



Developing an Innovative Technology Model for Hotel Reception Desks in Iran

Saeid Nourian

Ph.D. candidate in Business Administration, Business Policy, Kish International Campus, University of Tehran, Kish Island, Iran. E-mail: saeid.nourian@ut.ac.ir

Amir Manian

Prof., Department of IT management, Faculty of Industrial Management and Technology, College of Management, University of Tehran, Tehran, Iran. E-mail: amanian@ut.ac.ir

Abbas Nargesian *

*Corresponding author, Associate Prof., Department of Leadership and human capital, Faculty of governmental management and Organizational science, University of Tehran, Tehran, Iran. E-mail: anargesian@ut.ac.ir

Abstract

In an era where customer expectations are rapidly evolving, enhancing the efficiency of hotel reception services in Iran is crucial for the growth of the hospitality sector. Recent research highlights the importance of digital transformation in improving service delivery and operational efficiency in the hospitality industry. These studies indicate that technological advancements can significantly streamline operational processes, improve customer satisfaction, and foster a competitive advantage in the hospitality industry. This research presents a technological innovation model aimed at modernizing reception desk services, addressing the pressing need for improvement in this area. Using an interpretive paradigm and an inductive approach, we conducted a qualitative study that incorporated a systematic review. Subsequently, the structures and components were extracted from the studies through qualitative coding. Our findings, derived from a review of 54 studies, revealed 295 open codes distilled into 15 constructs and four main components. This study highlights the significant impact of technological innovation on reception services, emphasizing the roles of ease of use and perceived usefulness in the technology adoption process. These insights provide essential guidelines for advancing reception desk technologies within the Iranian hotel industry, ultimately contributing to enhanced service quality.

Keywords: Innovation, Technological Innovation, Hotel Service Reception Desk, Hotel.

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Introduction

Innovation in front desk technologies strongly affects how organizations and companies create value (Singh et al., 2017). To understand the overall value and impact of technologies, it is important to consider the impact of technology from a company's perspective. In the context of the pyramid model for technology-company integration, the technology implemented in the work environment can offer significant benefits across several hotel operational processes, including asset management, information management, and performance management (Buhalis, 1998). Importantly, technological innovation often affects human resource management practices (De Leede & Looise, 2005; Jiménez-Jiménez & Sanz-Valle, 2005). While some previous research has focused on the effects of information technologies on traditional HR practices (e.g., Hendrickson, 2003; Parry, 2011), the effects can extend to broader HR practices such as employee recruitment, training, and retention. For example, many hotels emphasize technical skills when hiring employees (Chan & Coleman, 2004); if new technology is easy to learn, this requirement can be reduced, resulting in less focus on technical competence and more on service competencies.

Considering the necessity and importance of this research, the extracted pattern from this study can ultimately lead to increased effectiveness and efficiency, and ultimately to guest satisfaction. It can be argued that guests often write reviews on e-commerce and booking websites to express their opinions about products and services. These reviews are usually unstructured data. Typically, researchers analyze them to understand customer sentiments. Hotel managers can also use these reviews to gain insight into customer psychology through positive and negative feedback. This approach converts qualitative data into quantitative measures, evaluating customer satisfaction with service quality. As a result, specific aspects of hotel services that contribute to customer satisfaction can be identified, with the reception desk often being a central focus of these services (Nguyen & Nguyen, 2023).

In addition, hotel front desk technology is a key factor in the guest and staff service delivery experience. The adoption of technology has transformed the experiences of providing and receiving services from "stuffy and old" to "low-impact and modern" (Bitner et al., 2000). However, innovative technologies can make the experience more enjoyable and customized, creating more value for both guests and key employees (Marinova et al., 2017). Therefore, more research needs to focus on front-desk technology responses and experiences to

understand their effects on productivity and guest service experiences (Parasuraman & Colby, 2015). However, there is only limited research on the effects of front desk technology on these experiences (e.g., Bilgihan et al., 2011; Kokkinou & Cranage, 2013).

Guest-centric hotels strive to provide unforgettable experiences to guests and go above and beyond the norm. For example, providing modern services, simplicity at the peak of technology, the possibility of using smartphones as room keys, installing a device in each room to control multiple functions, etc., are services that hotels can provide to meet the wishes and expectations of guests. Hotels can build long-term relationships with guests by understanding their needs and putting them at the center of the business. Establishing guest-centered models in the hotel and constantly asking whether a service can give a unique experience to the guest and create long-term relationships will help to better understand and know the guest.

Continuous training of employees is essential; some hotels often ignore the role of human resources training in achieving their ambitious goals. However, some managers do not view technology as a disruptive factor but consider it effective in transforming people, processes, and hotels into factors that are fully ready for change and adaptability. Forward-looking hotels are revising the characteristics of their workforce in response to rapid changes in business goals. The training of hotel staff regarding the use of new technologies to provide better services is a requirement that should be taken seriously. Although technology can be a substitute for guest interaction, it cannot replace friendly service. Hotel guests need to receive information such as recommendations for restaurants and tourist attractions, directions, instant internet connection, etc. But how can you expect a hotel employee to be an expert in all these things? By training employees to use technology to enhance hotel service delivery, they can be encouraged to provide better service. When a new technology is implemented, training should accompany it. Regular training courses for employees to ensure that they are equipped to use the latest technologies can help provide the best possible service (Eslami Mehdiabadi et al., 2019).

Further research adopting a more comprehensive framework for understanding the impact of technological innovation on both service and employee experiences is needed. Compared to the reception desk of domestic hotel services in our country, no academic research has been conducted on this topic yet. Taking into account modern international models will strengthen research and solve the problems of hotel reception desks, significantly creating more opportunities for innovation and entrepreneurship and improving performance. The core and main benefit of the current research can eliminate the shortcomings of the lack of up-to-date acceptance of hotel services in Iran and play a significant role in the development of hotel services.

The hospitality industry in Iran, a country rich in cultural heritage and tourism potential, faces significant challenges in adapting to modern technological advancements. Despite the increasing global reliance on technology to enhance guest experiences and streamline operations, Iranian hotels often lag in implementing innovative front desk solutions. This gap not only affects operational efficiency but also diminishes the overall guest experience, which is critical in a competitive tourism market (Khan & Rahman, 2020). Research indicates that the integration of advanced front desk technologies—such as automated check-in systems, mobile applications, and customer relationship management (CRM) tools—can substantially improve both service delivery and customer satisfaction (Baker & McCulloch, 2018). However, the unique socio-economic and regulatory landscape in Iran presents distinct barriers to such technological adoption (Zarei et al., 2019). These barriers include limited access to cutting-edge technology, lack of skilled personnel, and resistance to change within traditional hotel management practices. This article presents a comprehensive model for front desk technology innovation tailored specifically for the Iranian hotel industry.

Therefore, the purpose of this research is to present a technology innovation model for the reception desk in hotel services in Iran. The initial step involves gathering accurate information in this area. The current research has made progress toward this goal. Consequently, the research question addressed is: What is the technology innovation model for the reception desk in hotel services in Iran?

Literature Review

Most researchers in the field of technology in society assume that the emergence of modern information technology and its expansion into various aspects of life have caused a tremendous change in the relationships governing human society. The increasing development and use of information technology require training and preparation in information networks (Szymkowiak et al., 2021). Therefore, addressing the major challenges of the information age requires preparation in the information field, and organizations must have a framework to assess their readiness in information technology and tackle these challenges effectively (Hosseini et al., 2013). Fathian (2004) suggests that all electronic readiness assessment models measure five general categories: society, people, economy, technology, and education. The dimensions of electronic readiness include the dimension of products and services, as well as managerial dimensions such as organizational, national, industry, value, regional, international, individual, and acceptance (Hosseini et al., 2014).

Technology readiness reflects personal views and willingness to use information technology products and services in daily life, and technological readiness can help people achieve their professional goals (Kuo, 2013). Previous studies indicate that people have different personalities and attitudes toward using technology (Rogers, 2003). One of the most renowned technology readiness models is Parasuraman's Technology Readiness Index model.

Developed in 2000, this model provides technology readiness indicators to measure the level of readiness to use technology. The Technology Readiness Index model is more inclined toward the use of technology rather than the competence to use it (Parasuraman & Colby, 2001).

The technology readiness index model defines users based on personality characteristics in four groups: optimism, innovation, discomfort, and lack of security. Each of these dimensions is defined as follows:

- 1- Optimism: positive belief about technology in increasing control, flexibility, and productivity;
- 2- Being innovative: willingness to use new technology for the first time;
- 3- Uncomfortable feeling: understanding the lack of control over technology and feeling overwhelmed by it;
- 4- Lack of security: lack of trust in technology regarding security and privacy and doubt about its ability to work properly (Walczuch et al., 2007).

The first two dimensions express the positive induction towards the use of technology and in a way promote it, and the last two dimensions show the dimensions that somehow hinder the adoption of new technology. To measure the technology readiness variable, the technology readiness index questionnaire designed by Parasuraman and Colby (2015) was used.

Although the use of computers has been prevalent in large organizations in industrialized and developed countries since the 1950s, the subject of information technology has only been incorporated into management culture and educational resources since the 1980s. Information technology is a concept that has yet to receive a comprehensive and precise definition. Some definitions emphasize the technological aspects, describing it as a collection of hardware, software, databases, and other communication equipment. Others refer to it as a system of devices, users, and information management that can transform business operations and provide a competitive advantage in today's business environments. In our country, although efforts have been made to apply information technology in various fields, its full potential remains underexplored (Hakimi, 2015).

Reception desk service at a hotel

The service desk is defined as the only point of contact between the service provider and the users. A typical service desk manages events and orders and enables communication with users. Simply put, a service desk is a communication center where guests (who can be employees or other stakeholders) receive assistance from IT service providers. This assistance

may involve solving a problem or responding to a service request. Regardless of the nature of the assistance, the goal of the service desk is to provide quality services to guests promptly. The service desk includes various activities, such as service request management, incident management, knowledge management, self-service, and reporting. Communication with the problem and even changes to the management process at the service desk occur (Tello et al., 2018). The service desk creates and manages departmental knowledge by providing problem-solving to guests or managing service requests. It offers self-service options to guests who want their problems resolved quickly and independently. While the service desk can vary in its scope, it is fundamentally a guest-oriented, service-focused, and robust method of providing information technology assistance to guests (Nikkho, 2019).

The service desk is a communication center within an organization and serves as the only point of contact between the organization and its internal and external clients. This center aims to provide timely and efficient services to clients at any time, in accordance with the agreements between them and the organization. To deliver better help desk services, this center should align with relevant methods and frameworks. One of the most important and effective frameworks in this field is the "assets and equipment management under information technology control" framework, which identifies this center as a crucial function of information technology units for the efficient and effective management of services to clients. It also provides detailed standards for the establishment and management of this center (Nordhorn et al., 2018).

The service desk is an organizational unit with dedicated personnel; formed to implement a diverse set of activities related to information and communication technology services to respond to signals that are usually sent through phone calls, web requests, or automatic messages generated by the event management system (Kuzmin et al., 2018). The service desk is considered one of the vital parts of organizations and businesses. It seeks to create a single point of contact to solve the daily communication needs between the users of the organization's services and the forces deployed on the service provider side (Yamaoka et al., 2019).

The main duties of this unit include handling incidents, referring some incidents to the problem management team, managing requests, and answering questions related to services. Additionally, this unit interfaces with other processes and activities, such as handling user change requests, managing contracts, overseeing software licenses, managing service levels, handling asset management and service configuration, managing accessibility, overseeing service financial management, and ensuring service continuity. The value of an effective service desk should not be underestimated. A good service desk can compensate for many of an organization's deficiencies, while a weak service desk (or the complete absence of one) can create a negative perception of the organization's effectiveness and activity. Therefore, it

is crucial to recruit the right individuals for this unit and to make it an attractive work environment to retain human resources (Astuti et al., 2018).

The nature, type, size, and location of a service desk depends on the type of organizations, businesses, number of users, complexity of calls, range of services, and many other factors (Holt et al., 2017). The extended service desk includes both a help desk and a call center, and it is not limited to functioning solely as a call center. It encompasses several important processes, including managing the entire lifecycle of incoming calls to the organization. This includes handling various types of requests, events, and issues from the time of registration in the database through to resolution and, if necessary, escalation to higher levels, termination, and ongoing notification of their status to the client (Commenoz et al., 2020).

A help desk is a group of people who often provide help and information for computer or electronic problems. With this definition, it may seem at first glance that the service desk and help desk are slightly different, but the keyword that is not seen in this definition is "guest". Although the main focus of the help desk is to solve the problem, the focus of the service desk is to provide services to its guests or users. The emphasis on service and guest-centricity at the service desk is not there at the help desk. Unlike the help desk, which includes only one activity (especially incident management or problem-solving process), the service desk includes a wider range of activities than we mentioned above. Therefore, the help desk is a subset of the service desk (Amiri, 2017).

Therefore, the help desk is typically a unit within the organization that addresses problems and incidents encountered by personnel using information technology services. Issues related to computers, software, and hardware make up the majority of the problems reported by employees. One key difference between a help desk and a call center is that call centers focus on diagnostics to gather information and resolve issues, while help desks generally provide problem-solving support based on predefined solutions tailored to the caller's conditions. Understanding these distinctions allows an organization to use these services as complementary tools to the service desk. It is important to note that call centers, communication centers, and help desks each cover only a portion of the tasks included in the definition of "service desks," as outlined in the framework for "management of assets and equipment under information technology control" (Commenoz et al., 2020).

The Origin and Evolution of the Service Desk in Management and Its Entry into the Hotel Industry

In the past, public administration focused on the events inside the bureaucracy and mainly considered the internal problems of the bureaucracy as the main issue. Today, public administration must know the social and general dimensions of its profession, be aware of the effects of its organization on its social environment, and make the issues of citizens and citizenship its mental concern. New approaches, unlike traditional approaches, have focused

on various indicators that are mainly non-financial. In the administrative and executive systems of countries, administrative efficiency and client satisfaction with government institutions are key criteria and indicators of the evolution of the administrative system. These factors are essential for evaluating and improving the performance of government organizations. According to scholars of coercive political science, if governments fail to meet the material and spiritual needs of their citizens and ensure their satisfaction, various crises may arise, such as a crisis of public trust, a legitimacy crisis, a crisis of public participation, and an integration crisis. These crises not only reduce the efficiency and effectiveness of the political and administrative system but also disrupt the development process. Therefore, managing the performance of government organizations to improve the quality of services provided and create satisfaction among citizens and clients can be very important. This management plays a strategic role in the transformation and development of societies because enhancing the performance of government organizations and their competitive ability increases their productivity and responsiveness. Although these two groups have major differences in their needs from the organization, they share common expectations and needs. If your team wants to provide a service desk, you need to choose the right service desk software, because it is the basis of IT service management. The service desk serves as an interface between the guest and the team. While features such as reporting and knowledge management are important in a service desk, it is also crucial that the service desk is user-friendly, easy to set up, facilitates collaboration, and aligns with your needs. In this way, the IT team can provide excellent support and increase business productivity. Even if a team decides to use a help desk, it's important to have a tool to help track issues and someone to resolve them. With a dedicated help desk tool, IT teams can be more transparent, collaborative, and efficient.

Therefore, the wide range of services offered by the service desk has made it an essential element in any organization. Contact and communication with technology in any business require a service desk, and every organization interacts with technology as part of its functional process. Therefore, it is very important to choose the right service desk software that has speed, ease, and efficiency (Nikkho, 2019).

Empirical literature review

In this section, the research results related to the reception desk technology innovation model are presented in the table below.

Table 1. Experimental background of the research

Researcher And Year	Research Title	Research Methodology	Data Collection Tool	Society And Example	Research Results
Justita et al. (2021)	Assessment Quality Services Management Complaints Table service	Quantitative-descriptive-Practical	questionnaire	Clients and university students-384 people	In this study, service desk quality was evaluated by determining the sigma level to identify the root of the problems. Complaint data from the help desk of an IS/IT department at a public university, collected between 2016 and 2017, were used for this evaluation.
Menon and et al. (2020)	The effect of electronic service desk on guest satisfaction	Quantitative-descriptive-Practical	questionnaire	384 guests	Based on the obtained results, all the hypotheses have been confirmed and the electronic service desk has increased the satisfaction of the guests.
Nordhorn and et al. (2018)	Size get Response Hi Emotional To reception desk Services And Quality Relationships	Quantitative-descriptive-Practical	questionnaire	225 guests randomly in 6 groups	The results of this study suggest that improvements in marketing services and the adherence to high-quality standards can lead to increased guest satisfaction. However, the process of achieving this may be gradual.
Kuzmin and et al. (2018)	Development Elements System Management Quality Services the reception service desk And stay At Hotel	Quantitative-descriptive-Practical	questionnaire	384 hotel guests	This article describes front desk and accommodation services as integral components of the hotel industry, aimed at meeting the needs of hotel guests. The fundamental level of quality control for front desk reception and accommodation services, along with the basic methods of training in this area, is based on the concept of a quality management system. This system is a key tool for improving service quality.
Parsuraman(2015)	Focus Roy connections Technology axis And Guest Technology	Composite - Descriptive-development	Interview and questionnaire	384 people	The Technology Readiness Index (TRI) was developed to assess the readiness of employees or guests to interact with technology. Alongside the Technology Acceptance Model (TAM), both scales are widely used in business and marketing research to examine how employees accept technology in their jobs.
Kim And et al (2008)	Behavior the reception Employees Hotel particle for direct object to systems Informational Table the reception With the reception One Model Technology wide	Quantitative-descriptive-Practical	questionnaire	320 sample members of which 253 questionnaires were obtained.	They found a significant effect of perceived information quality, system quality, and service quality on technology adoption behavior.
Ham And et al (2005)	The impact of information technology on performance in luxury hotels	Quantitative-descriptive-Practical	questionnaire	648 employees from 13 5-star hotels and 8 4-star hotels in Seoul, South Korea	They experimentally investigated the positive effects of technology applications on hotel performance. The results of that research highlighted the significance of the study's title and assumptions.

Theoretical sensitivity of hotel reception desk technology

Here is your text corrected for grammar and formatted in APA style:

In general, hotel technology includes five categories: front desk technology, back office technology, meeting and management technology, restaurant and company management technology, and related interface technology (Kim et al., 2008). Among these, the front desk refers to service interfaces at the key point of contact between employees and guests that promote value creation and value exchange (Singh, Brady, Arnold, & Brown, 2017). This includes the various technologies that front-end staff use to serve guests. This technology is generally used by employees in the front desk, checkout, housekeeping, and reservation departments and is essential for managing guest service experiences. Many hotel guests develop lasting impressions of a hotel during their initial interactions with front desk staff. Based on the pyramid model proposed by Parasuraman (2000), service marketing and management are influenced by three technology links: company-technology, technology-employee, and guest-technology. Parasuraman (2000) focused on technology-oriented communication and developed a technology readiness index to assess the readiness of employees or guests to interact with technology. Along with the technology acceptance model, both scales are widely used in business and marketing research to examine how employees accept technology in their jobs (e.g., De Jong, De Ruyter, & Lemmink, 2003; Jones & McCarthy, 2015; Walczuch, Lemmink, & Streukens, 2007).

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Although still limited, a growing number of hospitality studies focus on employee technology adoption behavior and technology performance (e.g., Kim et al., 2008; Melin-Gonzalez & Belchand-Pidomal, 2017). Kim et al. (2008) analyzed the acceptance behavior of hotel employees toward front desk information systems by adopting a broad technology model. They found a significant effect of perceived information quality, system quality, and system service quality on technology adoption behavior. Ham et al. (2005) empirically investigated the positive effects of technology applications on hotel performance. Finally, Melin-Gonzalez and Belchand-Gidomal (2017) emphasized the importance of front desk technology in predicting employee job performance related to repetitive office work.

In Kim et al.'s (2008) research, using the technology acceptance expansion model, the relationship between antecedents such as information system quality, perceived value, and user acceptance of hotel sales systems was examined. The study considered information technology as an important strategic asset for hospitality venues to improve performance and strategic competitiveness. The results showed that user acceptance and reception of hotel sales systems were influenced by external variables such as information system quality and perceived value, aiming to improve the model. Additionally, Thaghib Shimima et al. (2016) investigated how supervisory directions influence employees' goal orientation and promote

knowledge management among front-line hotel employees. They concluded that supervisory measures affect employee orientation and knowledge management, with this relationship being moderated through mediation for the purpose of support.

Service innovation master plan

Technology is a major catalyst for value creation and service innovation for hotel employees and guests. Managerial benefits and improvements in service quality through the development of work technology are key sources of service innovation (Orfila et al., 2005). Therefore, the implementation of hotel reception desk technology can be examined from a service innovation perspective. Helkkula et al. (2018) proposed four primary service innovation patterns: process-based master pattern, process-based master plan, and systemic master plan. The original process-based design depicts service as a process in the development of new services (Edvardsson et al., 2005). This plan focuses on transforming services, including any changes in the service creation process that affect the value in use, such as the roles, skills, functions, or actions of a guest or employee (Gallouj & Savona, 2009). In general, innovation precedents (Ordanini & Parasuraman, 2011), new service success factors (Melton & Hartline, 2010), and guest engagement (Allam, 2002; Blazevi, Lievens, & Klein, 2003) can be found in the original process design. From the context of technology innovation, process-based design can be explained as innovations in technology-based processes that increase the performance of existing services. The output-based design of service innovation generally examines managerial performance (e.g., profitability or sales impact) or the effectiveness of new service offerings (De Brentani & Kleinschmidt, 2004; Helkkula et al., 2018).

The key role of this master plan is to demonstrate service innovation as an economic concept in terms of measurable outcomes. According to this scheme, service innovation provides benefits to both stakeholders (e.g., guests and employees) and businesses, as value is embedded through service exchange (Grönroos & Voima, 2013). The original design based on the output of hotel reception desk technology focuses on hotel service performance and is enhanced by the adoption of new technology for guests and service providers. Therefore, this study focuses on how technology innovation has increased labor productivity, guest interactions, and service performance. Given its primary focus on technology adoption and performance, existing research has primarily examined process and output-based primary patterns (Helkkula et al., 2018). By comparison, their distinctive patterns have attracted less innovation research. The root of empirical and systematic data theory is the logic governing services (Vargo & Lusch, 2004) and the service ecosystem (Wieland et al., 2012).

The main experimental design is based on the phenomenological understanding of individual and subjective service experiences. The goal is to understand how guests perceive value with technology innovations (Helkkula & Holopainen, 2011). Shin and Perdue (2019) argue that more research needs to focus on how the experiential value associated with new

hospitality technology is created for guests and employees. In this regard, the adoption of front desk technology will affect both the guests' and the staff's service experiences; empirical value has been established for both parties (Larivière et al., 2017). For example, the work efficiency created by advanced technologies can allow hotel guests to experience faster processes and customized service experiences through greater interaction with employees. The inclusive master plan takes a holistic perspective to understand the processes and outcomes associated with technological innovation (Helkkula et al., 2018). While the main focus of this design is to link resources, actors, and organizational structure in a service ecosystem, this research views structural design as an integrated and systematic approach to understanding the processes, effects, and experiences associated with new technology. Most research has considered technological innovation as a single entity affecting specific stakeholders (e.g., guests, employees) or performance (e.g., technology adoption, financial performance; Ham et al., 2005; Melián-González & Bulchand-Gidumal, 2017). According to the mentioned materials, the present research aims to present the technology innovation model of the reception desk of hotel services in Iran, based on the studies, foundations, and background of the research.

Methodology

Since this research employs an inductive approach and seeks to explore a new topic, it is classified as qualitative research. The research strategies applied in this study are as follows. First, a systematic review method was utilized to thoroughly and systematically examine the existing literature from an inductive perspective. Subsequently, based on the findings from the systematic review, the structures and components were extracted from the studies using qualitative coding methods.

Systematic review method and steps

A systematic review is a method that seeks to answer a question or questions raised in the research through a systematic review of existing literature. A systematic review is the best method through which the factors and mechanisms affecting the formation of the technology innovation model of the front desk of hotel services in Iran can be identified. In this method, the process involves first identifying research results pertinent to the research question, and then selecting and synthesizing these findings. To achieve this, the relevant literature was systematically reviewed and revised over approximately one year.

1. First Step: Defining the Research Scope
2. Second Step: Refining the Research Question
3. Third Step: Aligning the Research Question with the Research Plan
4. Fourth Step: Developing the Research Program and Background
5. Fifth Step: Extracting Relevant Data from Articles

To explain the methodological characteristics of this research, Saunders, Lewis, and Thornhill's (2007) research onion framework has been employed. Although Saunders and his colleagues' model does not explicitly mention interpretivism as a research philosophy or the inductive method as an approach to theory development, these elements have been incorporated into the model based on the requirements of the current study (Danaei Fard et al., 2018).

Table 2. Description of methodological characteristics of the research based on the research onion model

Research Layer	Title Method
Research Philosophy	Interpretive
Research Approach	Inductive
The Research	Mono Qualitative Study
Research Strategies	Systematic Review
Time Horizon	Cross-Sectional
Analysis Methods	Qualitative Coding

Based on the contents of Sadr al-Ashara, the reasons for choosing each approach can be outlined in relation to the research questions. For the question of identifying the factors in the technological innovation model of hotel service reception desks in Iran, it is necessary to examine existing research and draw inferences from it. This will lead to an inductive result. The systematic review method, utilizing qualitative coding tools, will be the most effective approach. The components of eligibility determination include: 1. Population, 2. Intervening factors, 3. Control and comparison, and 4. Consequences and contexts. These components are described in Table 3 and their relevance to our research is reflected accordingly.

Table 3. describes the components of the PICO model and their application in future research

Name of the component	Application of the components in the upcoming research
Population	1. Desired characteristics: innovation models of front desk technology for hotel services in Iran 2. Number of reviewed articles and studies: 135 Number of systematic review articles and studies: 54
Interfering Factors	The issues surrounding the discussion of the technology innovation model of the reception desk of hotel services in Iran are centered on the following issues: 1. In the existing literature, what factors, processes, and steps are mentioned that lead to the formation of the mentioned pattern and affect it? 2. Based on the findings of previous studies, the success of the technology innovation model of the front desk of hotel services in the field of tourism accommodation services and the improvement of their performance as well as the improvement of the quality of the said model are influenced by what factors? 3. What mechanisms and components does the technological innovation model of the hotel service reception desk in Iran include, and do each of these identified factors affect which of these components and mechanisms?
Comparison	In this research, the opinion that we do not intend to perform this action, as a result, will be ignored from now on.
Outcomes	1. Determining the process model (in such a way that it contains all the factors and steps) on which the technology innovation model of the reception desk of hotel services in Iran is formed. 2. Determining the effective factors on the technological innovation model of the front desk of hotel services in Iran and improving their performance as well as increasing the quality of the model 3. Determining the mechanisms that the technology innovation model of hotel service desks in Iran has and the factors affecting them
Context	The territory under our investigation is the tourist accommodation environment because the researcher considers selected hotels.

All quantitative, qualitative, and mixed articles that dealt with the subject of hotel reception desks were examined as the basis of the systematic review. In Table 4, the inclusion criteria of the study that were the basis of this research are mentioned:

Table 4. Inclusion and non-inclusion criteria, the range of inclusion criteria_a

Area	Inclusion criteria
Basic and basic criteria	Looking at the issue of technological innovation of the reception desk of hotel services in all types of accommodation units Factors related to service desk technology innovation
Subjects studied	Examining the following issues in the technology innovation of the reception desk of hotel services in a specific way: Failure and success factors Control systems at the reception desk of the desired hotel services and its relationship with the issue of technological innovation Factors, processes, and mechanisms that form and affect the technological innovation model of hotel service reception desk. Constituent components of the hotel service reception desk technology innovation model Specifications and requirements that form the innovation model of hotel reception desk technology.
Scope of the Intended Study	Four and five-star national and international hotels and accommodation units
Methodology	Quantitative, qualitative, and mixed studies
desired results	A model showing how to form a technology innovation model for hotel reception desk services
Type of desired articles	Scientific research and review
The desired amount of credit	Included in the world's most reliable scientific databases...

Results

In this part of the research, which encompasses two stages of systematic review, open coding tools will be employed for analysis in both stages. Additionally, in the second stage, the method of following the Ali process combined with a systematic theorizing approach will be utilized.

Systematic review

According to the figure below, the frequency chart of the research designs used in the previous related research was determined and is presented in the following figure.

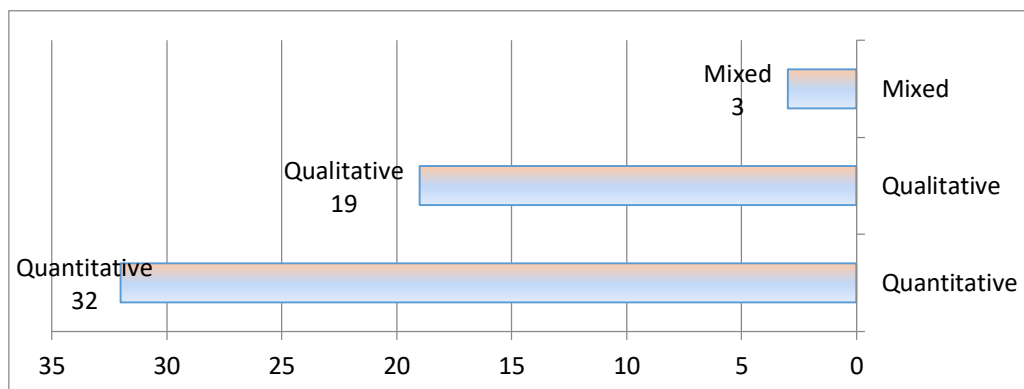


Figure 1. Frequency chart of research projects

Additionally, based on the nature of the articles, a frequency chart of the dimensions of the current research, as compared with previous related studies, is presented as follows.

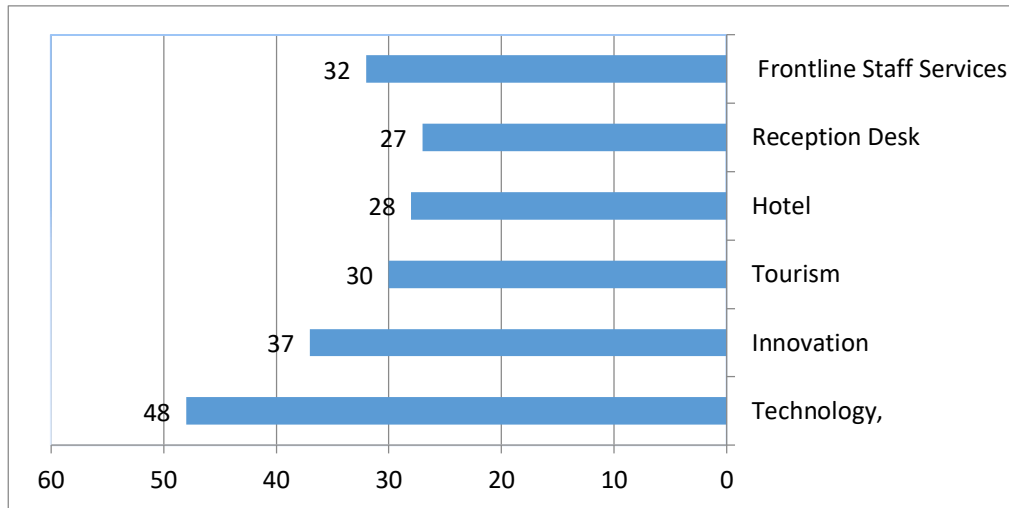


Figure 2. Frequency diagram of the dimensions of the current research

Components of the hotel reception desk technology innovation model in Iran based on systematic studies

In this section, based on the systematic review method and according to the studies that were selected for this research, the factors that make up the technology innovation model of the front desk of hotel services in Iran were identified, based on which 54 studies were selected and a total of 295 open codes were identified. Based on these codes, 15 subcategories and 4 main components were identified and categorized. The details of these open codes, including the structures and components, are presented below and will be elaborated in the next section with the specific coding logic provided by the researcher.

Table 5. Components of the technological innovation model of the reception desk of hotel services in Iran

Components of the technological innovation model of the reception desk of hotel services in Iran		
Categories	subcategories (structures)	codes (components)
Residential internet services	Website security	A1C1-A2C2-A1C4- A1C2- A20C4
	Development of website services	A1C3 - A1C4 - A1C9 - A1C10 - A1C11 - A1C5 - A1C7 - A2C3 - A2C4 - A5C4 - A6C3 - A24C6 - A53C12
	Information Technology	A11C1-A24C4-A24C5-A36C4-A41C1- A41C4- A11C2- A41C5- A48C1-A53C7- A53C9 A12C1-A39C1-A15C1- A39C2-A39C3- A41C8 -A15C2-A15C3-A27C4- A31C2-A32C2-A53C19-A53C20-A27C7-A31C3-A32C3-A53C21- A24C7-A27C5 - A31C1- A32C1 A27C6- A31C4 - A31C5 - A17C2 - A17C3 - A20C1- A17C4- A24C3- A18C1- A18C2-A18C3- A18C4- A20C2 - A20C3 - A26C3 - A47C7- A27C1- A1C8- A27C2- A29C1- A29C2- A29C3 - A29C4- A29C5 -A29C6- A29C7- A29C8- A29C9
	Information technology and reservation	A26C7-A26C8-A26C9-A38C1-A38C2-A24C1-A24C2-A52C1
	New technologies and their innovation	A3C1-A3C2-A3C3-A6C1-A6C2-A6C4-A7C1-A7C2-A7C3-A7C4-A7C5-A13C1- A13C2-A34C1-A34C2-A34C3-A34C4-A35C1-A35C2-A37C1-A37C2-A37C3- A37C4-A12C2- A45C1-A45C2-A49C2- A49C5-A54C1
	Smart innovation	A42C1- A42C2- A42C3-A47C8-A52C13-A52C14
Hotel human resources	Professional development of employees	A4C1-A21C1-A22C1-A40C1-A53C8-A53C14-A53C15-A53C16-A53C17-A53C18- A21C3-A10C2-A22C3-A21C4- A22C4- A21C5- A41C3- A4C2- A13C3- A16C13- A17C5-A22C2- A19C1- A21C2- A5C1- A10C4- A11C4- A43C2- A46C3- A46C14- A53C1-A53C2-A53C3-A53C4-A53C5 -A53C13- A4C3-A4C4-A10C-A19C2- A10C3- A19C3-A28C1-A28C2-A46C2-A28C3-A11C4-A19C5-A48C3-A48C4-A48C6- A48C7- A48C8-A48C9 -A50C4-A53C24
	Analysis of the behavior of service desk personnel	A25C1-A25C2-A25C3-A25C4-A25C5-A41C2-A51C1-A51C2
	Characteristic and behavioral strategy of service desk staff	A9C1-A9C2-A9C3-A9C4-A15C4-A16C1-A16C2-A16C3-A16C4-A16C5-A16C6- A16C7-A16C8-A16C9-A16C10-A16C11-A16C12-A46C4-A46C5-A46C6-A46C7- A46C8-A46C9-A46C10-A46C12-A46C13-A47C2-A47C3-A47C4-A47C5
hotel management	Strategies	A11C3-A12C3-A14C1-A14C2-A5C5-A19C4-A36C1-A42C4-A36C3-A44C1-A44C2- A44C3-A46C11-A54C3
	Research and Development	A26C2-30C1-A30C2-A36C2-A40C4-A40C5-A41C6-A43C1-A45C3-A47C1-A48C5- A48C10-A49C1-A49C4-A50C1-A50C2-A52C3-A52C7-A52C8-A52C9-A52C10- A52C11-A52C12-A53C6-A53C10
	Management duties	A50C3-A53C11-A54C2
	Management style on employees	A5C2- A5C3- A13C4 - A21C6
guest	Feedback from the customer (guest)	A1C6-A2C1-A17C1-A23C1-A33C2-A40C2-A40C3-A43C4-A52C4-A52C5
	Serving guests	A8C1-A26C1-A26C4-A26C5-A26C6-A48C2-A53C26-A27C3-A33C1-A38C3- A43C3-A46C1-A47C6-A49C3-A49C6-A52C2-A52C6-A53C22-A53C23-A53C25

Discussions and Conclusion

Examining integrated and comprehensive management processes and the effects related to new technology is essential for understanding the strategic concepts of table-service technology innovation. The proposed framework offers a model for developing and managing front desk technology by critically analyzing specific operational processes, outputs, and experiential values associated with the technology. As an exploratory study, this research seeks to establish three fundamental roles in hotel technology research. While technology innovation in the workplace can provide significant insight into the effectiveness of services and experiences (Rafaeli et al., 2017), most existing hospitality research has focused on technology implementation with a focus on the relationship between technology and employees (e.g., Kim et al., 2008).

Building on the work of Law and Jogaratnam (2005), further research was necessary to explore how hotel managers comprehend and integrate technology into their operations. To address this, a qualitative study was conducted to gain insights into how hotel managers manage the effects of front desk technology innovation in hotel services. This provides a company-wide strategic view of hotel front desk technology using the core model of service innovation (Helkkula et al., 2018). The process, output, and the main and systematic plan provide a broader management perspective to the successful management and development of service desk technology.

This study provides a management framework for understanding the effects of desk-service technology innovation and guidelines for the management and development of desk-service technology. This research highlights the crucial role of ease of use and perceived usefulness in the technology adoption process, emphasizing these factors within a qualitative approach. The Technology Acceptance Model (TAM) posits that both ease of use and perceived usefulness significantly influence a user's acceptance of new technology (Venkatesh & Davis, 2000).

In the hospitality industry, Kim et al. (2008) emphasized that the administration system should be easy and convenient to use. This study not only supports previous findings but also identifies specific factors for successful user adoption. For instance, a user-centered design and integrated functions allow employees to use technology seamlessly, enhancing their role flexibility. This flexibility enables hotels to effectively manage front desk operations during busy periods by reallocating staff from other departments. Additionally, an integrated web-based platform improves information accessibility, resulting in more reliable and informative services (Bitner et al., 2000; Ham et al., 2005), and ultimately boosts employee productivity (Kim et al., 2008).

These factors are not only effective for desktop technology operations, but must also be considered for successful technology development. In addition, this study shows that the introduction of new technology in the workplace can have a greater impact on human

resource management practices (Delid Luis, 2005; Jimenez-Jimenez and Sanz, 2005). Front desk technology is impacting employee training and hiring processes. Most training related to the hotel industry, on the job, ease of learning, and reduced training time lead to more employee motivation to adopt new technology (Law and Jogaratnam, 2005). Additionally, easy technology training was found to change the hiring process; Hotel recruiters can focus more on an applicant's soft skills, including communication and interpersonal skills, rather than technical skills and knowledge.

The study's results shed light on how technologies influence employee experiences. While previous research has indicated a positive connection between technology development and service experiences (e.g., Chatot, 2007; Lau and Jugartnam, 2005), the current findings further demonstrate how technology enhances service delivery and reception experiences. Unlike the majority of research that focuses on "services with technology" and "high technology" (Bitner et al., 2000), this study introduces a fresh perspective on "new technology encounter and low encounter."

From a hotel's standpoint, employees play a critical role in determining service quality and guest satisfaction. Consequently, hiring and training qualified employees are pivotal practices in the hotel industry (Haynes and Fryer, 2000; Ottenbacher and Gnoth, 2005). In this context, advanced recruitment and training technologies significantly impact the quality of guest service experiences.

For successful technology development, it is essential to understand the mechanisms by which technology affects managerial efficiency and guest service. In this context, the proposed framework can be used to guide the development and evaluation of new technologies. To be more precise, the developer needs to recognize the potential managerial benefits of new technologies, including personality-based recruitment, and effective training, to increase service quality. In addition, technology must be efficient and fast to allow employees to perform their various tasks and have more time to interact with guests. The proposed framework helps hotel managers to understand the potential effects and costs of technological innovation. They must create technologies that effectively integrate with existing technologies and existing databases. In addition, it is important to understand the concepts of technological innovation in staff recruitment and training processes. Effective technology not only reduces the burden of hiring employees with technical knowledge but also reduces the time and cost of training. For hotel staff, technologies that are easy and efficient help them interact with guests and provide better service. Employees are often hesitant to adopt new technology if it is difficult and time-consuming to understand. However, higher levels of employee technology adoption can ultimately increase service transfer and productivity, leading to higher satisfaction ratings (De Jong et al., 2003). Effective technology can improve the service performance of employees, giving them more time to interact with guests and provide personalized service effectively.

Research limitations and suggestions for future research

Despite the comprehensive efforts to gather reliable data, this research was subject to certain limitations that may have influenced the accuracy and generalizability of its findings. Cultural factors, which play a significant role in technology acceptance, were not fully explored. The rapidly evolving nature of technology posed challenges in ensuring the timeliness of findings. Additionally, the study may not have fully accounted for the impact of existing regulations and policies on technology adoption. The financial implications of implementing new technologies were not thoroughly analyzed. Moreover, accessing reliable data on current technology usage and guest preferences in Iranian hotels presented limitations. By focusing on front desk operations, the interconnectedness with other hotel departments was overlooked. Finally, the limited timeframe of the research restricted longitudinal analysis.

To address these limitations and enhance technology innovation in Iranian hotels, several practical suggestions can be implemented. A comprehensive needs assessment should be conducted to pinpoint specific technological gaps within Iranian hotels. Benchmarking against global standards, particularly in similar socio-economic contexts, can provide valuable insights. Targeted training programs for hotel staff are essential to ensure proficiency in using new technologies. Pilot programs can be initiated to test proposed innovations before widespread implementation. Mobile integration, leveraging data analytics, and fostering stakeholder collaboration can further drive innovation. Cultural considerations and regulatory frameworks should be carefully evaluated to ensure successful technology adoption. Measuring impact and adapting strategies based on the results will contribute to a continuous improvement process.

By adopting these recommendations, Iranian hotels can develop a comprehensive approach to technology innovation, effectively tackling operational challenges while enhancing guest experiences. This strategy will position Iran's hospitality industry to compete more effectively in the rapidly evolving digital landscape.

Conflict of interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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