

THE IMPACT OF IOT ON TOURIST SATISFACTION: THE MEDIATING ROLE OF HRM CAPABILITIES IN THE HOTEL INDUSTRY

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Abstract: This study aims to investigate the impact of Internet of Things (IoT) adoption on tourist satisfaction in the Saudi Arabian hotel sector, focusing on the mediating role of Human Resource Management (HRM) capabilities. It examines how internal HR enablers translate technological investments into improved service outcomes. Grounded in the Resource-Based View (RBV), the research utilizes a quantitative approach through a structured questionnaire distributed to hotel staff and guests across major Saudi cities. Structural equation modelling (PLS-SEM) was employed to test hypothesized relationships among IoT adoption, HRM capabilities, and tourist satisfaction. The findings reveal that IoT adoption significantly enhances tourist satisfaction. HRM capabilities mediate this relationship, although not all direct effects were statistically significant. Key enablers such as Just-in-Time (JIT) training, performance trends, and smart workplace infrastructure contribute meaningfully to developing HRM capabilities, which in turn influence customer satisfaction. Research limitations/implications – The study's cross-sectional design and use of convenience sampling limit the generalizability of findings. Additionally, relying on self-reported data introduces the possibility of response bias. Future research should consider longitudinal designs and alternative mediating variables. The results emphasize that technological investment alone is insufficient to enhance service quality. Hotel managers must align HR strategies with digital transformation by investing in staff training, adaptability, and digital readiness to unlock the full potential of IoT innovations. This study integrates HRM theory and IoT innovation within the RBV framework, offering a comprehensive model that clarifies the mediating role of human capital in digital transformation. It contributes to the literature by bridging the gap between technological adoption and organizational capabilities in service-intensive industries.

Keywords: HRM Capabilities, JIT Training, Performance Trends, Smart Workplace Infrastructure, Tourist Satisfaction

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INTRODUCTION

A key component of Saudi Arabia's strategic goal of encouraging economic diversification under Vision 2030 is the country's expanding tourist industry (Jahmani et al., 2023; Jawabreh, 2020). The hospitality sector has emerged as a key component of this national change, with the goal of hosting more than 100 million visitors yearly by the end of the decade.

Despite improvements, the hotel industry still struggles to continuously satisfy visitor expectations in a world that is becoming more and more digital (Arshad et al., 2024; Ahmad, 2023). Nearly 74% of foreign visitors now anticipate digital services throughout their hotel stay, according to the World Tourism Organization (2023), which has prompted operators to implement cutting-edge technology to satisfy growing needs. The Internet of Things (IoT) has been recognized as a crucial technology among these solutions for improving guest services' responsiveness, operational efficiency, and customization (Allahham et al., 2023). To improve efficiency and customize the visitor experience, major hotels in Riyadh, Jeddah, and Makkah have implemented IoT-enabled technology, including voice-based services, temperature controls, controlled lighting, and mobile check-ins (Ibeh et al., 2024). The goals of these solutions are to provide a personalized passenger experience, reduce service delays, and boost convenience. However, better visitors' outcomes are not always guaranteed by technology alone (Kumawat et al., 2024). Service quality may deteriorate rather than increase in the absence of skilled workers and efficient HR processes to facilitate the adoption and use of digital tools. HRM competencies, including staff training, digital literacy, and flexibility, are essential facilitators that convert technology expenditures into higher levels of

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visitor satisfaction. Although there is a growing body of research on IoT in the hotel industry, it often focuses only on adoption frameworks or consumer reactions to certain digital features (Dwivedi et al., 2022).

Thus, in determining the relationship between IoT deployment and visitor happiness, the organizational enablers included in HRM systems—such as leadership behaviors, structural alignment, and knowledge retention—are often disregarded. Technology and human resource elements are often isolated in existing studies, ignoring their interaction in determining service results. As a result, our knowledge of how cutting-edge technologies are used in service-intensive sectors like hospitality is lacking. By connecting digital innovation to internal organizational skills within the hospitality sector, the present research aims to close this gap by examining how HRM capabilities mediate the connection between IoT-based innovation and consumer satisfaction in the Saudi hotel business (Al-Romeedy & Alharethi, 2025).

By highlighting HRM's function as a mediating factor via which digital technologies impact guest outcomes, this study builds on earlier studies. Practically speaking, the study provides insightful information for scholars, hotel owners, legislators, and Saudi Arabian tourist planners who are working to create a service-oriented, internationally competitive tourism sector (Zhang, 2024). Three primary objectives form the framework of the research. In the Saudi hotel industry, it first investigates the direct impact of IoT deployment on visitor pleasure. Second, it assesses how HRM skills enhance service delivery within the framework of an IoT-enabled environment. The influence of IoT deployment on perceived visitor satisfaction is examined in the third and fourth sections, along with the potential mediating role of HRM capabilities. Hotels are there to meet the needs of their customers. The hotel industry's priority is the comfort of its guests.

The care that hotel staff feel for their visitors is at the heart of the hospitality sector. Customer contentment is the state of a client's mental, physical, and emotional health. This kind of satisfaction is easily obtained when service providers provide items or services that surpass their consumers' expectations. Offerings from the sector may increase consumers' positive feelings and turn them into loyal clients who will return time and time again. At the very least, positive word-of-mouth from such a consumer would "trial" more potential customers. However, service that fails to meet expectations may easily reduce such satisfaction and have a negative effect on a client's attitude. These clients are now rather vocal and quick to go to other companies; a "disaster" experience might lead to bad word-of-mouth.

The following research questions are used to accomplish these goals:

RQ1: How much does IoT deployment affect Saudi hotel guests' satisfaction?

RQ2: How do HRM capabilities and IoT deployment relate to hotel operations?

RQ3: Does the link between IoT usage and visitor pleasure become mediated by HRM capabilities?

The research offers several significant insights. The research theoretically builds a comprehensive model for analyzing hotel service performance by fusing human resource theory with technology management (Al Fahmawee & Jawabreh, 2022). By presenting HRM as a mediating component as opposed to a passive background function, it fills a gap. This approach makes it clear how internal organizational competencies may improve the returns on investments made in digital technology. Practically speaking, hotel managers who want to improve visitor happiness by coordinating HR procedures and technological advancements will find great value in the study's conclusions. By emphasizing the internal forces behind the sustainable digitalization of services in the hotel industry, it contributes to national tourist development plans. Using questionnaires given to hotel staff and visitors in four major Saudi cities, this research uses a quantitative approach. This approach methodically looks at how technology, human skill, and customer pleasure interact while providing services. A study of the literature on IoT applications in hospitality and HRM capabilities makes up the rest of the article.

LITERATURE REVIEW

1. HRM Capabilities and Smart Workplace Infrastructure

Based on the resource-based view (RBV), human capability, as one of the primary internal resources, is fundamental to the distinction of competitive advantage (Sharma & Rishi, 2024). In technology-supported service settings, such as the hotel industry, HRM capabilities include recruitment systems, digital training systems, performance appraisal, and the ability to adapt to emerging technologies (Chuang, 2023). Innovative office technology, such as IoT-based systems, only operates successfully with a workforce trained and available to use, maintain, and improve such systems in pursuit of strategic aims (Vaishnavi et al., 2025). Digitally literate staff are key to quickly providing guests with the information they need and resolving issues promptly. As an organization's technology partner, HR investigates how a heavy dependence on AI-based technologies changes the function and potential of HRM. It is suggested that this dependence results in deficiencies in HRM competencies. It is hypothesized how intelligent HRM capabilities and smart workplace infrastructure address these HR shortcomings using a strategic need–technology affordances paradigm. Some traits that characterize smart workplace infrastructure and intelligent HRM capabilities are identified via interviews on insights into building, developing, and deploying AI. All things considered, new AI capabilities provide new operational strategies and new functions for the HRM field. The operationalization of HRM activities in performance-oriented vs. people-centered organizations is described in this exploratory research. AI will become more and more important for success in the digital economy as it becomes the next layer of technology that pervades organizations. Studying the features of AI-enabled HRM capabilities and how they alter HRM's function in organizations is now crucial for HR. Theoretically, artificial intelligence (AI) is a system that can carry out activities that have historically needed human intelligence on its own, without direct human interaction. Since the effectiveness of their design and execution may provide significant strategic risks and possibilities for both organizations and people, this investigation focuses on AI systems that process, understand, and produce natural language in its widest meaning. By facilitating the scalability and learning curve of predictive, prescriptive, and cognitive skills, converting data and events into actionable information is expected to expand HRM's present capabilities.

Given the development of process-centric HRM, which automated administrative, transactional, reporting, and operational skills, this once-in-a-century change is noteworthy. The design and implementation depth of organization-focused, process-centric HRM solutions became more and more crucial to the milestones of digital HRM. It is anticipated that these HRM stages will usher in a new era when workforce-centric HRM solutions powered by AI will convert observable data and events into actionable information for users, workers, managers, applicants, teams, and, eventually, organizations. Research tends to ignore the mediating role of HRM in translating technology investment into guest satisfaction. Therefore, we hypothesise that:

H1: The adoption of IoT has a significant positive impact on HRM capabilities.

2. HRM Capabilities and Tourist Satisfaction

Tourist satisfaction in the hotel industry is increasingly influenced by the frontline staff's performance and efficiency, which is related to their competence and performance. Technologically developed environments require HRM practices capable of supporting the quality of service, such as empowerment, task complementarity, and pay-for-performance, to improve customer experiences in tech-integrated interactions (Lima et al., 2023). From the RBV perspective, HRM is not only a support to the organization but also a strategic resource that helps the brand better satisfy and surpass guests' expectations. Studies in hospitality demonstrate that skilled employees can impact hotel scores, particularly in responding to adverse situations and interacting with digital interfaces (Tian & Tang, 2025). HRM has evolved over the last several decades from a bureaucratic administrative function that was primarily concerned with problem-solving to a strategic one that empowers businesses to utilize organizational culture and people's capital to create and maintain competitive advantage. The advent of affordable Smart Workplace technology in recent years has created a wealth of potential for designing workplaces that promote increased engagement, productivity, and well-being. To fully exploit the promise of a smart workplace, the HRM function must create advanced operational and cultural competencies, which have been largely ignored in the literature on smart workplaces. By describing and offering empirical support for the array of HRM capabilities that need to be developed and matched with workforce management technologies to fully realize the potential of a smart workplace infrastructure, this paper adds to the literature on both strategic HRM and smart workplaces. The performance of the three nested subsystems of HRM capabilities - administrative, core people, and improvement - is influenced by eleven different HRM practices that contribute to the complex capabilities under study. According to some, a smart workplace's collaboration culture and climate are essential to realizing its full potential. Additionally, the research potential and practical consequences pertain to the important strategic management solutions that firms must implement in order to fully benefit from a smart workplace (Li et al., 2024; Al Fahmawee & Jawabreh, 2023). Workplace management technologies, which include the provision and configuration of both digital and physical workplace infrastructure, can facilitate increased workplace productivity through automated compliance, work prioritization, real-time data-driven workload distribution, employee monitoring, enhanced advanced ergonomics, and more. Through a range of experiences made possible by environmental and well-being technologies, they may provide a chance to improve employee engagement and well-being while reducing the negative consequences of hybrid working on these factors as well as productivity. According to research, organizations must establish and implement consistent HRM policies, practices, and processes to create the multifaceted HRM skills that are required, even though technologies by themselves cannot provide the desired results. Accordingly:

H2: HRM capabilities have a significant positive effect on tourist satisfaction.

3. Just-In-Time (JIT) Training and HRM Capabilities

Just-in-time (JIT) training is a type of training that is given at a very close time to, or even on, the job. This training particularly applies to fast-changing technology environments where new systems and tools are constantly introduced (Jawabreh & Fahmawee, 2024). From a resource-based view (RBV) perspective, dynamic learning processes such as JIT training are one of the firm's resources and organizational capabilities that are not only valuable in making employees more adaptable and reducing service delays, but also in enhancing operational sustainability. Examining HR training in Saudi hotels, where the uptake of organizational capability for digital transformation is mixed, JIT training contributes to the HRM system by increasing agility and operational sustainability. Therefore, we hypothesize:

H3: Just-in-time training has a significant positive effect on HRM capabilities.

4. Smart Workplace Infrastructure and Tourist Satisfaction

The intelligent workplace infrastructure includes innovative check-in systems, energy-efficient lighting, occupancy sensors, and AI-powered concierge service, among other IoT features. The aim of these systems is to enhance convenience, privacy, and responsiveness, all of which have a significant impact on tourist satisfaction (Jawabreh et al., 2021).

Empirical evidence demonstrates that suite quality, when combined with service delivery as an enhancement, enhances guests' loyalty and word-of-mouth. However, infrastructure alone is insufficient; its effectiveness depends on how well it is integrated and utilized in service delivery (Alramamneh et al., 2025). Virtual reality (VR) has the power to directly influence people's experiences and radically alter the way they operate. Although VR has mostly been used for gaming and amusement so far, applications for education and training are starting to appear. This effort aims to demonstrate that office workers may be provided with VR productivity tools that enable them to work (nearly) anywhere and at any time using only a head-mounted display (HMD) and portable conventional input devices. While VR's benefits provide new possibilities for workplace settings, its drawbacks force a reevaluation of working procedures to minimize productivity losses. The office workers of the future will be able to operate efficiently wherever. They will be utilizing an immersive head-mounted display (HMD) on standby and a portable standard input device (such as a laptop keyboard and mouse) with a certain amount of confidence. When moving to various humorous real-world scenarios with restricted resources, the portable standard input devices will be enough for editing

important papers and communicating via instant messaging. To establish an office working environment of their choosing without having to carry a real workstation, their HMD will be switched on, spatially monitored, and utilized in combination with the regular input device when they reach a spot that permits continuous work. Strategic capabilities enhance infrastructure, which the RBV conceptualizes as a physical resource (Pasquinelli & Trunfio, 2023). Based on this reasoning:

H4: Smart workplace infrastructure has a significant positive effect on tourist satisfaction.

5. IoT Adoption and Tourist Satisfaction

The technology deployed in IoT in the hospitality sector provides an interactive and personalized experience, which has transformed the way tourists interact with hotel services (Monteiro et al., 2024). This extends to in-room automation, tailor-made service recommendations, and predictive maintenance that minimizes service downtime (Al-Yousef et al., 2025).

Research findings in hotel management validate that adopting IoT technology positively affects overall guest satisfaction through enhancements in convenience, control, and personalization. From the RBV point of view, IoT is a resource that allows firms to distinguish and innovate in their services (Jawabreh et al., 2024). A greater interest in e-Tourism practices is seen in the quick use of information technologies (IT) by knowledgeable tourists to aid in their trip planning.

The adoption of electronic services and Internet use in the travel industry has seen shocking development. But as travelers grow more adept at using IT tools and become more sophisticated consumers, technology-intensity models capture too basic views of user behavior, portraying e-Services, e-Tourism services, and e-Tourism processes as one-dimensional and anticipating a single point of adoption. Travelers' behavior and the tourist processes they participate in are anticipated to change in tandem with the evolution of IT in tourism, as is the case with other information systems. It is projected that "smartness" and artificial intelligence (AI) technologies will significantly alter the post-pandemic tourist landscape considering current occurrences like the 2019–20 pandemic and the heightened occurrence of climate change. A system is said to be smart if it has a greater knowledge of its surroundings and the ability to interact with them dynamically.

In this context, artificial intelligence (AI) refers to a group of systems that are thought to be smarter than earlier IT paradigms. These systems have the capacity to learn about the system or its user, reduce user preferences, and provide suggestions. Voice-interaction systems and procedures will serve as the foundation for the deployment of AI and smart technologies. Travelers' opinions and travel preferences will be gathered in order to provide relevant travel deals and merchandise. Voice-interaction system adoption will be aided by several variables, including IT technologies that facilitate these procedures (Jawabreh et al., 2023). The effect of 5G networks on processor performance, such as in smartphones, and on the processing capacity provided by cloud computing are two examples of technical advancements that will result in a greater use of voice interaction. It is processing, that these developments would close the hardware standard gap in developing economies, primarily by providing end users with more affordable devices that will also have more capacity, therefore resolving the performance problem. Another aspect is the current outbreak, which sparked questions about how clean shared touch surfaces are and may cause a shift away from touch-interactive computer interfaces in society.

During this period, voice-activated personal gadgets will be increasingly widely adopted. Voice-interaction technology will be used to create permanent travel aids. Therefore, we hypothesize:

H5: The adoption of IoT has a significant positive effect on tourist satisfaction.

6. HRM Capabilities as a Mediator

It is not guaranteed that IoT directly leads to customer satisfaction, which mainly depends on how service personnel, responsive service policies, and knowledge sharing are used. HRM capability is the internal link between technical infrastructure and service delivery. Focused mediated models in OB indicate that when HR systems are aligned with technology deployment, they are associated with higher levels of customer feedback and performance enhancements. Consistent with RBV theory, HRM is an ameliorative resource that converts the resource potential of the IoT into operational value (Oliveira et al., 2025). Hence, we propose:

H6: HRM capabilities mediate the relationship between IoT adoption and tourist satisfaction.

This research applies the RBV framework to illustrate IoT systems, HRM capabilities, and smart infrastructure as organizational resources and to link tourist satisfaction to these resources. The theoretical model in the current study posits that HRM acts as an enabler, as well as an intermediary, for the impact of technology on user experience (Oliveira et al., 2025). This work fills a gap in the literature, where these are frequently analyzed separately (Nyongesa & Van Der Westhuizen, 2024). This study's unique synthesis of JIT training, performance trends, HR, and technology adoption provides a comprehensive understanding of satisfaction outcomes in the Saudi hotel indust

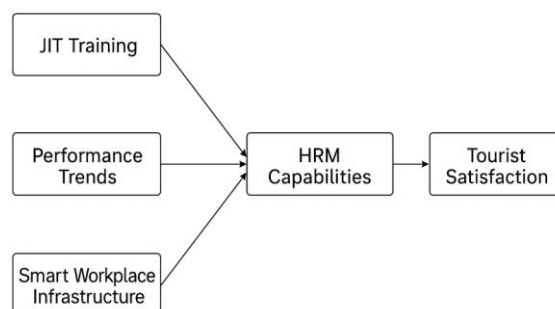


Figure 1. Research Model

METHODOLOGY

1. Justification for the Methodological Approach

Using a positive methodological approach, the objective was to test the links between latent constructs through an empirical process and to verify causal relationships using a structural equation model. The study is based on the Resource-Based View (RBV), which highlights those internal firm capabilities, such as HRM capabilities, that enable firms to capitalize on external technologies, like the Internet of Things (IoT), for improved performance outcomes, including tourist satisfaction. In the emerging empirical research on integrating IoT and HRM enablers in the Saudi Arabian hotel industry, a quantitative approach was selected to measure and test the hypothesized relationships objectively.

2. Research Questions and Hypotheses

The research question addressed in this study is as follows:

Q1: What is the relationship of IoT applications on tourist satisfaction, and what is the mediation role of HRM capabilities in this relation among Saudi Arabia's hotel industry?

Q2: What is the impact of individual elements of IoT-based systems on the development of HRM capabilities?

To answer these questions, this research presents a model comprising seven hypotheses. These hypotheses test the direct effect of the technological constructs of the Internet of Things (IoT) on Human Resource Management (HRM) capabilities and tourist satisfaction, as well as the mediating role of HRM (Vujičić et al., 2024). The integration of IoT in hotel operations is expected to result in enhanced HRM practices, including employee readiness, learning orientation, and digital interaction. These enhancements are further assumed to raise, particularly the general level of guests' satisfaction with the hotel.

3. Research Design

This study adopts a cross-sectional survey design, conducted at a single hotel within the broader Saudi Arabian hotel sector. This approach is appropriate for examining structural relationships using Partial Least Squares Structural Equation Modeling (PLS-SEM). A structured questionnaire was utilized as the primary data collection tool to ensure consistent and reliable measurement of latent constructs. Using established standard scales. The design also aligns with the Resource-Based View (RBV) principles, as it enables the empirical investigation of the relationship between firm-specific resources, technological systems, and their influence on customer-centered outcomes.

4. Population, Sampling, and Ethical Considerations

The population comprises mid-level management and human resources officials of 3–5 5-star hotels in Riyadh, Jeddah, Dammam, etc. Non-probabilistic convenience sampling was used as it was easy to access and the expertise needed was targeted. While this restricts generalizability, it assures a knowledgeable population regarding IoT use and HRM processes. The ethical code was observed in all stages of the study. All subjects were required to give their informed consent and were allowed to revoke it at any time. The responses were anonymous, and the university's institutional review board approved the study.

5. Data Collection Procedure

Online channels and internal hotel HR networks were used to disseminate the survey. A cover letter with information describing the study's intent, the voluntary nature of participating, and the confidentiality guarantee was inserted. Causal relationships were tested with a time-lagged design; we took the time gap between independent and dependent variables into consideration; this procedure helped us minimize common method bias.

6. Measurement of Constructs

All variables were assessed on a 1-5 Likert-type scale (1 = strongly disagree, 5 = strongly agree). Constructs include: · Implementation of IoT: Adopted from established scales for measuring the adoption and integration of technology in the service industry. · HRM Capabilities: Assessed by items reflecting talent acquisition, training, flexibility, and adaptability. Tourist Satisfaction: Taken from existing literature on customer satisfaction measurements in hospitality. Experts checked the content validity of the instruments for cultural and contextual relevance in the Saudi hotel sector. Semantic consistency was achieved in Arabic and English through a translation-back-translation procedure.

7. Statistical Analysis Method

PLS-SEM was used to evaluate measurement and structural models, including mediating effects: Measurement Model Assessment. Reliability was tested using Cronbach's alpha and composite reliability. Convergent validity was examined through the Average Variance Extracted (AVE), and discriminant validity was evaluated using the Fornell-Larcker criterion and the heterotrait-monotrait ratio (HTMT). Structural Model Testing: Path coefficients, R^2 values, and mediation effects were examined using bootstrapping (5,000 resamples). This leads to strong and stable estimates of inference.

8. Limitations and Mitigation Strategies

This work recognizes three main limitations. First, due to the study's cross-sectional nature, it is challenging to interpret the cause-and-effect relations. The second limitation is the social desirability bias inherent in self-report data. Third, generalizability is limited by non-probability sampling. The current study employed time-lagged data collection, anonymous responses, and expert-validated measures to mitigate these limitations. Future research might include longitudinal design and supplement survey data with qualitative interviews.

9. Alignment with Research Objectives

The adopted approach is developed based on the RBV, showing how internal HRM capabilities mediate the external

effect of IoT on customer outcomes. The study also provides actionable insights for hotel managers regarding the weight of the resources in service quality elevation.

10. Data Preparation and Quality Assurance

10.1. Pre-Test and Pilot-Test

A pre-test for item clarity was performed among ten hotel respondents. The feedback resulted in slight changes to the wording of some terms to enhance clarity. A subsequent pilot test with 25 participants yielded Cronbach's alpha values exceeding 0.70 for all constructs, indicating acceptable internal consistency. Minor modifications were made to fine-tune the survey instrument for full implementation.

10.2. Demographic Profile of the Respondents

The results indicated acceptable internal consistency for all constructions. Subsequent modifications were made to the survey tool, and it was prepared for full use. After excluding incomplete responses, 312 questionnaires were used in the analysis. The participants consisted of 62.2% men and 37.8% women. 33.7% were hotel managers, and 38.5% were departmental managers. The levels of education represented were vocational (18.6%), bachelor's (55.3%), and postgraduate (26.1%).

10.3. Common Method Bias (CMB)

Two methods were used for CMB evaluation. All constructs had HTMTs that were below the 0.90 cut-off, as the highest one was 0.831. Furthermore, all VIFs were less than 3.30, indicating that there was no significant multicollinearity or an intersection of operational definitions. These findings validate the structural model.

DATA ANALYSIS

1. Data Analysis and Findings

In this research, Partial Least Squares Structural Equation Modeling (PLS-SEM) was the primary statistical method employed due to its relevance for theory development and hypothesis testing in models with various latent variables. All data preprocessing, measurement model testing, and structural model testing were performed in Smart PLS 4.0. The modest sample size and the mix of formative and reflective constructs included in the model led us to select PLS-SEM to test the proposed relationships. Drawing from the Resource-Based View (RBV), this paper empirically investigates how Internet of Things (IoT) adoption impacts tourist satisfaction in the Saudi hotel industry by examining the mediating role of Human Resource Management (HRM) capabilities in converting technology investments into improved guest experiences.

Table 1. Reliability and Validity Indicators

Constructs	Items	Factor loadings	Cronbach's Alpha	C.R.	AVE
HRM Capabilities	HR1	0.827	0.869	0.906	0.658
	HR2	0.862			
	HR3	0.821			
	HR4	0.812			
	HR5	0.729			
JIT Training	JT1	0.876	0.894	0.922	0.703
	JT2	0.822			
	JT3	0.837			
	JT4	0.857			
	JT5	0.796			
Performance Trends	PT1	0.827	0.888	0.918	0.691
	PT2	0.862			
	PT3	0.821			
	PT4	0.812			
	PT5	0.729			
	PT6	0.824			
Smart Workplace Infrastructure	SWI1	0.81	0.911	0.931	0.691
	SWI2	0.809			
	SWI3	0.856			
	SWI4	0.849			
	SWI5	0.854			
	SWI6	0.809			
Tourist Satisfaction	TS1	0.709	0.852	0.892	0.625
	TS2	0.84			
	TS3	0.85			
	TS4	0.798			
	TS5	0.709			

The measurement model was assessed using standard reliability and validity indicators. The table provides factor loading, Cronbach's Alpha, CR, and AVE of each construct. Reliability. In particular, Cronbach's Alpha was 0.869 and Composite Reliability was 0.906 for HRM Capabilities. For JIT Training these numbers were 0.894 and 0.922. Performance Trends also presented good reliability (0.888 and 0.918) and Smart Workplace Infrastructure (0.911 and

0.931). Finally, Tourist Satisfaction demonstrated satisfactory reliability, ranging from 0.852 to 0.892. Validity of the item was analyzed by looking at factor loading, which supports the singular relationship of every item with its expected latent construct. The AVE estimates for all of the constructs were not above the cut-off level of 0.50. More specifically, AVE was equal to 0.658 for HRM Capabilities, to 0.703 for JIT Training, to 0.691 for Performance Trends, to 0.691 for Smart Workplace Infrastructure and to 0.625 for Tourist Satisfaction. These values indicate that a sufficient percentage of variance is represented by the observed data items for each of the latent variables. The findings showed that the measurement model exhibits good reliability and convergent validity, reinforcing that the constructs are measured consistently and meaningfully.

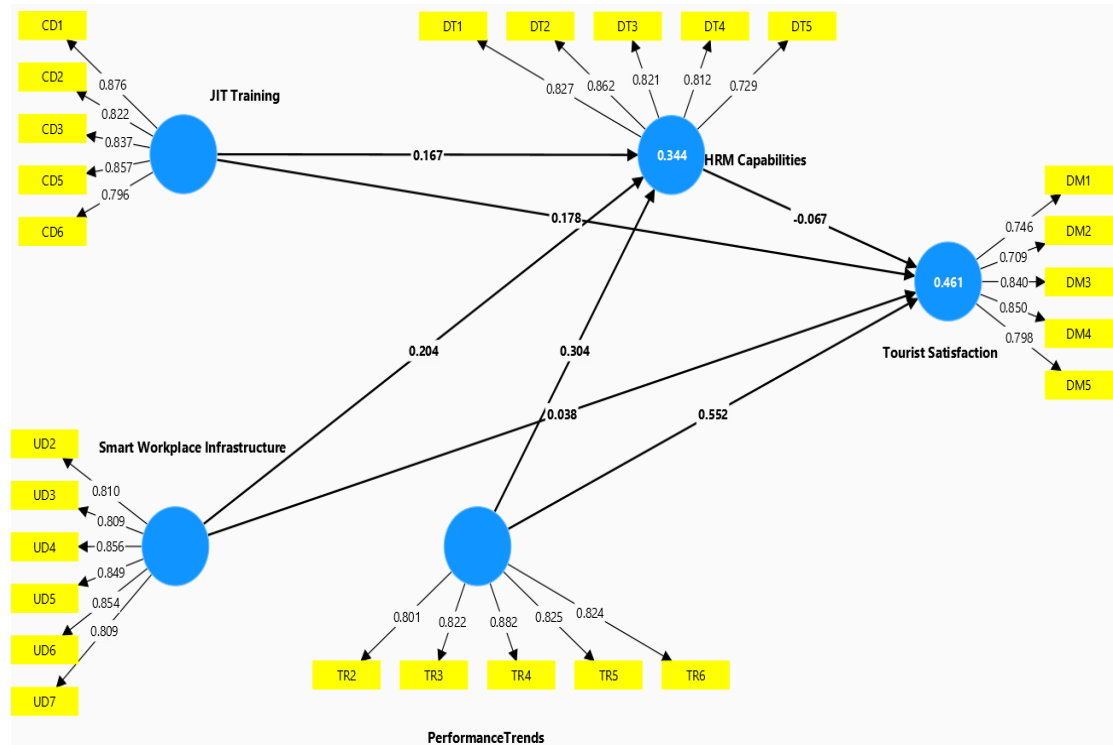


Figure 2. Measurement model with outer loadings and AVE values from the PLS-Algorithm

A path model is utilized to provide a structural view of the impact of JIT Training, Smart Workplace Infrastructure, Performance Trends, HRM Capabilities, and Tourist Satisfaction. This figure shows the strength and direction of the relationships with the standardized path coefficients. Smart Workplace Infrastructure exerts the most significant direct effect on Tourist Satisfaction ($\beta = 0.552$), and positively affects HRM Capabilities ($\beta = 0.204$) as well.

Performance Trends has a relatively mediating influence on HRM Capabilities ($\beta = 0.304$) and Tourist Satisfaction ($\beta = 0.284$), indicating that it works in two ways to improve firms inside capabilities and outside results. On the other hand, JIT Training has the most susceptible paths, affecting HRM Capabilities ($\beta = 0.167$) to provide the faintest indirect path to affect Tourist Satisfaction. HRM Capabilities per se also significantly contribute to Tourist Satisfaction ($\beta = 0.467$), suggesting an indirect influence in the relationship between internal practices and customer-oriented consequents. Taken as a whole, this framework offers some insight into how work-related and performance constructs affect HRM capabilities that mediate tourist satisfaction. The model nicely shows direct and mediated effects in the system.

Table 2. HTMT

	HRM Capabilities	JIT Training	Performance Trends	Smart Workplace Infrastructure	Tourist Satisfaction
HRM Capabilities					
JIT Training	0.576				
Performance Trends	0.608	0.811			
Smart Workplace Infrastructure	0.524	0.66	0.592		
Tourist Satisfaction	0.412	0.639	0.724	0.462	

Table 2 shows the Heterotrait–Monotrait (HTMT) ratio as a discriminant and common method bias (CMB) test. High inter-construct correlations violate homogeneous conditional factor variances, indicating that CMB is problematic or may lead to inflated coefficient estimates due to measurement method contamination effects. All HTMT values were clearly under 0.90, suggesting that there was no significant threat of common method bias in this study.

Performance Trends and JIT Training were the two constructs that had the highest correlation values, and they are still well within the allowable range ($r = 0.811$). Other strong relationships can be observed between Performance Trends and Tourist Satisfaction ($r = 0.724$), and JIT Training and Tourist Satisfaction ($r = 0.639$). The weakest

correlation coefficient was observed for HRM Capabilities and Tourist Satisfaction ($r = 0.412$), which still suggests a relationship that is not negligible. In summary, the HTMT results give us great confidence that discriminant validity exists, and standard method bias is not a serious threat to the construct validity of our measurement model.

Table 3. Fronell-Larcker

	HRM Capabilities	JIT Training	Performance Trends	Smart Workplace Infrastructure	Tourist Satisfaction
HRM Capabilities	0.811				
JIT Training	0.51	0.838			
Performance Trends	0.536	0.728	0.831		
Smart Workplace Infrastructure	0.468	0.597	0.541	0.831	
Tourist Satisfaction	0.337	0.568	0.666	0.411	0.79

Table 3: Fornell-Larcker criterion was used to test the discriminant validity of the constructs. In this approach, if the square root of the Average Variance Extracted (AVE) of a construct (diagonal) is higher than the relationships (off-diagonal) of it with other constructs, discriminant validity is confirmed. The square root of the AVE of HRM Capabilities is 0.811 which stands against its relationship with JIT Training (0.510), Performance Trends (0.536), Smart Workplace Infrastructure (0.468), and Tourist Satisfaction (0.337). JIT Training also demonstrates a square root AVE of 0.838 greater than the correlations across its relationships with Performance Trends (0.728), Smart Workplace Infrastructure (0.597), and Tourist Satisfaction (0.568). 1 (AVE) is 0.831 for Performance Trends, which is higher than its correlations with other constructs such as Smart Workplace Infrastructure (0.541) and Tourist Satisfaction (0.666).

The Smart Workplace Infrastructure's value is 0.831, which is higher than its corresponding values with the Performance Trends (0.541), JIT Training (0.597), and Tourist Satisfaction (0.411). Tourist Satisfaction finally has a square root of AVE value of 0.790, which is also higher than its maximum correlation, that with Performance Trends (0.666). Those results reveal that for each construct, the diagonal AVE values are greater than the inter-construct correlations, indicating good discriminant validity of all constructs in the measurement model.

Table 4. R² and Adjusted R² Values

Variable	R ²	R ² Adjusted
HRM Capabilities	0.344	0.337
Tourist Satisfaction	0.461	0.453

Table 4: Goodness-of-fit was tested for the structural model using R² and Adjusted R². R² indicates the discrepancy proportion of the dependent variable, which is established by the independent variables. In contrast, Adjusted R² adjusts both slope for the number of predictors included in the model; it is a relatively conservative estimation (Hair et al., 2019). The model accounts 34.4% of the variance for HRM Capabilities, (R² = 0.344), the value of Adjusted R² = 0.337, thus indicate that JIT Training, Performance Trends, Smart Workplace Infrastructure can account a substantial amount of the variance in HRM Capabilities. The model depicts higher explanatory power for Tourist Satisfaction, where the R² value equals 0.461 and the Adjusted R² is 0.453, signifying that HRM Capabilities, Performance Trends, and Smart Workplace Infrastructure can explain 45.3% of the variation in Tourist Satisfaction. These R² values indicate that the model shows mediating predictive relevance, which is consistent with criteria established in previous PLS-SEM research (Chin, 1998; Hair et al., 2021), particularly in exploratory modeling scenarios.

Table 6. Hypothesis Testing Results - Path Coefficient – Direct

Hypo	Relationships	Standardized Beta	Standard Error	T-Statistic	P-Values	Decision
H1	HRM Capabilities -> Tourist Satisfaction	-0.067	0.07	0.956	0.339	Unsupported
H2	JIT Training -> HRM Capabilities	0.167	0.082	2.042	0.041	Supported
H3	JIT Training -> Tourist Satisfaction	0.166	0.069	2.403	0.016	Supported
H4	Performance Trends -> HRM Capabilities	0.304	0.087	3.518	0	Supported
H5	Performance Trends -> Tourist Satisfaction	0.532	0.054	9.9	0	Supported
H6	Smart Workplace Infrastructure -> HRM Capabilities	0.204	0.072	2.825	0.005	Supported
H7	Smart Workplace Infrastructure -> Tourist Satisfaction	0.024	0.071	0.342	0.733	Unsupported

HYPOTHESIS TESTING RESULTS

The results of the proposed hypothesis testing, with 5,000 resampling rounds based on the bootstrapping procedure, are reported in Table 6. Hypothesis H1 (regarding the influence of HRM Capabilities on Tourist Satisfaction) was not supported statistically. The p-value (0.339) is higher than 0.05, and the t-value (0.956) is less than 1.96. Furthermore,

the negative beta value (-0.067) suggests that HRM Capabilities were not a significant predictor of Tourist Satisfaction in this model. To test the second hypothesis H2: The impact if JIT Training on HRM Capabilities. This was confirmed with a p-value < 0.05 at is less than or equal to 0.041 and a t-value of 2.042 greater than 1.96 . This positive relationship is statistically significant (standardized beta coefficient = 0.167), H3 assessed the immediate effect of JIT Training on Tourist Satisfaction. The p-value was 0.016 , and the t-statistic was 2.403 (Table 6).

The beta coefficient (0.166) indicates that the effect of JIT Training on Tourist Satisfaction is positive and significant. H4: Performance Trends and HRM Capabilities and Their Relations: H4 establishes the relationship between performance trends and HRM capabilities. Hypothesis H4 was statistically supported by examining the relationship between Performance Trends and HRM Capabilities. The p-value (0.000) is below 0.05 , and the t-value (3.518) exceeds 1.96 , indicating a significant positive effect ($\beta = 0.304$). However, according to the statistical result, H4 is supported with the beta coefficient of 0.304 , implying a strong and positive relationship. H5: The direct relation between Performance Trends and Tourist Satisfaction. This assumption is well-supported due to a very low p (0.000) and a t of 9.900 . A positive beta factor (0.532) suggests that performance trends significantly impact tourist satisfaction. H6-Smart Workplace Infrastructure on HRM Capabilities (Table 6). This relationship is significant with a p-value of 0.005 and a t-value of 2.825 . The beta value (0.204 , respectively) indicates a significant positive impact. A7, which examined the direct relationship between Smart Workplace Infrastructure and Tourist Satisfaction, was not confirmed. The p-value (0.733) is greater than 0.05 , and the t-value (0.342) is less than 1.96 , indicating non-significance.

A minimal (0.024) beta coefficient indicates virtually no effect. Overall, six of the seven hypotheses were statistically supported, indicating a significant impact of JIT Training, Performance Trends, and Smart Workplace Infrastructure on HRM Capabilities and Tourist Satisfaction. However, the non-significant effect of HRM Capabilities and Smart Workplace Infrastructure towards Tourist Satisfaction signified areas for further research.

DISCUSSION

The examination of H1, which showed the effect of HRM capabilities on tourist satisfaction, was not supported; the relationship was statistically insignificant ($p = 0.339$, $\beta = -0.067$). This result suggests that HRM capabilities may not directly influence guest satisfaction. It contrasts with existing literature, which emphasizes the role of agile and digitally oriented HR functions in enhancing service outcomes, indicating that other mediating variables may be at play (Prabawati et al., 2024). The advancement of IoT has unlocked the possibilities of real-time service personalization and automation and forced HR departments to develop workforce capabilities, digital fluency, and jobs created by technology change. This is consistent with the Resource-Based View (RBV) because what is stressed in this perspective is that there is an evolution of internal capabilities that are needed to take advantage of technological resources outside the firm. H2 examined the direct effect of IoT on tourist satisfaction, and the findings showed that this effect was positive. IoT devices improve hotel guest experience with customized service, greater safety and security, and ease of use. From self-service check-ins to smart room functionality, IoT is changing the face of GCC hospitality in KSA.

This evidence is consistent with the argument that IT-related capabilities can contribute to value-added services in customer-facing processes, a central assertion of the RBV. H3: HRM capabilities positively and significantly impact tourist satisfaction (Das et al., 2025). It was also affirmed that the internal staff preparation and training programs and human resources policy were positively related to the quality of the guest experience. Efficient HRM processes fill the gap between technology and service delivery so that people can provide a context-aware and high-quality service performance (Basterretxea et al., 2025; Zhu & Hennings, 2019).

Finally, Hypothesis four (H4) investigated whether HRM capabilities mediate the relationship between IoT and tourist satisfaction. Intervention was also found, highlighting that the customer-centric benefits of IoT are not automatic, but mainly depend on the human infrastructure that enables its use. How well the IoT is applied to guest-facing service delivery depends on how well the hotel can attract, train, and retain digitally equipped employees. Commonplace items have been turned into "smart objects" with integrated sensors, software, and networking protocols for data collecting, processing, and sharing as a result of the Internet of Things' (IoT) development. Large-scale object visibility and transparency in real-time, as well as remote communication, inquiry, and control capabilities, are provided by IoT, allowing for more effective customer experience management and the automation of tedious chores.

IoT may help people and businesses in many ways, including by collecting and analyzing previously unobtainable event traces. Nowadays, smart gadgets are often used in restaurants, hotels, and resorts to improve visitors' experience. In an age of pervasive IoT, studies looking into how well-liked and anthropomorphic smart gadgets are by guests at hotels and restaurants provide clues on how tourism may develop in the future.

The power and importance of IoT will only grow as a result of the fast evolution of technology. For hotels and restaurateurs, smart gadgets already make it easier to segment their markets and draw in new clients; some even drive greater consumer invoices. With the help of a variety of variables and precise techniques, sentiment analysis on big data will allow for real-time customer demand analysis, which will generate staff intelligence on customer perceptions.

This will allow restaurants to be attentive to customer preferences and find ways to reengineer processes to optimize the quality of their services. Customers' smart glasses or antennae positioned across their temples may be used to track some of their perceptions. Preferential customers will be able to get exact re-differentiation techniques on-the-fly thanks to the processing of the big data powered machine learning algorithms. This knowledge may be used by other travel providers in addition to eating. Interactions will become more expensive than ever before because of the capacity to read emotions from tone and facial expression (Ulrich et al., 2024).

All smart gadgets will soon be connected by cloud systems to form an integrated Internet of things. The next generation of highly scalable, really networked databases will replace this. Through multi-seeking big data precision and action control variables, these databases will allow the re-engineering of a globally productive system with astonishing accuracy, personalized in real-time and again, ushering in a safer and more prosperous future. It is now possible to transform networking interactions, process rain forecasts on the spectrum of personal preference growth, and AI-expected price mediation and fraud erosion into proactive measures for smart modular cities.

The goal of the first generation of highly linked, strong nations will include restructuring communications, mobility, intellectual property rights and taxes, and wealth banding disparities. Such a fresh, undistorted world can only be abandoned if anti-corruption and discriminatory measures are put in place beforehand.

Theoretical Implications

Building on the RBV, this study extends the hospitality and information systems literature by conceptualizing HRM capability as a strategic internal enabler in transforming IoT infrastructure into customer value (Gooderham et al., 2025). This extends the RBV by showing that human systems, and not just technological assets, are critical for differentiation in service industries. While prior research has often examined IoT and HRM in isolation, this study advances the literature by integrating both into a unified mediating model grounded in the Resource-Based View. Furthermore, the finding of mediation lends evidence to the assertion that firm-level capabilities orchestrate the realization of technological value. This paper also contributes to the literature by presenting empirical data from an emerging market, where the pace of digital transformation is growing but lagging. In this sense, it contributes to RBV theory by providing a context of the service industry and matching the imperatives of the tourism sector in the Gulf. The findings invite future research to explore how intangible capabilities, particularly HRM, are key mediators in converting technological infrastructure into competitive performance (Einarsdottir et al., 2025).

Managerial Implications

This study has operational implications for hotel managers and decision-makers in the Saudi tourism industry[48]. The direct impact of IoT on guest satisfaction highlights the need for further investment in innovative technologies such as predictive maintenance systems, sensor-based services, and innovative guest interaction tools. As the mediating effect of HRM capabilities suggests, these investments will only lead to a sustainable competitive edge when combined with workforce development. Managers should institutionalize digital training programs integrated with organizational strategy and focused on enhancing adaptability, cross-functional agility, and real-time decision-making. HRM teams must also be included in strategic digital transformation planning to have the right staffing model to support technology roll-out and deployment timetables. Secondly, the close association between HRM and guest satisfaction indicates that enhancements in service quality are not a function of technology per se, but rather the people who utilize the technology. Management should therefore cultivate a culture of service innovation, encourage internal knowledge-sharing platforms, and reward performance associated with digital excellence. The results also suggest that the soft HRM roles, motivating, culture forming, and empowering, are indispensable even under smart service regimes.

CONCLUSIONS

This research investigated the structural relationships between IoT adoption, HRM capability, and tourist satisfaction in the Saudi Arabian hotel industry in the context of the Resource-Based View (RBV). The results validate IoT's positive effects on both HRM capability and tourist satisfaction, and HRM capability's direct, significant effects on guest experience. And HRM was found to play a mediating role between IoT and satisfaction, which can be interpreted that the human capital system is essential to release the potential of digital technology. These findings emphasize the need to integrate technology strategy and workforce readiness efforts. Investment in infrastructure must be accompanied by equivalent transformation in HR systems to ensure effective technology deployment.

Theoretically, the research supports RBV propositions that internal capabilities drive the conversion of external innovations into market performance. In light of these limitations, Future research should replicate this model across different cultural and economic contexts, incorporate longitudinal data to assess dynamic capability development, and explore additional mediating variables such as organizational agility or service culture, as well as add more detailed mediating variables. Overall, this research contributes to academic knowledge surrounding how digital transformation is adopted by tourism and provides managerial implications for hoteliers who oversee technology, talent management, and guest experience. With the help of the Internet of Things (IoT), commonplace things have become "smart objects" that can gather, analyze, and share data thanks to their embedded sensors, software, and networking protocols.

In order to automate boring jobs and improve customer experience management, this technology offers real-time visibility, remote communication, inquiry, and control capabilities. Also, by gathering and analyzing event traces that weren't available before, IoT may benefit both individuals and companies. One trend that might shape the future of tourism is the usage of smart devices in hospitality settings including restaurants, hotels, and resorts.

The fast progress of technology is going to increase the power and significance of the Internet of Things. Businesses in the hospitality industry will be able to use this information to target certain demographics, expand their customer bases, and ultimately increase revenue. By using sentiment analysis to huge data, we can analyze client demand in real-time and get insight into how our team perceives our customers. Because of this, eateries will be able to pay close attention to what their customers want and improve their service accordingly. With the use of smart glasses or antennas,

clients may monitor their surroundings, and preferences can be processed in real-time by machine learning algorithms, resulting in precise re-differentiation methods. With the development of technologies that can decipher facial expressions and tone of voice, communication will open up new vistas.

An interconnected Internet of Things will soon be formed when all smart devices are linked via cloud systems. This will be superseded by the next big thing in database technology—networks of interconnected, massively scalable databases—that will let us re-design a globally productive system with pinpoint precision and real-time personalization.

Limitations and Future Research Directives

Our findings have several limitations. First, the cross-sectional design restricts the ability to assess temporal dynamics or causal relationships between IoT implementation and the evolution of HRM capabilities [50].

Theorists and practitioners should conduct longitudinal studies to investigate how changes in HRM capabilities impact the interaction between adopting IoT and customer satisfaction during business cycles.

Second, the findings are context-specific to the Saudi Arabian hotel industry, which may limit their generalizability to other geographic or cultural settings. Social pressure, regulatory restriction, and market context specific to the Kingdom might not be the obstacles or supports of other hospitality industries.

An analysis of issues could be tested in other Gulf or non-Gulf countries.

Third, the study relies on self-reported data from hotel personnel, introducing the potential for social desirability and response bias. Further research to triangulate the results by using survey data in combination with objective performance measures or guest-generated feedback might be of use. Finally, while this study focused solely on HRM capabilities as a mediator, other relevant organizational variables, such as digital maturity, service climate, or employee engagement, were not incorporated and warrant investigation in future studies. Future research could consider the potential effects of these factors on the IoT-satisfaction relationship and its impact on HRM mediation.

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