seasonal biasness. Formal permission through email and over phone has obtained in advance from selected hotels to get acceptance of data collection by different stakeholders. The data for the collected through field bases survey and web survey using a convenient sampling technique after considering the knowledge and awareness about smart technology of selected participants. The study distributed 550 questionnaires covering at least 11 questionnaires to 50 selected hotels, but only 300 filled and returned the questionnaire with a good response rate of 54.55%.

The questionnaire was designed in three different parts, containing demographic (gender, age, residential status, marital status, academic qualification, position and department) in part one, 26 item statement of smart technology tools used in room division department in part two and finally 12 item statements of factors responsible for

adoption of smart technology in room division operations of selected five star hotels in part three. Part two and three of the questionnaire was designed by using a 5-point 'Likert-Scale' ranged between 1-5 ratings (1=strong disagreement, 2=disagreement, 3=neutral, 4=agreement, and 5=strong agreement). The survey instrument for the study was a self-administered as well as measures adopted from existing instruments. For self-administered questionnaire developed by researcher and validated in consultation with academicians and professionals in the field of hospitality and technology. The measures for the independent variables were developed from existing instruments like: three items for the technology competence and relative operational advantages are adopted from Premkumar and Roberts (1999), three items for technical competence are adopted from Wang et al. (2016), three items for innovativeness are adopted from Agarwal and Prasad (1998), three items for technological infrastructure taken from Dastane (2020), three items for top management support are adopted from Thong et al. (1996), three items for in-house awareness and IT-expertise adopted from Thong and Yap (1995), three measures for government support are taken from Ramsey and McCole (2005) and three items adopted for social influence adopted from Venkatesh and Davis (2000); Venkatesh et al. (2003). Rest of the variables like, Global interface, dynamic business operations and staff commitment concerning smart technology adoption in hotel industry were self developed. The gathered information from respondents was investigated using 'statistical package for social science' (SPSS) applying suitable statistical tools. Descriptive analysis (percent, average, and Std. dev.) was used for accomplishment of objectives. The study also used factor analysis technique by applying principal component analysis (PCA) to identify the adoption factor for smart technology. The inferential test (multiple regression analysis) was used for investigation of the study hypothesis. From the application of regression analysis, the study assesses the influence of; (i) independent variables (identified factors) on the dependent variable (smart technology adoption) in terms of selected five star hotels in NCR in India. For the prediction of goodness-of-fit of the regression model, the study examines the 'multiple correlation coefficients (R)', 'coefficient of determination ( $R^2$ )', and 'F ratio' in the study.

## RESULT OF THE STUDY

### Socio-Demographic Characteristics of Managers

The study noticed most of the respondents represented male community (63.50%) over female respondents (36.50%). In terms of age wise classification, the analysis detected largest group of respondents belongs to 31-40 years of age (33.33%) followed by 21-30 years group and 41-50 years group. The

respondent with age more than 50 years participated very less in the survey. While identifying respondents' residential status, the study interestingly noticed sufficient representation respondents belongs to NCR area (62.33%) with moderate number of respondents (37.67%) belongs to other areas of country. With regard to family status of respondents the study revealed half of the respondents were married (50.67%) whereas more than 1/3rd (35.33%) were unmarried. The remaining (14%) were belongs to single status including divorcee and others. The education level of respondents revealed most of the respondent with graduate degree (57.00%) followed by respondent having postgraduate or above education (30.33%). The remaining respondents were reported with diploma education (12.67%). This indicates most of the respondents were literate with sound educational background and thus having good understanding about technology. The respondents from different units of room division departments participated in survey. Thus, revealed 2/5th (40.67%) respondents from front office department followed by almost similar number of respondents (39%) from housekeeping department. The study also revealed representation top management i.e. general manager (20.33%) also participated in the survey. The detailed respondent's profiles in Table 1 given as follows:

**Table 1: Respondent's Profile**

Characteristics of Respondents	Frequency (n = 300)	%
<b>Gender</b>		
Male	190	63%
Female	110	37%
<b>Age Group</b>		
21-30	90	30%
31-40	100	33.33%
41-50	88	29.33%
Above 50	22	7.34%
<b>Residential Status</b>		
NCR Region	187	62.33%
Other Area	113	37.67%
<b>Marital Status</b>		
Married	152	50.67%
Unmarried	106	35.33%
Others	42	14%
<b>Education</b>		
Diploma	37	12.67%
Graduate	171	57%
Post-graduate	92	30.33%
<b>Department</b>		
Front office department	122	40.67%
Housekeeping department	117	39%
General Manager	61	20.33%

## Smart Technology Application in Room Division Department of Hotel

The smart technology adoption in the current study presented through the existence and operational use of 26 different smart technology applications in room division department in selected five star hotels in NCR of India. The respondents were asked to rate their perception on a 5-point Likert scale as discussed in research methodology section. The mean and standard deviation were computed to reflect the responses and, consequently, the participants' attitudes concerning each of the questionnaire's items. The standard deviation quantifies the dispersion and provides an index of the spread or variability in the data, whereas the mean displays the central tendency of the data (Sekaran & Bougie, 2013). To put it another way, a low standard deviation for a group of statistics shows that these levels are directly clustered around the mean or positioned close to it, whereas a big standard deviation shows the reverse. The following formula was used to calculate each item's level: (highest point on the 5-point likert to lowest point on the Likert scale) / the total number of levels employed =  $(5-1) / 5 = 0.80$ , where 1-1.80 represents "extremely lowest," 1.81-2.60 represents "low," 2.61-3.40 represents "modest," 3.41-4.20 represents "high," and 4.21-5 represents "extremely high." On the basis of their means, the items were then arranged. The outcomes are displayed in Table 2.

From the descriptive analysis, it is assessed that the perception of respondents were higher in case of most of the smart technology applications and very less number of applications reporting low perception. More comprehensively, the descriptive table reported 18 smart technology variables with high perception mean (more than 3.5) indicating regular use of smart technology applications. 4 out of total smart technology variables reported moderate level adoption (3.1 to 3.5 mean values) conveying frequent but not high level adoption in hotel room division operations. However, 4 smart technology variables were spotted with very low level of adoption (3 or lesser mean value) in selected hotels. The overall mean of smart technology application is also slides on higher side of measurement scale conveying increased intention among selected hotels to adopt smart technology in different room division operations of their respective hotels.

**Table 2: Smart Technology Adoption Level**

Smart Technology Application	Mean	Std. Dev.
Telephone and Fax System	4.57	0.833
Computer (Desktop & Laptops) System	4.43	0.913
Printer and Scanner System	4.39	0.922
Audio-Video Conference System	4.34	0.892
Voicemail Box Messaging System	4.00	0.998

Smart Technology Application	Mean	Std. Dev.
High Speed LAN & Wi-Fi Internet System	4.97	0.511
Website and Business Email Account	4.98	0.506
Social Media Platforms System (Facebook/Blog/Instagram/YouTube/Twitter)	4.80	0.657
Mobile Application and Smartphone System	3.98	0.872
Smart Wearable Technology System (Smart Watch/Wrist Band)	3.00	0.825
Electronic Point of Sale System	4.32	0.720
Global Distribution System	4.55	0.680
Property Management System	4.61	0.632
Customer Relationship Management System	4.00	0.880
Guest Accounting Management System	3.72	0.896
Room Status and Housekeeping Management System	3.33	0.970
Statistics and Reporting System	3.28	0.983
Digital Stock & Inventory and Procurement System	3.66	0.864
Digital Energy Management System	4.16	0.717
Technology Driven Room Management System	3.95	0.823
Artificial Intelligence System (Travel Assistant/Live Chatbots/Block Chain)	3.37	0.856
Internet of Things Based System (3 <sup>rd</sup> Party Integration/Predictive Maintenance/Hyper Personalization)	2.88	1.007
Virtual Reality System (3D Headsets/Glasses/Google Cardboard// Distance Calculator)	2.97	0.998
Augmented Reality System (Map /Gamification/Beacons/ Recognition/ Translation)	3.60	0.876
Electronic Lock and Security System	3.34	0.974
Cloud Storage and Big Data Analytics System	2.92	1.003

## Underlying Factors of Smart Technology Adoption in Selected Hotels

A factor analysis is conducted to get a better understanding of the underlying structure of the data and to create correlation variable composites from the original variables (Hair et al., 2010). Thus, in the present study used organization adoption factors items (15 smart technology adoption items) for factor analysis to identify the important and crucial factors. The identified factor with 'eigenvalue' above 1.0 was taken as significant one in the analysis. The factor solution reported good representation of more than sixty percent (63%) of the 'total variance'. The value is considered acceptable

as supported by previous literature (Hair et al., 2010). In line with the study of Hair et al. (2010), the variable items loaded with more than 0.4 score were considered for further analysis to constitute a factor through application of possible underlying dimensions and hence, 3 items that loaded with less value (below 0.4) were dropped and not considered for further analysis. For checking the appropriateness of factor analysis, the value of 'Kaiser-Meyer-Olkin (KMO = 0.857)' and 'Bartlett test of Sphericity (p = 0.002)' were calculated that resulted an acceptable value in both cases indicates appropriateness and factor analysis used on the data. The factor analysis resulted in to 3 factor solution representing 12 smart technology variables with explanation value of 63.10 of the total variance explained. In relation to testing 'reliability and internal consistency', a reliability analysis method through 'CronbachAlpha' was applied. The available literature (Kumar, 2018) mentioned the 'Cronbach's Alpha' value more than 0.7 were considered acceptance. The reliability analysis in the current study reported its value as 0.73-0.84 that seems on higher side of acceptance level. The factor identified from factor analysis was technological factor, organizational factor and environmental factor.

**Table 3: Factor Analysis for Influencing Smart Technology Adoption**

Items	Dimensions		
	Factor-1	Factor-2	Factor-3
<b>Technology Factor</b>			
Technology infrastructure in hotel	0.509		
Technical compatibility of hotel	0.498		
Technical competency of hotel	0.478		
Technical Innovation in hotel	0.450		
Technological global interface of hotel	0.435		
<b>Organizational Factor</b>			
Top Management Support		0.765	
In House awareness and Expertise		0.692	
Relative Operational Advantage		0.667	

Items	Dimensions		
	Factor-1	Factor-2	Factor-3
Dynamic business operations		0.576	
Staff Commitment		0.512	
<b>Environmental Factor</b>			
Social Influence			0.437
Government Support			0.421
Eigenvalue	4.615	2.773	1.954
Variance Explained	27.08	23.27	12.75
Cronbach's Alpha	0.841	0.801	0.734

## Multiple Regression Analysis

The three factor influencing adoption of smart technology in 5 star hotels are technological factor, organization factor and environment factor in the current study were taken in to consideration for knowing the influence on dependent factor (smart technology adoption in current study), a 'multiple regression' statistics was employed and thus findings produced as below.

**Table 4: Model Summary**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Standard Error of the Estimate
1	.856 <sup>a</sup>	.761	.740	5.307

a. Predictors: (Constant), Technology Factor, Organizational Factor, Environmental Factor

As shown in the model summary, the value of adjusted R<sup>2</sup> describes the fraction of variance in the dependent variable (smart technology adoption). Hence, the independent variables (technology factor, organizational factor and environment factor) contribution to the smart technology adoption is 74.0%.

## Anova Analysis

The study further assess a multiple regression analysis in case of all the three independent variables i.e. technology factor, organizational factor and environmental factor responsible for smart technology adoption. The findings presented as under.

**Table 5: Model Fitness for Factor Influencing Smart Technology Adoption**

ANOVA <sup>a</sup>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11252.267	3	2681.339	94.324	0.000 <sup>b</sup>
	Residual	1275.657	296	28.236		
	Total	12527.924	299			

a. 'Dependent Variable': Total Smart Technology Adoption in room division of selected five star hotels.

b. 'Predictors': (Constant), Technology Factor, Organizational Factor, Environmental Factor.

From the above table it can be ascertained that the, "value of F is found 'statistically significant'" and hence, it indicates the fitness and suitability of the applied model for this

investigation. However, more exploration, the findings of regression analysis also discussed below:

**Table 6: 'Regression Coefficients' of Factors Influence Smart Technology Adoption**

Coefficient <sup>s</sup>							
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Standard Error	Beta			Tolerance	VIF
(Constant)	11.034	5.513		2.158	.036		
Technology Factor	.293	.094	.94	3.081	.002	.251	3.726
Organizational Factor	2.430	1.342	.172	2.014	.040	.313	3.014
Environmental Factor	8.135	1.646	.423	4.583	.000	.300	3.221

a. 'Dependent Variable': Total Smart Technology adoption in room division department of selected five star hotels.

The 'regression analysis' has been established by using three influencing factor (technology, organizational and environmental) constant as null, smart technology adoption in room division department of selected five star hotels will be 11.034. Thus, the finding by considering all other 'independent factors' as zero, a percent increase in technology factor contribute to 0.293 percent rise in smart technology adoption in selected hotels, a percent rise in organizational factor will contribute 2.430 percent increase in smart technology adoption and a percent rise in environmental factor contributes 8.135 percent increase in smart technology adoption in room division department of selected five star hotels.

Thus, from the above empirical evidence, the proposed hypothesis (H1) assuming a significant influence of identified factors on smart technology adoption in room division department is therefore stand supported. Hence, the study conclude a significant influence of technology factor, organizational factor and environment factor on smart technology adoption in room division department of selected five star hotels in national capital region (NCR) of India.

## CONCLUSION AND IMPLICATIONS

The present study was conducted to discover the adoption of smart technology application in five star hotels in national capital region (NCR) in India. From the field based survey conducted on 300 respondents from selected five star hotels, the result summarized that most adopted smart technology application in room division department are business email & website, internet connectivity, social media, property management system, telephone & fax system, global distribution system, business applications (computer, printer, fax, scanner, audio-video conference) and electronic point of sale system, energy management system, voice mail box, customer relationship management, mobile phone based smart application, technology drive self-controlled room management, guest accounting management, digital stock & inventory and procurement and augmented reality based real time applications. The high mean score of these application reported their utility and importance in different operations of room division in hotel and thus hoteliers must invest to constantly such tools to raise the competitiveness of the hotel. On the other hand some

application such as artificial Intelligence based information & communication, technology based security system, room status and housekeeping management and statistics and reporting system were moderately adopted by selected five star hotels in performing different operations of room division department. This implies that these applications are rapidly getting recognition in after implementation in selected hotels and may rise in coming years. Respondents also reported some applications were remain under applied and not perceived prioritized in selected hotels. Few of such application are Virtual Reality System, cloud storage and internet of things. Thus, the selected hotelier needs to learn more about these applications.

For accomplishment of second research question, the study applied two way analyses; first identify the crucial factor influencing adoption of smart technology using principle component analysis method and secondly, predicts the influence of these factors on smart technology adoption level in room division operations of selected five star hotels. From the rotation matrix three influencing factors i.e. technology factor, organizational factor and environmental factors were identified. From the analysis of regression statistics, finding reveals that top management support, in-house awareness and expertise, and relative operational advantages under the organizational context are found to be highly influential factors for smart technology adoption whereas, technological infrastructure, technical competency and compatibility are found to be moderate influence on smart technology adoption. In addition, social influence and government support under the environmental context observed as less influence on smart technology adoption. Hence, the study discovered significant influence of all the three factors on adoption of smart technology in room division department of selected five star hotels.

## Practical Implications

From a research perspective, this paper makes a number of contributions. The current study's findings have ramifications for hospitality professionals who should continuously evaluate the smart technology applications in various hotel operations and identify follow-up smart applications to boost efficiency and improve the customer satisfaction in their establishments. To be competitive and add innovation to their service delivery system, hotel managers need more broadly allocate enough resources to boost staff members' capacity for adaptation and adoption of modern technology tools. Additionally, by enticing customers through digital communication and marketing channels for offering individualized services, the study aids employers in better understanding and serving their prospective consumers. The adoption of smart technology is affected by 12 components, which were discovered. The TOE framework and survey responses are the foundation from which the elements are

constructed. Another contribution of this study is that author used constructs i.e. Dynamic operations, staff commitment and global interface, that was not found in literature much. For one of the first research to concentrate on the hospitality industry in the Delhi NCR region of India, this research offers a theoretical framework for upcoming empirical research. As a result, hotel owners may want to contemplate emphasizing the difficulties in using high-tech devices in order to encourage the successful adoption of hotel technology. This is because there are more hotel personnel and they have different features (Chou, 2014; Jalal Sarker et al., 2003).

## Limitation and Future Research Direction

The current study came across some limitation in its investigation. First limitation noticed by researcher is that, it is focused only on perception of managers of selected hotels for understanding application of smart technology and gives no consideration to customers' reaction towards use of this technology in hotels. Hence, for more comprehensive understanding of smart technology in hotels, inclusion of customer perception is suggested to be carried out in future studies. Another limitation in the study is that it focus only room division department of hotel, thus not providing any insight to use of smart technology in other departments of hotel that are also of worth importance such as food & beverages, restaurant management, accounting and human resource. Thus, the future researchers are directed to cover this gap by assessing smart technology intervention in other departments of hotel as well. More so, further research can be carried out by focusing on providing a comparative and more comprehensive segmentation based analysis of technology application based on organization characteristics.

## REFERENCES

- Adukaite, A., Reimann, A. M., Marchiori, E., & Cantoni, L. (2013). Hotel mobile apps. The case of 4 and 5 star hotels in European German-speaking countries. In *Information and Communication Technologies in Tourism 2014*, (pp. 45-57). Cham: Springer.
- Agarwal, R., & Prasad, J. (1998). The antecedents and consequences of user perceptions in information technology adoption. *Decision Support Systems*, 22(1), 15-29.
- Akintayo D. I. (2010). Work-family role conflict and organizational commitment among industrial workers in Nigeria. *Journal of Psychology and Counselling*, 2(1), 1-8.
- Al Ghamdi, R. A., (2012). *Diffusion of the adoption of online retailing in Saudi Arabia* (Ph.D thesis, Griffith University, Australia).

- Alwan, M. (2014, June 22). Boosting the role of technology professionals in aging services. *Leading Age*, 4(4). Retrieved from <https://leadingage.org/magazine/julyaugust-2014/boosting-role-technology-professionals-aging-services-organizations>
- Buhalis, D., & Leung, R. (2018). Smart hospitality - Interconnectivity and interoperability towards an ecosystem. *International Journal of Hospitality Management*, 71(1), 41-50.
- Chahal, N., & Kumar, M. (2014). The impact of information communication technology and it's application's usage in lodging industry: An exploratory study. *IJTM*, 14(2), 1-17.
- Chou, C. J. (2014). Hotels' environmental policies and employee personal environmental beliefs: Interactions and outcomes. *Tourism Management*, 40, 436-446.
- Chauhan, V., & Manhas, D. (2013). An investigation of it adoption propensity in civil aviation sector. *International Journal of Hospitality & Tourism Systems*, 6(1).
- Cooper, M., Claster, W., Pardo, P., & Tajeddini, K. (2013). Tourism, travel and tweets: Algorithmic text analysis methodologies in tourism. *Middle East Journal of Management*, 1(1), 81-99.
- Dalgic, A., & Birdir, K. (2020). Smart hotels and technological applications. In E. Celtek (Ed.), *Handbook of Research on Smart Technologies Applications in the Tourism Industry* (pp. 323-343). IGI Global.
- Dasgupta, K., Rajesh, G., & Sethi, S. (1999). M-theory, orientifolds and G-flux. *Journal of High Energy Physics*, 8, 23.
- Dastane, O. (2020). The impact of technology adoption on organizational productivity. *Journal of Industrial Distribution & Business*, 11(4), 7-18.
- Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world: Don't start with moon shots. *Harvard Business Review*, 96, 108-116.
- Dickinson, J. E., Ghali, K., Cherrett, T., Speed, C., Davies, N., & Norgate, S. (2014). Tourism and the smartphone app: Capabilities, emerging practice and scope in the travel domain. *Current Issues in Tourism*, 17(1), 84-101.
- Foerster-Metz, U.S., Marquardt, K., Golowko, N., Kompalla, A., & Hell, C. (2018). Digital transformation and its implications on organizational behavior. *Journal of EU Research in Business*, 2018(1), 1-14.
- Garg, A. (2021). The technology acceptance and use of tablet menu among young adults: An empirical study based on UTAUT 2 Model. *International Journal of Hospitality & Tourism Systems*, 14(1).
- Grandon, E. E., & Pearson, J. M. (2004). Electronic commerce adoption: An empirical study of small and medium US businesses. *Information & Management*, 42(1), 197-216.
- Hair, J. F., Black, W. C., Barry J. B., & Anderson R. E. (2010). *Multivariate data analysis - A Global perspective*. Prentice Hall International.
- Han, D., Hou, H., Wu, H., & Lai, J. H. K. (2021). Modeling tourists' acceptance of hotel experience - Enhancement smart technologies. *Sustainability*, 13, 44-62.
- Hashim, J. (2007). Information communication technology (ICT) adoption among SME owners in Malaysia. *The International Journal of Business and Information*, 2, 221-240.
- 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.
- Jaipuria, S., & Aditya. (2021). Role of technology in accommodation operation department of hotel: An employee's perspective. In M. Singh, S. Saxena, R. Shukla, & M. Mukherjee (Eds), *Hospitality and Tourism: Emerging Practices in Human Resource Management* (pp. 70-78). Bharti Publications: New Delhi (India).
- Jalal Sarker, S., Crossman, A., & Chinmeteeputuck, P. (2003). The relationships of age and length of service with job satisfaction: An examination of hotel employees in Thailand. *J. Manage. Psychol.* 18(7), 745-758.
- Kendall, J. D., Tung, L. L., Chua, K. H., Ng, C. H. D., & Tan, S. M. (2001). Receptivity of Singapore's SMEs to electronic commerce adoption. *The Journal of Strategic Information Systems*, 10(3), 223-242.
- Khalilzadeh, J., Ozturk, A. B., & Bilgihan, A. (2017). Security-related factors in extended UTAUT model for NFC based mobile payment in the restaurant industry. *Computers in Human Behavior*, 70, 460-474.
- Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, 26(3), 310-322.
- Kim, J., & Ariza-Montes, A. (2021). The role of expected benefits towards smart hotels in shaping customer behavior: Comparison by age and gender. *Sustainability*, 13(4), 1-15.
- Kumar, P., Kumar, G. S., & Rajesh, R. (2020). Technological innovations using information and communication technology to provide better customer service in star hotels in India. *Journal of the Maharaja Sayajirao University of Baroda*, 54(2), 169-173.
- Kumar, R. (2018). *Research methodology: A step-by-step guide for beginners*. Sage.
- Lamsfus, C., Grün, C., Alzua-Sorzabal, A. & Werthner, H. (2010). Context-based matchmaking to enhance tourists' experiences. *Journal for the Informatics Professional (eingeladen)*, 203, 17-23.
- Lee, J. (2004). Discriminant analysis of technology adoption behavior: A case of Internet technologies in

- small businesses. *The Journal of Computer Information Systems*, 44(4), 57.
- Lin, H. F. (2014). Understanding the determinants of electronic supply chain management system adoption: Using the technology-organization-environment framework. *Technological Forecasting and Social Change*, 86, 80-92.
- Mahajan, K. B., Patil, A. S., Gupta, R. H., & Pawar, B. V. (2015). A new ICT based business model for tourism industry for the Maharashtra and Goa states of India. *International Journal of Hospitality and Tourism Systems*, 8(1).
- Morsan, C. (2014). An empirical examination of guests' adoption of interactive mobile technologies in hotels. Revisiting cognitive absorption, playfulness, and security. *Journal of Hotel and Tourism Technology*, 5(1), 78-94.
- Ogirima, S. A. O., Awode, T. R., & Adeosun, O. O. (2014). Online computerized hotel management system. *Journal of Computation in Biosciences and Engineering*, 1(2), 1-6.
- Oliveira, T., Thomas, M., & Espadanal, M. (2014). Assessing the determinants of cloud computing adoption: An analysis of the manufacturing and services sectors. *Information and Management*, 51, 497-510.
- Olugbemi, M. T., Ogungbayi, G. B., & Onasanya, A. S. (2020). Effect of information and communication technology usage on service delivery in hotel industries in Abeokuta Metropolis of Ogun State, Nigeria. *KIU Journal of Humanities*, 4(4), 287-297.
- Ongori H. (2007). A review of the literature on employee turnover. *African Journal of Business Management*, 49-54.
- Ongori, H., & Migiro, S. O. (2010). Information and communication technology adoption: A literature review. *Journal of Chinese Entrepreneurship*, 2, 93-104.
- Premkumar, G. (2003). A meta-analysis of research on information technology implementation in small business. *Journal of Organizational Computing and Electronic Commerce*, 13(2), 91-121.
- Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega*, 27(4), 467-484.
- Quarshie, J. M., & Amenumey, E. K. (2018). Utilization of information and communication technologies in hotel operations in the central region of Ghana. *Journal of Hospitality Management and Tourism*, 9(1), 1-13.
- Ramsey, E., & McCole, P. (2005) E-business in professional SMEs: The case of New Zealand. *Journal of Small Business and Enterprise Development*, 12(4), 528-544.
- Ransbotham, S., Kiron, D., Gerber, P., & Reeves, M. (2017). Research report: Reshaping business with artificial intelligence. *MIT Sloan Management Review* (pp. 1-17). Fall. Retrieved September 10, 2019.
- Rogers, E. M. (2003). Elements of diffusion. *Diffusion of Innovations*, 5, 1-38.
- Sekaran, U., & Bougie, R. (2013). *Research methods for business: A skill-building approach* (6<sup>th</sup> ed.). New York: Wiley.
- Sharma, V., & Bhat, D. A. R. (2022). Co-creation and technological innovation: The predictors of guest satisfaction and revisit intention in hospitality industry. *International Journal of Hospitality & Tourism Systems*, 15(1).
- Sintala, S. K. (2019). *Information and communication technology in the hotel industry* (Unpublished thesis submitted to the Kent State University College of Health and Human Services, United States).
- Soliman, K. S., & Janz, B. D. (2004). An exploratory study to identify the critical factors affecting the decision to establish Internet-based interorganizational information systems. *Information and Management*, 41(6), 697-706.
- Sun, S., Lee, P. C., Law, R., & Hyun, S. S. (2020). An investigation of the moderating effects of current job position level and hotel work experience between technology readiness and technology acceptance. *International Journal of Hospitality Management*, 90.
- Thong, J. Y. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187-214.
- Thong, J. Y., & Yap, C. S. (1995). CEO characteristics, organizational characteristics and information technology adoption in small businesses. *Omega*, 23(4), 429-442.
- Thong, J. Y., Yap, C. S., & Raman, K. S. (1996). Top management support, external expertise and information systems implementation in small businesses. *Information Systems Research*, 7(2), 248-267.
- Todd, P. R. & Javalgi, R. (2007). Internationalization of SMEs in India: Fostering entrepreneurship by leveraging information technology. *International Journal of Emerging Markets*, 2(2), 160-88.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27, 425-478.
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36, 157-178.
- Wainwright, D., Green, G., Mitchell, E., & Yarrow, D. (2005). Toward a framework for benchmarking ICT

- practice, competence and performance in small firms. *The International Journal for Library and Information Services*, 6, 39-52.
- Walker, J. (2010). *Introduction to hospitality management*. London: Pearson Education.
- Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research*, 48, 11-26.
- Wang, L., Law, R., Guillet, B. D., Hung, K., & Fong, D. K. C. (2015). Impact of hotel website quality on online booking intentions: E-Trust as a mediator. *International Journal of Hospitality Management*, 47, 108-115.
- Wang, Y., & Shi, X. (2009). E-business assimilation in SMEs of China. *International Journal of Electronic Business*, 7(5), 512-535.
- World Economic Forum. (2016). *Shaping the future of construction - A breakthrough in mindset and technology*. Industry Agenda -2016 Published by World Economic Forum (WEF), Cologny, Switzerland. Retrieved from <http://www3.weforum.org/maintenance/public.htm>
- Zhu, K., Dong, S., Xu, S. X., & Kraemer, K. L. (2006). Innovation diffusion in global contexts: Determinants of post-adoption digital transformation of European companies. *European Journal of Information Systems*, 15(6), 601-616.
- Zhu, K., Kraemer, K., & Xu, S. (2003). Electronic business adoption by European firms: A cross-country assessment of the facilitators and inhibitors. *European Journal of Information Systems*, 12(4), 251-268.