



AN INQUIRY OF THE NEW TECHNOLOGICAL INTERVENTIONS THAT AID HOSPITALITY INDUSTRY IN CRISIS MANAGEMENT: A STUDY OF 5 STAR HOTELS IN DELHI NCR

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Abstract

This study focused on five-star hotels in Delhi NCR to better understand current technological innovations that can help the hospitality industry manage crises. The lack of advanced technologies has increased the burden and stress on hotel employees. To achieve the research objective, descriptive and exploratory research was conducted.

We used knowledge management, systems and structural-functional systems theories to assess crisis communication among stakeholders. This research uses both qualitative and quantitative methods. The qualitative data was gathered by reviewing the researchers' previous work. The hypothesis is built and quantitative data is collected using a 5-point Likert Scale. This study's data is kept anonymous to avoid judging. The research results show that five-star hotels in Delhi NCR have used artificial intelligence and automation to improve the seamless customer experience and overcome organisational crises.

The research concluded that new technological interventions like Artificial Intelligence, automation, internet of things (IoT) and mobile application aided the hospitality industry in resolving its crisis on all fronts. Technological advances have improved hotel operational efficiency, allowing them to provide better service. Finally, improvements and research ideas are suggested.

Keyword: Crisis Management, Knowledge Management Theory, Systems Theory, Artificial Intelligence, Mobile Applications

PROBLEM IDENTIFICATION

Problem Statement

The hospitality industry is highly susceptible to crisis which has a potentially negative outcome. Crisis has to be managed effectively through technological interventions making end-to-end digital engagement with all stakeholders. The challenge faced by the hospitality industry is that the competence to deal with crisis situations is limited because of minimal usage of technologies leading to heavy workload and stress levels of the employees.

Aim of the study

To explore how new technological interventions will help the 5-star hotel in crisis management.

Rationale and background of the study

Crisis is an inevitable part for every hotel and poses issues related to finance, socio-economic terms, operational and managerial tasks are also affected in such emergency situation. Economic downturn and recessions, fluctuating exchange rates and withdrawal of investment by investors would trigger tourism crisis. In such a situation, there is loss of operational efficiency too, which further leads to productivity loss in the outcome from various departments of the hotel. All of this happens due to the lay-off of the skilled and trained employees of the hotel as there is not much of liquidity left at the times of crisis even to pay the salaries. At time of such crisis, technology plays a very crucial role as it smoothenes the workflow of the organisation even when there is staff shortage (**Karakas Morvay Klara, Tatar Emese, 2015**). Internal crisis are the ones which can be controlled to some extent by using the ever-evolving technologies. This research shows an increase in the usage of Machine learning like chatbox. It helps organisations to off-premise make bookings and are also utilised to count clients benefit etc. Study would show that why Artificial intelligence is important and how it makes easy for hotels to provide better service along with constant interactions with guests. Researcher also tries to show that, even at the times of crisis when there is downturn of human resource, technologies like AI, IoT and Machine learning helps to engage with guests by monitoring their data and is cost effective such as automated machines and types of robots helping to resolve the operational challenges by reducing human workload. The researcher tries to elaborate on why intervention and incorporation of Robots made tasks easier for the hotels in the times of crisis. Digitization of consumer's journey by effectual check-in and check-outs, smart mobile applications were employed for making communication smooth to achieve workflow optimization. (**Bisoi Santosh, Roy Mou, Dr. Samal Ansuman, 2020**). It is the main purpose of the research to explore why technological interventions are important in external crisis like pandemics too. The researcher would fill the gap by application of latest technological advancements in reducing stress, improve the flow of information and leveraging cognitive computing.

Statement of objectives

- 1) To annotate relationship between technological intervention and crisis management in the hotel industry.
- 2) To inquire the feasibility of Artificial intelligence and automation in improved operational efficiency.
- 3) To examine the effective flow of information with the usage of mobile applications in managing communication crisis.

Scope and Limitation

Scope

This research paper is based upon using secondary and primary methods to collect the data. The researcher aims to emphasize on the usage of new technological advancements for crisis management and how automation have improved the feasibility and work flow optimization in a hotel. The research would also focus on the intervention of the mobile applications and artificial intelligence such as chatbots, robots, etc in the improved communication networking and cognitive computing respectively. Lastly, the research paper build upon the discussion and conclude by the data applied and gathered by the middle-management and top-management of the five-star hotels in Delhi NCR along with the past work done by the authors.

Limitation

The researcher has observed certain limitation such as insufficient sample size in order to conclude a strong research result due to the time constraints and the pandemic across. Second, there is limited access to data such as the contemporary articles of the classic theories and models. Lastly, talking about crisis and crisis management the researcher lacks of the previous research studies on the topic with reference to Delhi NCR.

Literature Review

Introduction to Crisis & Crisis Management

The importance of a crisis is that a single unlucky event that interrupts normal business operations and can devastate a company's long-established good reputation. Around the world, crises are broadly classified as economic, financial, political, technological, energy, pandemic, and terrorism. These crises were either caused by natural crisis (tsunamis, tornadoes, earthquakes, hurricanes, flooding, or pandemic) or by human activity (terrorism, scandals, frauds, economic downtrend). Natural crisis is caused by natural disasters or other unpredictably occurring natural events whereas, human-caused crises are devastating incidents brought on by humans. These crises have periodically impacted the hotel industry worldwide, wreaking havoc on hotels and

jeopardizing their continued life. This research paper is more focused on crisis communication since it examined and comprehended organizational internal dynamics.

A crisis in an organization is described as an incident that is highly visible, unpredictable, and potentially disruptive in the eyes of managers and stakeholders. Crises exhibited four distinct features: (a) created confusion, instability, and change in organizations and their stakeholders, all of whom may have competing needs and demands. (b) disruptive or threatening to organizations and their stakeholders. (c) psychological phenomena, implying that they were socially created by the individuals involved rather than being a feature of objective variables in the environment; and (d) components of larger systems rather than isolated events. Researchers have stated that crisis management is a general term that referred to the behavior and communication of organizational leaders in an effort to mitigate the risk of a crisis, minimize the damage caused by a crisis, and re-establish order following a crisis (**Bundy, J., Pfarrer, M.D., Short, C.E. & Coombs, W.T., 2017**).

The researchers identified two key viewpoints in their review, each focused on a different aspect of crises and crisis management and drawn on a distinct theoretical tradition to address different research questions. The first viewpoint was internal perspective, was concerned with the complexities of risk, uncertainty, and technology management within organizations. According to the researchers, crisis management entails coordinating complex technological and relational processes and designing organizational frameworks in order to avert, mitigate, and benefit from crises. Whereas, the second viewpoint was external perspective, was concerned with the relationships between organizations and their external stakeholders, drawing heavily on theories of social perception and impression management. According to this view, crisis management entails influencing attitudes and working with stakeholders in order to avoid, resolve, and recover from a crisis (**Bundy, Jonathan & Pfarrer, Michael D., 2015**).

Necessity of technological advancements

Uncertain times have sparked a rethinking of traditional hotel operations. Rapid technological advancements have transformed the hotel industry's dynamics and business strategies (**Calvaresi, D., Ibrahim, A., Calbimonte, J., Schegg, R., Fragniere, E. & Schumacher, M., 2021**). The individual innovativeness that motivates consumers to experiment with latest technologies occurs prior to their personal exposure to any specific technology, making innovative customers an enticing market for hotels, which is why hotels that want to start new technology adoption and encourage innovation often target innovative customers. As per Rogers' diffusion of innovation theory (DOI), when a hotel introduces new innovations, individuals with a high degree of personal inventiveness behave as technology supporters (**Ciftci, O., Berezina, K. & Kang, M., 2021**).

Hotel owners have adopted new technologies to address risk and business uncertainty by relying on dynamic occupancy and average revenue levels. Significant technological advancements have assisted in mitigating

some operational challenges that arise due to various crises. The hotel industry has undergone a technological transformation, aided by artificial intelligence (AI), internet of things (IoT), and a variety of mobile applications. Responses helped fill in the gaps created by the crisis by providing accurate and trustworthy information. **(K, Crisis Communication: A Casebook Approach, 5th Edition, 2017)**. Inaction had resulted in rumours, speculation, and misinformation that had damaged the organization's image and goodwill. During a crisis, extensive research has shown that it is critical to maintain consistency across all organization's communication.

In order to be consistent in messaging all organizational spokespersons must communicate the same message to all stakeholders, regardless of their geographical location or organizational hierarchy. According to research, inconsistent messaging erodes credibility and creates unnecessary impediments to crisis management. Another area that researchers have examined is the openness of organizational communication in order to determine its effect on crisis communication **(Sasha, 2013)**.

Communicate with stakeholders in a hotel at times of crisis

According to research, open communication with stakeholders performed better than those who withheld information **(K, Crisis Communication: A Casebook Approach, 5th Edition, 2017)**. Previous study has found that firms with very effective internal communication techniques outperformed their competitors and had stronger organisational stability **(Kang, Minjeong & Sung, Minjung, 2017)**.

It was also found that a greater level of job satisfaction is attached with high communication quality, whereas a low level of job satisfaction is associated with low communication quality. Due to the labor-intensive nature of hotel work and the high turnover rate, it has become critical to study hotel employees' attitudes and motivation **(Lloyd, Robert & Mertens, Daniel, 2018)**. Improved communication can help organizations improve their quality, productivity, and competitiveness **(Wolvin, 1994)**. Employees serve as the link between a company's internal and external environments in the hospitality industry. As a result, their interactions with customers can effectively communicate the brand's promises, image, and experience.

Given the critical nature of communication, any communication problem can be resolved through proper comprehension and satisfaction with communication. According to a study done at a 5-star hotel in Malaysia, employee perceptions of internal communication are critical to the success of the company. Employees must have effective internal communication in order to communicate effectively with the public. Thus, internal communication practices are critical, as they can serve as tools for achieving the organizational objective **(Meesangkaew, 2019)**.

This research attempts to study theories like Knowledge Management System Theory, Systems Theory and Structural-Functional System Theory and the previous research work done to assess how the internal crisis communication within the organization w.r.t. hotel industry is managed to benefit the organization.

Theories to assess internal crisis communication**Knowledge Management System**

Crisis could be well managed through having proper Knowledge Management System in an organisation. Knowledge management (KM) is the process of capturing and making available the knowledge created within an organization to those who require it to make decisions. Crisis response requires decision-making under stress and time constraints. According to information processing theory, the importance of having accurate and current information is critical, even more so when organizations operate in a volatile environment integrating knowledge management processes enables managers to respond proactively to a highly turbulent environment and will benefit the organization **(Doraswamy, M., Raman, M. & Kaliannan, M., 2013)**.

The business world is transitioning from a resource-based to a knowledge-based era, based on research and development, skill development, and education. Thus, knowledge has always been the impetus for progress. Knowledge has supplanted capital, natural resources, and labor as the primary economic resource **(Khan, 2014)**. Knowledge has long been regarded as a vital and highly valued asset and commodity **(Hegazy, 2014)**. **(Cecez-Kecmanovic, D & Kennan, M.A. , 2018)** also stated that knowledge has evolved as an organization's primary source.

Knowledge Management aides in the generation and dissemination of information and knowledge. It ensures that organisations will have sustainable, strategic competitive advantages, while ensuring that knowledge is employed effectively and efficiently **(Inkinen, 2015)**. Additionally, researchers **(Wang, Mei-Hsiang & Yang, Tarng-Yao, 2016)** found that knowledge is a vital success factor for organisations seeking a sustained competitive advantage. To achieve long-term competitive advantages, organisations must develop organisational capabilities and knowledge **(Catalina, Carmona-Osorio., Santiago, Ángel-Gallego. & José, Arias-Pérez, 2017)**. Knowledge management can be a critical organizational strategy because it enables the development of new business processes that improve an organization's performance and resolve internal communication crisis **(Wu, 2014)**. One of the primary reasons for introducing knowledge management into organizations is to demonstrate the positive impact and outcomes of knowledge management on organizational performance **(Rasula, J., Vuksic, V.B. & Stemberger, M.L., 2012)**. A research is conducted and concluded that knowledge management will result in positive outcomes for organizations' innovation, product development, and employee development **(Abubakar, M.A., Hamzah, E., Maher, A. A. & Alev, E., 2019)**. Knowledge-rich organisations can improve their creativity, efficiency, and quality **(Dickel, D.G. & Moura, G.L., 2016)**.

Knowledge management enables organizations to explore individuals, groups and organizations tacit and explicit information and use this knowledge to drive decision-making. Additionally, KM contributes to the effectiveness and efficiency of human resources by minimizing communication crisis in an organization **(Byukusenge, E., Munene, J. & Orobias, L., 2016)**. According to the research, reducing lead time, product-to-market time, design cycle time and product quality are all needed to make this happen. Knowledge management helps organizations improve their customer service performance **(Rodriguez, E. & Edwards, J., 2010)**.

Organizations can effectively manage their data and information with the aid of knowledge management. At any time, employees could find customer-requested information and additionally provide better services, increasing their competitiveness **(Pension, K., Nyasha, M., Sheiller, M. & Vhuramai, C., 2013)**. In today's business environment, competitiveness refers to more than just performance, product quality, and technical efficiency; as well, it refers to the organization's ability to discover and apply new ways to overcome obstacles.

Organizations must manage innovation in order to create innovative products and services by leveraging their acquired knowledge **(Dickel, D. G. & Moura, G. L., 2016)**. An innovative approach to problem-solving relies on individual knowledge sharing.

Systems Theory

The foundation of organization is communication, and this allows members of an organisation to develop a shared reality that leads to the development of an overall system of meanings. According to open systems theory, an organisation and its members are viewed as a collective that exists in networks of relationships. The formulation and enactment of the entire organisation happens as a result of networked relationships that occur among system members **(Katz, D. & Kahn, R.L., 1978)(Flood, 2017)**.

Social systems theory, based on self-organizing systems theory, proposes that systems self-organize through communication. To be more precise, the concept presented above operates as a closed and self-referential system that engages in continuous cycles of influence and reproduction, driven by communicative processes that reinforce one another. In other words, communication is the means by which a system emerges and sustains itself, thereby distinguishing itself from its environment. A well-defined boundary between the system and the environment enables the system to respond to changes in the environment while maintaining interdependence with it **(Luhmann, 2015)(Lenartowicz, Marta, Weinbaum, David & Braathen, Petter , 2016)**.

The application of systems theory to the organizational context spawned a new wave of empirical research examining how systems theory can be used to better understand organizational behavior and communication, as well as how organizations evolve as a result of their interactions with their environments. Researchers recognized and advocated for the fact that organizations were increasingly required to operate as open systems and that their ability to grow and improve efficiency was contingent on their level of environmental knowledge. The open systems model was created to demonstrate how organizations should develop communication

processes that enable information exchange and adaptation to external environments – whether economic, political, or social **(Lai, Chih-Hui, Lin, Sapphire Huili, 2017)**.

In practice, this meant that organizational conflict and problems were analyzed using systems theory. It was used to investigate situations, diagnose problems, and recommend solutions. The critical component of applying a systems approach to organizational problems is a thorough examination of the structure, functions, processes, and environment in which the problem exists.

Researchers have also used systems theory to build effective organisational communication systems. To ensure the larger system's stability, communication was recognised as an essential component of organisational systems. It was necessary to connect an organisation both internally and externally. Organizations must communicate with multiple stakeholders.

Using the systems approach helped researchers understand organisations in new and changing environments as globalisation and the information age progressed. Organizations became more open systems, susceptible to the influence of their surroundings in the digital age, reaffirming systems theory as a viable method for studying and improving organisations. It has been proposed that complex networks and organisations can be developed through digital feedback and control mechanisms. With new technology built on systems theory, new technology resulted in practical and direct benefits to organisational smooth functioning. Organizations needed to learn how to benefit from technology integration.

Using systems theory, the company's image and public trust were restored. Thus, many organisations invest significant financial and human resources in internal communication. Internal communication practises in an organisation include formal and informal communication directed downward, horizontally, or upward to reach various audiences. In a crisis, effective communication between managers and employees is critical. It ensures the organization's cohesion and coherence.

Structural-Functional Systems Theory

It is critical to arm an organization with the information necessary for effective and efficient crisis management during times of crisis. According to the researcher, this theory explains the complexities of information networks and the various levels that contribute to the formation of an organization's command. This theory would be beneficial in determining the flow of information within an organization, where the "networks" are comprised of the employees. Thus, it is critical to study the pattern of information flow known as "networks" in order to provide a more effective response to a crisis situation, as this will increase employee readiness through the network flow system. **(Ruth, 2015), (Fedryansyah Muhammad, Beki Herijanto, Pancasilawan Ramadhan, 2020)**.

Structural-functionalism provides a logical and systematic framework for analyzing strategic planning systems that is based on systems theory and is complementary to existing theories of systems, complexity, and planning (Ruth Potts, Karen Vella, Allan Dale, Neil Sipe, 2016).

Technology transformation in managing crisis communication

Role of technology in managing crisis communication in hotel industry

The rapid expansion of the Information and Communication Technology (ICT) has revolutionized the hospitality and tourism businesses. Technology has gradually reshaped industry and society's fundamental structure. In today's competitive business environment, tourism and hospitality businesses must work hard to stay competitive. Increasing demand from sophisticated consumers, combined with the growing need to increase efficiency and customer satisfaction, has gradually increased managers' reliance on ICT to assist them in completing job tasks.

Technology has an effect on different functional areas at the administrative and organizational levels, such as cashiers, reservations staff, and housekeeping staff. Apart from the direct benefits to customers, technology increases service delivery quality by minimizing paperwork, speeding information sharing, and increasing employee productivity, all of which contribute to increased profitability.(Brochado, A., Rita, P., & Margarido, A., 2016).

Mobile networking hubs, chatbots, in-room smart technologies, and robots used during the stay create a unique customer experience by providing useful information and entertainment, saving time, and being available 24 hours a day. Additionally, the incorporation of AI into the service process eliminates the language barrier, which simplifies the process. Innovative technological solutions were not only beneficial but also fun for the hotel guests. Often, visitors have used a facility that includes a robot solely to see how it functions (Lukanova, G. & Ilieva, G., 2019).

More importantly, these developments have transformed operational and strategic management, resulting in a widespread reengineering of business processes throughout the industry. With the growing use of smartphones, tablets, and other mobile and handheld technologies in hospitality industry, some studies have examined the efficacy of integrating these technologies in enhancing the tourist experience. Knowledge-based systems have assisted managers in managing internal crisis communication effectively (Soliman, M. & Abou-Shouk, M.A., 2016). Utilizing advanced technology as a crisis communication channel aided in the prevention of disease spread and served as a vehicle for stakeholders to share information during times of crisis (Ritchie, B.W. & Jiang, Yawei, 2019). It was discovered that managers recognize that technology could improve organizational efficiency, they believed that barriers to adoption exist, including the cost of adoption, a lack of information sources, and a lack of strategy within management. Thus, technology adoption is a complicated process that is influenced by a variety of internal and external factors.

Artificial Intelligence transformed hotel industry

Technology has become the primary catalyst of human lives, infiltrating nearly every industry. Among other industries, the hospitality sector has benefited significantly from technological advances. From improved customer service to more effective energy use, hotels that exploit technology would see an increase in customer satisfaction.

In hospitality industry, technology is not intended to replace labor, but to augment it. Indeed, technology enhances a hospitality organization's competitive advantage only if it can support and enhance its employees' capacity to provide superior customer service. Numerous technological transformations like artificial intelligence, mobile applications, robotics etc. have occurred in the last few years in almost every industry to protect organizations from various crises and to streamline operations. Artificial intelligence enabled hotel industry to cut operating costs, increase productivity, and provides the best possible customer experience. Artificial intelligence is a prime example of one of these game-changing business tools **(Mosteanu, Narcisa Roxana & Galea, Kevin, 2020)**. Artificial intelligence aides in the reduction of data processing time, the assessment of customer risk, and decision-making regarding current and future client management. Artificial Intelligence can contribute to the development of a more secure business environment. Artificial Intelligence can be applied to any aspect of a business process, including front-office, middle-office, and back-office functions.

Hospitality has found a way to advance its business. For example, using artificial intelligence in search and chat platforms to improve customer service and engagement **(Kressmann, J, 2017)**. In the majority of hospitality and tourism industry, Artificial Intelligence aids the customer service department by improving the outcome of the experience and retention in a personalized manner. However, Artificial Intelligence frequently provides insightful and pertinent information that is not directly related to the guests' inquiry **(Edlich Alex, 2019)**.

Artificial intelligence, for example, has become a critical component of firms' market competitiveness. As such, the research examined the role of computer-mediated Artificial Intelligence agents in detecting business-related crises. Studies showed that knowledge extracted from routine data communications, such as an organization's email communications, enabled the detection of critical business events. In general, critical events can cause unmanageable crises if not detected early enough. An organization's history of crises can help crisis managers determine whether a recent crisis is unstable or part of a stable event **(Farrokhi, A., Shirazi, F., Hajli, N. & Tajvidj, M., 2020)**. Artificial intelligence enables the provision of tailored and personalized services to customers; the realization of scene experiences; the meeting of emotional needs; and the better meeting of basic needs. Consumer engagement and enjoyment, shopping satisfaction and loyalty, appetite and consumption can all be improved by implementing artificial intelligence technology in retail **(Tuo, Yazheng., Ning, Lanyu & Zhu, Aiyuan, 2021)**.

Role of Robots in hotels

However, robots have made significant inroads into the tourism and hospitality industry. Because of the potential impact and use of robots in the tourism sector, new opportunities to enhance and develop the travel and hospitality experience for visitors are emerging (**Logan, 2017**). There were two primary criteria that robots must meet in the hospitality market: they must provide a high-quality service at an affordable price and perform tasks reliably (**Pinillos, R., Marcos, S., Feliz, R., Zalama, E. & Gomez-Garcia-Mermejo, J., 2016**).

The concept of developing intelligent robots is derived directly from the intelligent system. The ability to sense one's environment and the ability to learn from one's actions are often used to distinguish intelligent systems from non-intelligent ones (**Gretzel, U. & Kang, M., 2011**). Machines are no longer considered tools, but rather social actors or objects. Many hotel departments have direct guest contact. A service robot could help front desk, concierge, housekeeping, meetings, and events employees by reducing workload, stress, and pressure.

The adoption of service robots benefited both hotels and consumers in a variety of ways, including enhanced and efficient service delivery, process customization, reduced labor costs, increased productivity with fewer staff, increased competitiveness, and differentiation due to technological transformation (**Seongseop, K., Jungkeun, K., FrankBadu, B., Marilyn, G. & Youngjoon, C., 2021**).

Employees benefited through technological advancement

The benefits of Chatbot Technologies are numerous, both in terms of time and quality, and quantifiable. Time perception is critical in the tourism industry, as it has a major impact on consumer satisfaction. Chatbots are seen as a 24/7 working concierge which is always willing to provide immediate assistance. Chatbots automate and simplify the human-machine interaction process; for example, 80 percent of all customer queries are handled automatically, with the remaining 20% delegated to human staff. Additionally, chatbots save workers time by automating boring and repetitive activities, thus reducing employees & staff demand and workload. (**Calvaresi, D., Ibrahim, A., Calbimonte, J., Schegg, R., Fragniere, E. & Schumacher, M., 2021**).

According to the previous researchers, technology enhances a firm's value chain, improves service quality, aids in service recovery, increases efficiency, effectiveness, productivity, and convenience, strengthens the customer-firm relationship, enhances the quality-value-loyalty chain, establishes a competitive advantage, assists customers, and enhances the skills of the service organization's employees (**Lee, Shan-Chun., Barker, Sunita., & Kandampully, Jay, 2003**)

The most effective way to prepare for future hotel-related problems is through open dialogue and debate, as well as active participation of all stakeholders. The researchers have suggested that more research be conducted on the impact of maintaining a supportive climate on the implementation of sustainable hospitality policies.

Crisis management improvement includes collaborative knowledge management processes that involve active planning through training and simulations, as well as active involvement in shared knowledge forums. The scholars were of the viewpoint that additional research should be conducted to ascertain hotels stakeholders' attitudes toward crisis and information networking, as well as to identify the primary impediments to knowledge management implementation in hotels.

Due to technological advancements in last few years, hotel employees have to perform less manual or strenuous work; routine, monotonous tasks were done by autonomous systems. Employees had more free time to engage in more important and critical tasks to smoothen the working operations of the hotel. Ultimately, these technological advancements will never be able to replace the human touch, which is critical for the hospitality sector to remain "hospitable."

Research Methodology

The purpose of this research is to provide the rationale for using **exploratory** and **descriptive** research design to accomplish the research study's objectives as well as providing a comprehensive description of the method used.

As the researcher, our own paradigm for knowledge development guides the exploratory effort and provides additional justification for strategic decisions about methodology selection, data collection, subject sampling, and data analysis.

To gain a better understanding of the current technological innovations that can aid the hospitality industry in crisis management, the researcher conducted a pilot study among five-star hotels in New Delhi and the National Capital Region. The pilot project's target audience is the hotel industry in Delhi NCR. However, a few respondents from 4-star hotels were included in the pilot study due to their participation in the survey. The purpose of choosing such a diverse background is to ascertain whether there is any variety in their feedback. The pilot project's target response rate was set at 30. A questionnaire in straightforward language was created. The survey has 21 questions divided into three sections: a) about the respondent profile; b) use of artificial intelligence and automation in the hotel sector; and c) application of the Likert Scale and hypothesis testing. The first section comprises six questions, the second section contains three questions, and the third section contains twelve questions. The respondents were instructed not to provide any form of identification in order to ensure an entirely anonymous survey. The questionnaires for the survey are included in the Appendix. A total of around 82 questionnaires were distributed via email to targeted respondents, and a total of 23 completed surveys were received. 28.05 percent of respondents responded to the survey.

Research Questions

This study sought to build a theory in answer to the following research questions:

RQ1: How do new technological interventions help the hospitality industry in crisis management?

Research Design

A qualitative and quantitative research is conducted to meet the objectives of the research and the fundamental idea of this methodology is that integration enables a more comprehensive and synergistic use of data than do separate quantitative and qualitative data collecting and analysis. A qualitative study is done where the purpose of the research is to explain a phenomenon through the perception of an individual's experience in a particular situation. As Creswell (2003) pointed out, when a researcher attempts to explore correlations between variables, a quantitative method is required. Given the study's objective of examining the experiences and perspectives of hotel employees in regard to application of advanced technology in crisis management in a hotel, both quantitative and qualitative technique were the most suited.

The research design is **deductive** in nature as it has examined the relationship between the technological interventions in managing crisis and has tested **the hypothesis by applying survey method**. The research design required the selected population from whom the information was examined and gathered. The factors of the scope of the research, and methods and processes have been used to gather information, has been often flexible and evolving; hence, mostly qualitative information wasn't as structured and sequential as quantitative.

The researcher has conducted **phenomenological approach** to describe the experiences of most of the respondents about the ease of the operations during crisis through technological advancements.

The purpose of this phenomenological study was to ascertain how hotel employees perceive and comprehend technological interventions used in crisis management in a hotel. The application of advanced technology such as artificial intelligence, the internet of things (IoT), and mobile applications by hotels in crisis management has been researched from the previous research work, and the current research attempts to establish a link between these advanced technological interventions and crisis management. Qualitative research was used to assist me in navigating my investigation alongside the quantitative research. A statement about the investigator's strategic view of knowledge motivates the research and directs every aspect of the study from question to conclusion.

According to Creswell (2003), ontology is the claim that researchers make about knowledge; epistemology is the process by which individuals arrive at that knowledge; and methodology is the process by which that knowledge is studied. To this end, our research scaffolding is constructed from an ontological perspective that assumes the phenomenon under investigation is complex and subject to inevitable contingencies.

We believe that humans' responses to their social environment are influenced by their own perceptions and have a significant impact on future actions and interactions. These ontological assumptions aided in emphasizing the hotel employee's respondents' lived experiences and worldviews and further aligned our epistemological leanings with this study.

A fundamental belief that motivates this project stems from our own constructivist disposition. Whereas an objectivist view asserts that knowledge exists independently of consciousness and experience, our constructivist epistemology maintains that knowledge is a product of the social context in which meaning emerges through interactions with others.

A constructivist study asserts that:

- the researcher-respondent relationship is subjective, interactive, and interdependent;
- reality is multiple, complex, and difficult to quantify;
- the researcher's values, those of the respondents, the research site, and the underlying theory underpin all aspects of the research; and
- the research product is context-specific.

This epistemological orientation was appropriate for my study because it structurally centered the discovery on the hotel employees' voice. The detailed description of hotel employees' participant responses aided in my data analysis. To prepare for constructivist disposition as an investigator, we considered how to make meaning personally and recognised that the respondents would almost certainly convey multiple meanings about the same issue.

The constructivist epistemology enabled us to approach our research report with an open mind. The research aimed to shed light on the phenomenon of how technological interventions helped the hotels across Delhi NCR in crisis management and how hotel employees and customers being benefitted from these technological advancements. We believe that truth is defined by what individuals recognised as their current worldview, and that new knowledge can be used to alter and expand upon what was previously recognised as reality. The objective was to elicit an understanding of how hotels perceive and experience the technological interventions in crisis management. The hotel employees' respondents' voices aided in navigating this truth.

After establishing a firm constructivist epistemology, the next step in developing my research framework was to embrace a quantitative variable through survey method. This prompted me to concentrate my research on the respondents' responses and perceptions rather than on more qualitative approach. The quantitative research evolved from earlier postpositive thinking and aims to define knowledge through cause-and-effect relationships, reduction of specific variables to specific hypotheses and questions, use of measurements and observations, and the testing of theories whereas, qualitative research is associated with a constructivist perspective. The

questionnaire is prepared and used in this research design, as a predetermined instruments for data collection that generate statistical data. Additionally, quantitative research typically places a premium on quantification during the data collection and analysis processes.

The interpretive data emerged from the survey done and was then analysed in an evolving manner and the discovery process was designed to produce a richly detailed analysis that reflected technological intervention in crisis management in the hotels. We chose phenomenology to facilitate the development of a comprehensive account of lived experiences from which "general or universal meanings are derived". After determining that a phenomenological approach was appropriate for this study, we incorporated the following recommendations from Creswell (2007) and Moustakas (1994) into the design and used them in my research project, which examined the relationship between the technological interventions like artificial intelligence, internet of things and mobile applications and crisis management in the hotels.

- the researcher identified an interesting phenomenon to study
- the researcher acknowledged and specified the broad philosophical assumptions of phenomenology
- data was gathered from respondents through filling of questionnaire
- data analysis and interpretation occurred through the application of statistical tools from which conclusion is drawn

The phenomenon is investigated by examining the respondents' feedback on the questionnaire in relation to my research questions. We purposely selected a sample size based on a specific criterion, the feasibility of the project, and to thoroughly seek saturation of developing ideas.

As researchers, we adhered to a strict code of confidentiality and kept the filled questionnaire in a protected environment. Through autonomy, beneficence, and justice, ethical principles connected aided in promoting process trustworthiness and guiding my subjective efforts throughout the study.

Data Collection Method

To begin, purposeful sampling strategy is used to identify and select hotel employees' respondents who were likely to provide information about the phenomenon being studied. The only concern was that, as a result of COVID-19, the hospitality sector was severely impacted, and due to the lockdown in almost every part of the country, it was extremely difficult to locate respondents for primary research and collect questionnaire responses from hotel employees. Next, a modified snowball sampling strategy is chosen to establish additional contact with potential respondent on various social media like LinkedIn. At each research location, each connect was asked to forward and share the questionnaire to their potential connect in their network.

The questionnaire was used to collect data. The respondents were asked to share their email as a consent to participate in the online questionnaire. Those who completed the survey via email were responded and also

thanked them for their time and informed them that the study was constrained by a narrow design and they did not fit the demographic we were seeking.

Respondents were not compensated in any way for their participation in the research. Respondents may have benefited from the knowledge that they were contributing to a body of knowledge that enriched concepts related to adoption of latest technology in managing crisis at all levels in their organization. All respondents and their responses were handled with the utmost care.

Data Analysis Process

The researchers thoroughly read and reread the questionnaire filled to establish a connection with the data and to develop an understanding of each respondent and his or her background and experiences. The researchers extracted significant information from the filled questionnaire that are directly related to the proposed phenomenon. Each of the significant statements is given an interpretive meaning by the researchers. The researchers reread the research protocols to ensure that the interpretive meanings adhere to the original description. The interpretive statements are grouped into clusters, allowing for the emergence of themes. Throughout this process, the researcher sought validation, avoids repetitive themes, and notes any discrepancies.

The data gathered through filling of questionnaire painted a vivid picture of how hotel employees view the technological interventions helping their hotels in crisis management. The data was analysed by preparing various statistical charts and also applied statistical tools like regression analysis, ANOVA to test the hypothesis. In the final stage of our research, we had to critically analysed each technological intervention which had contributed significantly to managing crisis in a hotel and how it helped in reducing the stress and workload of the hotel employees.

Credibility and Reliability

The research work conducted is genuine and original. The credibility and reliability of the research work has been trusted upon as the researcher had conducted the qualitative research by considering the previous researcher work as well the quantitative research is done through the survey method. No manipulations have been done with the data gathered and has been used as it is, to draw meaningful information from it and achieve the objective of the research work.

Data Analysis and Findings

This section presents and discusses the results of the questionnaire filled by the hotel employees. To address the research questions posed at the start of the study, responses collected were analysed, compiled, and evaluated. The findings are presented in a systematic manner in order to address the research objectives and to address the research questions.

Response Rate

The researcher mailed the URL to a total of 82 respondents who worked in a variety of hotels. 23 (28.05 percent) respondents responded and provided adequate data, while the remaining 72.96 percent indicated they would not participate for a variety of reasons.

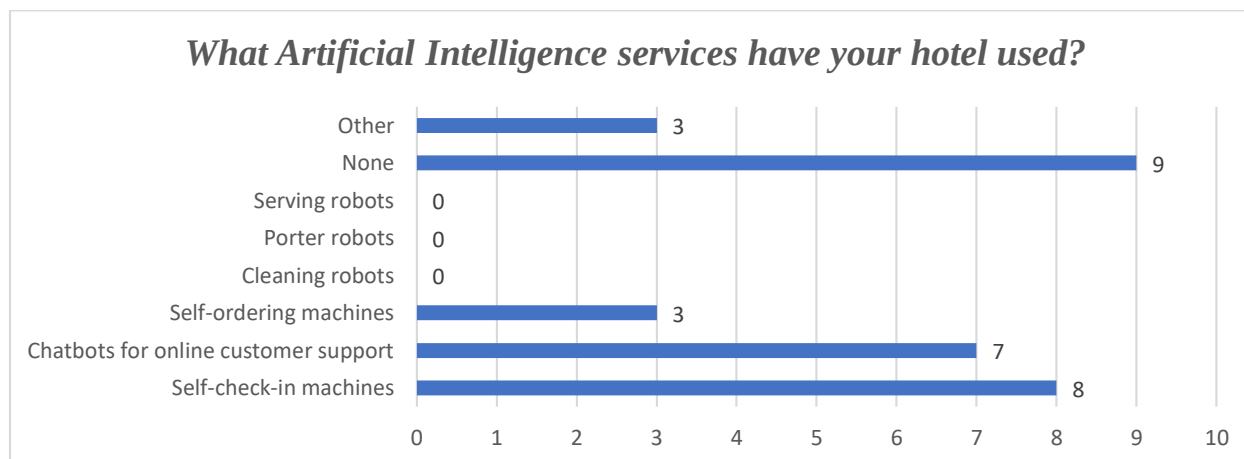
Profile of Respondents

The following indicate the respondents' profile includes their gender, age in years, level of education, and management rank.

- Male and female respondents made up 83% and 17%, respectively.
- 65 percent of respondents were between the ages of 20 and 29, followed by 22 percent between the ages of 30 and 39.
- 52 percent of respondents were postgraduates, 22% were graduates, and 22% had completed hotel-related management education.
- The respondents held various management positions, with 39% being supervisors, 35% being department managers, and 26% being department heads. The diverse range of respondents met one of the questionnaire survey's primary objectives of eliciting a diverse range of perspectives from a cross-section of hotel professionals.
- More than 50% respondents were from star hotels, while 35% of the respondents were from commercial hotels. The fact that most respondents came from the defined property aided in achieving the research objective.

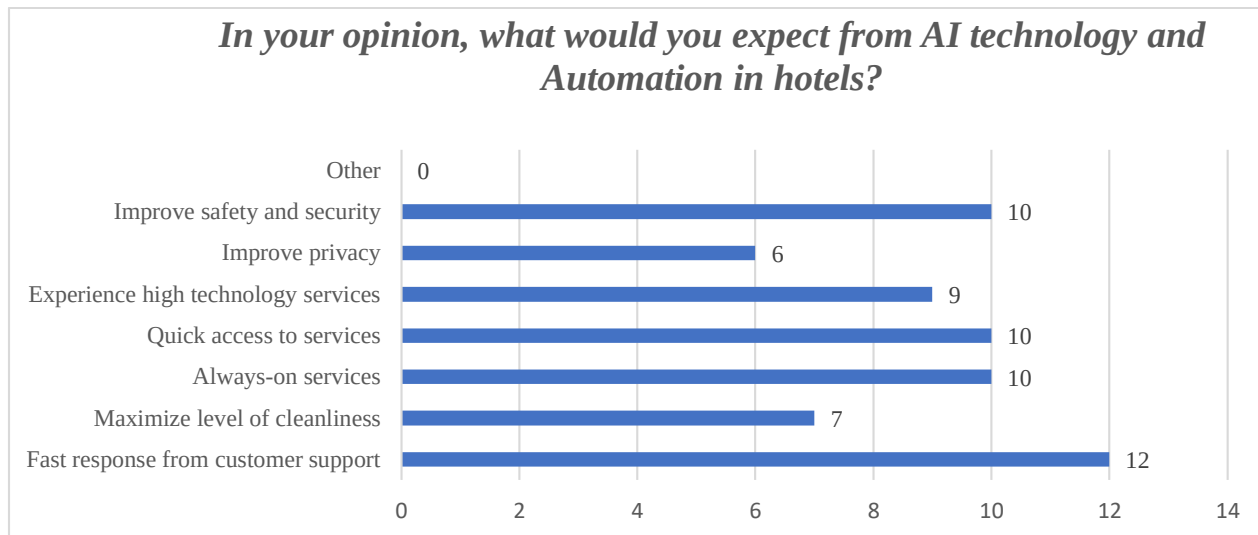
Application of AI & Automation in Hotel Industry

What Artificial Intelligence services have your hotel used?



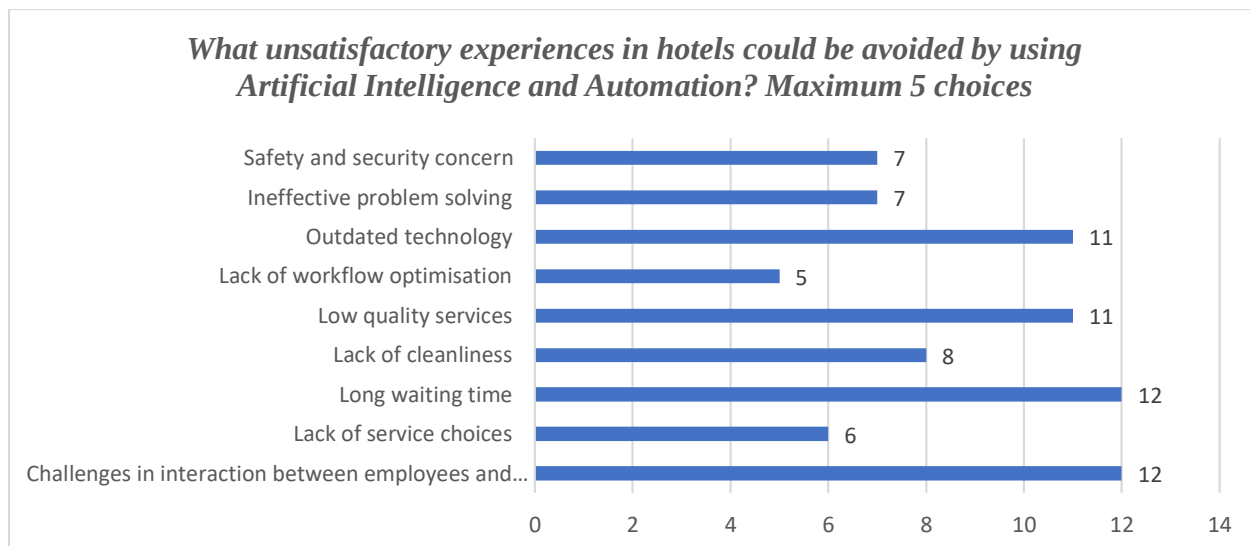
The sample utilised three major AI services: self-check-in machines, chatbots for online customer support, and self-ordering machines, whereas hotels in India have not yet begun to rely on robots to render services.

In your opinion, what would you expect from AI technology and Automation in hotels?



The sample was questioned about their expectations regarding the use of AI and automation in hotels. The majority of the sample expects rapid response from customer support, enhanced safety and security, easy access to services, and always-on services.

What unsatisfactory experiences in hotels could be avoided by using Artificial Intelligence and Automation? Maximum 5 choices



There were numerous unpleasant experiences that could be avoided in the hotel industry through the use of AI and automation, but the most significant ones were the reduction of long wait times, difficulties in interacting with customers, low-quality services, and outdated technology.

Hypothesis Testing

The researcher has applied Likert Scale to collect and analyse information based on technology intervention helped the hotels in managing crisis. The Likert Scale is a 5-point scale (1=Strongly Disagree, 2=Disagree, 3=Not sure, 4=Agree, 5=Strongly agree). The researcher used the ANOVA test to determine whether the means

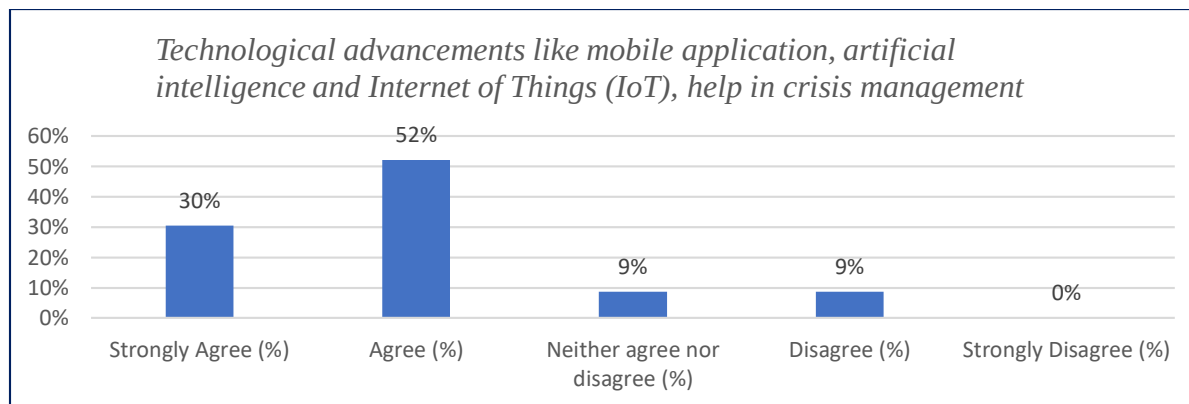
of two or more groups are significantly different. By comparing the means of different samples, ANOVA determines the effect of one or more factors.

Hypothesis 1:

H₀: There is no significant relationship between the technological interventions and crisis management in 5-star hotel.

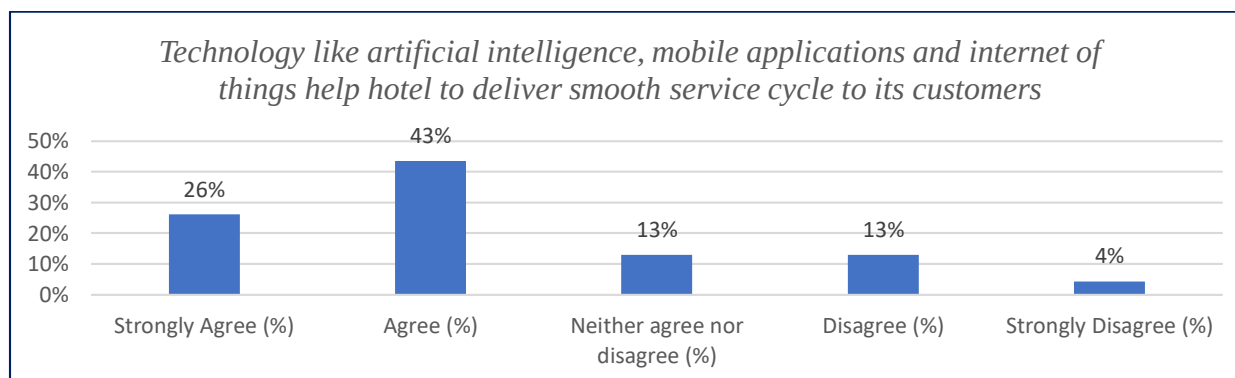
H₁: There is a significant relationship between the technological interventions and crisis management in 5-star hotel.

Statement 1: Technological advancements like mobile application, artificial intelligence and Internet of Things (IoT), help in crisis management



82% of respondents agreed that technological advancements such as artificial intelligence, the Internet of Things, and mobile applications will aid hotels in crisis management.

Statement 2: Technology like artificial intelligence, mobile applications and internet of things help hotel to deliver smooth service cycle to its customers



69 percent of the hotel's latest technology interventions, such as AI, IoT, and mobile applications, aid in the hotel's smooth service cycle and have changed the technology landscape in recent years. The advancement of technology opens up incredible opportunities for improving the customer experience. The hotels benefit by significantly reducing agent time, effectively managing high-volume tasks, and providing always-on customer

care. The opportunities for applying AI to the hospitality industries are vast; however, it is up to the hotels to assess the potential benefits and demand for AI in order to determine whether AI is worth considering.

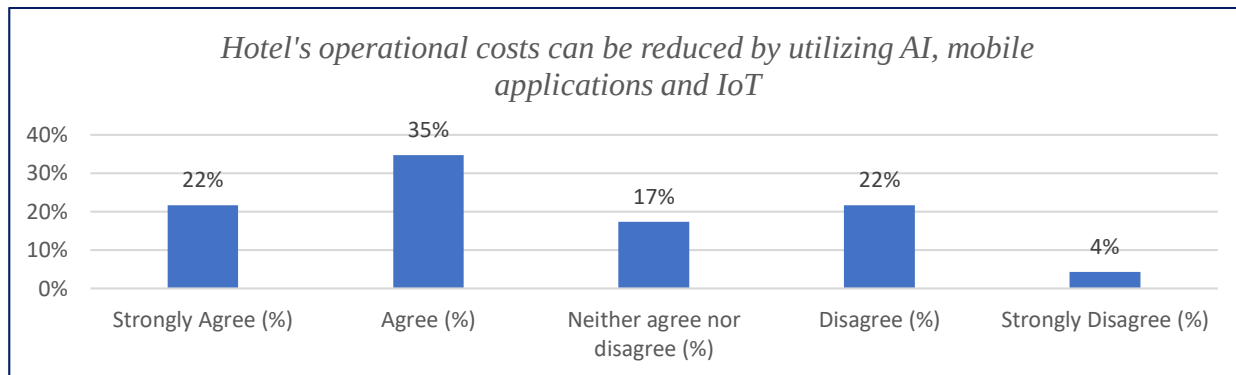
After applying ANOVA, the P-value computed is 0.0005 which is less than .05. It indicated that the null hypothesis is rejected statistically and the alternative hypothesis is accepted. As a result, it is possible to conclude that there is a correlation between technological interventions and crisis management that results in a smooth service cycle to its customers. Crisis management entails risk management as well, as crises occur when risk is not appropriately and effectively managed. For example, if hotel industry does not prioritise risk management, they risk endangering the lives of their guests and thus latest technological developments play a pivot role in mitigating the risk at all levels in the hotel.

Hypothesis 2:

H₀: AI has not improved the operational efficiency of the 5-star hotels.

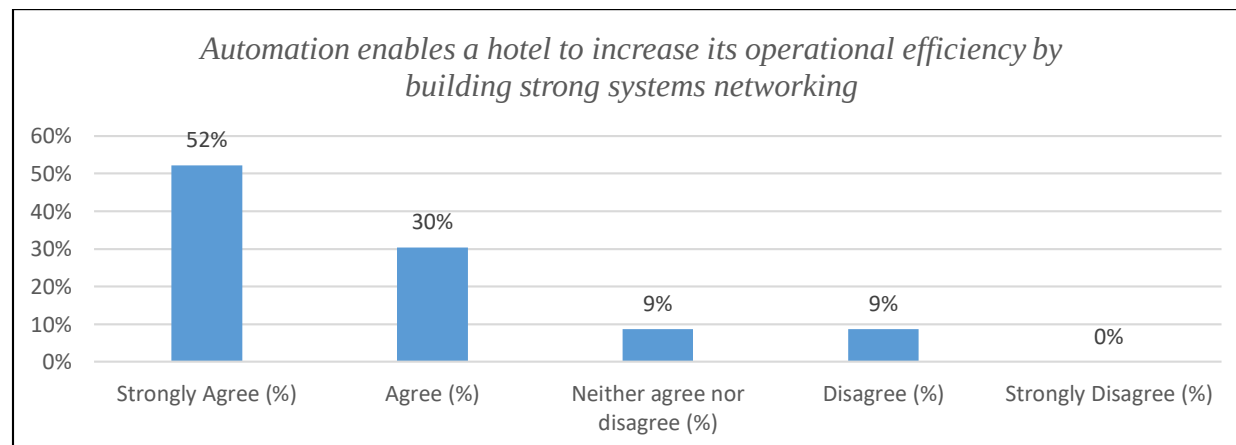
H₂: AI improves the operational efficiency of the 5-star hotels.

Statement 3: Hotel's operational costs can be reduced by utilizing AI, mobile applications and IoT



57% of the hotel employees agree that artificial intelligence and automation helps in improving the operational efficiency and also reduces their workload

Statement 4: AI and Automation enables a hotel to increase its operational efficiency by building strong systems networking



82 percent of respondents agreed that implementing AI and automation in a hotel improves operational efficiency by establishing robust system networking.

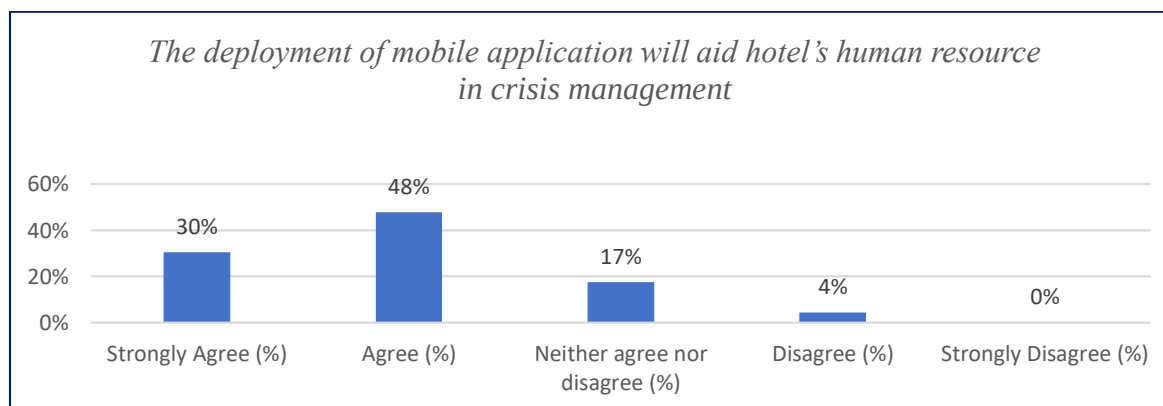
The P-value of 0.0006 which is below than 0.05 indicated that the null hypothesis is statistically rejected and the alternative hypothesis is accepted. As a result, it is possible to conclude that Artificial Intelligence and operational efficiency are related, as AI increases the operational efficiency of hotel employees while decreasing their workload. As AI gets more sophisticated, it is envisaged that smart systems will discover new methods to optimise hotel's processes, systems and procedures, thereby increasing operational efficiency. The relationship between businesses and suppliers will also need to handle the growing requirement to integrate Big Data information in order to provide better service to customers and upsurge operational efficiency. Modern hotels are now employing AI and automation to deliver a more personalised and memorable experience for their guests while also cutting labour costs.

Hypothesis 3:

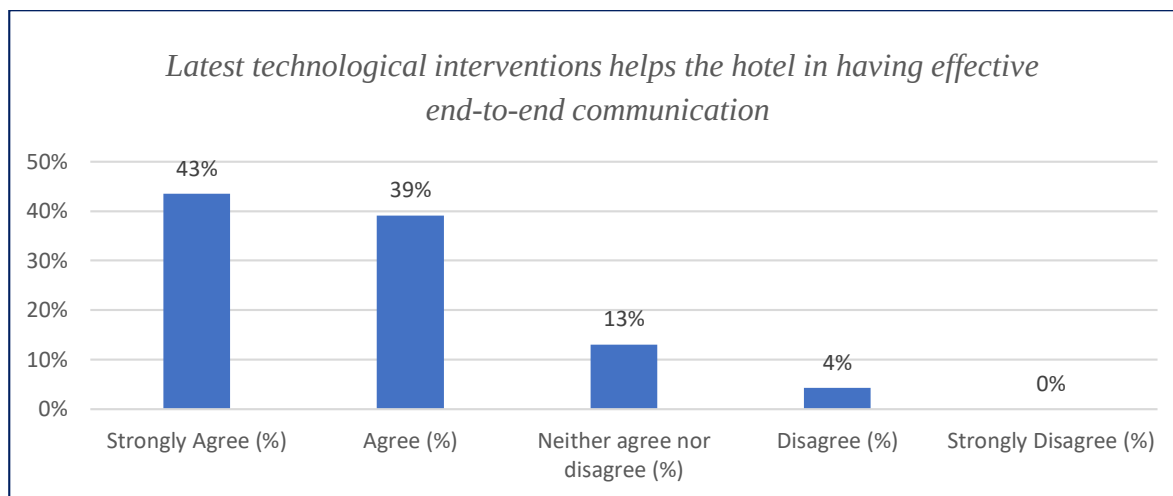
H₀: Usage of mobile applications do not manage the communication crisis in 5-star hotels

H₃: Usage of mobile applications manage the communication crisis in 5-star hotels

Statement 5: The deployment of mobile applications will aid hotel's human resource in crisis management



78% of the respondents were of the view that mobile applications help the hotels' manpower to manage crisis effectively.

Statement 6: Latest technological interventions help the hotel in having effective end-to-end communication

81% of the respondents have agreed that the latest technological interventions like mobile applications and AI helps the hotel in having effective end-to-end communication with the existing and potential customers, suppliers and other stakeholders. The mobile applications also contribute significantly in speeding up the quality delivery service to its customers.

The P-value of 0.0002 indicates that the null hypothesis is statistically rejected and the alternative hypothesis is accepted. As a result, it is possible to conclude that the application of mobile applications manages the communication crisis in hotels by having effective end-to-end communication with all the stakeholders, thus expediting the entire delivery-service process. Even if not all customers want to use the latest technology, the hotels want to introduce and use it to compete. Customer experience improvement was the main strategic priority, along with supporting managerial difficulties.

Other key findings:

- 69 percent of respondents believed that AI presents more opportunities than threats in the workplace.
- 61 percent of respondents felt that AI / robots are capable of doing simple and repetitive tasks in conjunction with a hotel's structural functional model.
- 79 percent of respondents agreed that hotels should provide formal training to their personnel on how to use artificial intelligence and mobile applications prior to using these technologies.
- 78 percent of respondents agreed that the implementation of AI, mobile applications, and IoT reduces the workload of hotel human resources.
- 78 percent of respondents believed that hotels that employ these technologies get a competitive edge in terms of service quality.
- 70% of respondents felt that technological interventions such as artificial intelligence, the Internet of Things, and mobile applications are now considered as vital and unquestionably accelerated for consideration by hotel industry executives.

The researchers summarized the findings of the questionnaire and to see the differences in the application of technology in crisis management in the hotel, it can be said that the hotels are well-equipped with the latest technologies such as AI, IoT and Mobile applications. It has been analysed in the above section from the pragmatic data analysis that the five-star hotels in Delhi NCR have utilised the artificial intelligence and automation to get increased feasibility in the seamless customer experience, by overcoming the crisis in an organisation. It has been observed from the literature reviewed in the previous chapter and the data collected and analysed is that, there is a research gap and lack of robot application in five-star hotels in Delhi NCR. This research is geographically restricted to Delhi NCR and henceforth the sample size is small.

Conclusion

The hotel management process is very complex, owing to the services provided, which may include a variety of different operations conducted in-house or through outsourcing. On the other hand, the hotel industry, like any other, is susceptible to both internal and external influences. These must be anticipated, and a plan for crisis management must be in place. To meet the needs of global tourists of all generations in such intricate conditions, hoteliers must be more entrepreneurial, imaginative, penetrative, persistent, and patient. The characteristics of hotel services, the hotel's organisational structure, the application of technology, the role of human resources, the importance of standards, and the specifics of operating a hotel company are the most critical factors that every manager must consider.

Hotel managers must devote significant time in researching potential crisis situations in hotels, as well as developing contingency plans in case they occur. Additionally, it is recommended to plan ahead and prepare all preventive activities related to hotel security, emergency response procedures, hotel staff safety training, and crisis management team formation. By minimising communication crises in an organisation, theories such as knowledge management and systems theory contribute to the effectiveness and efficiency of hotel staff and employees by building strong systems model.

We conclude by answering our Research Question followed by the analysis drawn from the primary research piloted and then further future research advice.

The researchers concluded that new technological interventions aided the hospitality industry in resolving its crisis on all fronts. Technological advancements have facilitated hotels' ability to provide superior service by increasing operational efficiency. Additionally, the research revealed that the introduction of new technologies has reduced the workload of employees, allowing them to focus on the hotel's critical areas. Digitization of the consumer journey through effective check-ins and check-outs, as well as smart mobile applications that facilitate communication, were used to optimize workflow. The researcher attempted to identify gaps and the gaps filled through the use of cutting-edge technological advancements in hotels.

This research finding reveals that AI has provided significant opportunity to hotels to alleviate the human resource performance and has given hotels a competitive advantage over other players in the industry. AI has penetrated the traditional hospitality industry with the prominence to help hotels achieve improved customer experience, increase revenue, and enhance their reputation. Another outcome derived from the research was the benefit of implementing AI was that it not only improved customer service, but also resulted in faultless decisions based on massive amounts of data.

The research also concludes that the hotel industry's purpose in adopting mobile technologies is to give the greatest client experience possible. To manage productivity and efficiency effectively, hotels require precise standards for comprehending and projecting the implications of their input and output prioritization and arrangement. Effective strategic and operational decisions are founded on the assessment and organization of inputs, and correct organization of outcomes results in increased efficiency. As a result, this research stresses mobile technology as a critical resource for balancing service efficiency and effectiveness. Despite the managerial problems highlighted in this report, the luxury hotel sector views mobile technology adoption as an opportunity rather than a danger. Mobile technologies facilitate resource access and collaboration with other players in the process of co-creating value in a very effective manner, hence improving guests experience and hotel performance.

Hotel guests' and employees both contribute significantly to value co-creation via mobile technology applications, which are well within the scope of management control and support indicated in this study. The primary problem here is reserving more time for personalized service and face-to-face encounters, which can provide guests with a personal touch and communication to maximize positive guests' experiences.

This survey focuses on managers' perspectives on using mobile technology to benefit both hotel guests' and employees. Our findings contribute to a scientific understanding of practice-based issue identification that informs the development of technology solutions for hotels. This study paves the way for future research. There is a need for greater empirical research investigations studying the hotel guests' point of view in mobile technology practices and comparing perceptions of hotel guests and staff. The researcher also encourages more research into the three factors that influence mobile technology adoption: service efficiency, effectiveness, and productivity.

This study makes several practical recommendations to hoteliers. They may be able to close the gap between their expectations and their hotel guests' perceptions in order to leverage the potential of hotel mobile app services. To begin, because customers may not perceive the value of hotel mobile apps even if they adopt the technology, it is critical to understand the context of app usage and to incorporate contextual variables into app design to maximize value-in-use.

It is deduced from the existing literature, quantitative research and hypothesis 3 that implementing mobile applications reduces the communication crisis in hotels by improving end-to-end communication throughout the entire delivery process, thereby accelerating the entire service delivery process.

It could also be concluded that due to technological advancements over the last few years, hotel employees are required to perform less manual or strenuous work; routine, monotonous tasks are now performed by automated systems. Employees gained more time to focus on more critical and time-sensitive tasks that aided in the hotel's smooth operation.

It was obvious that the nature of the crisis is critical because it provides an estimate of the resources and time required for decision-making. Additionally, it is possible that decision stages and quality improve in lockstep. However, empirical evidence suggests that even with a transparent and clear image of a company's crisis, faults and errors may occur. As a result, recognizing erroneous decisions necessitates a re-evaluation of the situation and the formulation of new recommendations.

Future Suggestions

This research work provides an opportunity for further research based on its limitations and empirical findings. To begin, given the small sample size and the fact that this research was confined to Delhi-NCR, one might consider repeating this study with a larger sample size. This will increase the study's credibility and provide more detailed information about decision-making in several hotels. Second, by utilizing a variety of methods, such as quantitative research, the future research could examine the relationship between decision-making and how crisis management team responds to crises. We hope that this study provides useful information and serves as a foundation for future research on the subject.

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