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HYBRID INTELLIGENCE (HI) IN THE HOSPITALITY INDUSTRY: EFFECTS ON TRUST, PERCEIVED SERVICE QUALITY AND CUSTOMER SATISFACTION

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Abstract

In an emerging country like Morocco, the hospitality sector is facing gradual transformations due to the integration of artificial intelligence technologies, such as check in kiosks, chatbots, and assistance robots. While this dynamic is still limited and heterogeneous, it aims to improve service efficiency and personalize the customer experience, while also raising questions about the acceptability of these systems and their effects on three main dimensions of customer experience: perceived service quality, trust, and customer satisfaction. Given the limitations of fully automated services, hybrid intelligence, defined as collaboration between AI and human intelligence, appears as an alternative option that combines the relational component with technological efficiency. This

study aims to examine the comparative impact of three types of hotel reception modalities; Human-only reception, AI-only reception, and reception based on hybrid intelligence on the three main dimensions of customer experience. To this end, we adopted a quantitative approach based on a comparative questionnaire administered to Moroccan hotel guests who have stayed at least once in a 4- or 5-star hotel in Marrakech. The results confirm that the hybrid model, where clients interact with AI and humans, generate higher levels of trust, perceived quality and satisfaction than either a purely human or purely AI based reception. The results also indicate that customers familiar with AI use demonstrate a higher degree of trust in AI-based systems. Furthermore, customers with a strong relationship orientation report being satisfied with the experience offered by hybrid or human-dominated models. This study enriches the understanding of the role of hybrid intelligence in hotel services within the Moroccan context and offers practical recommendations for hotels wishing to integrate AI technologies without compromising the customer experience. Due to the use of scenarios and a convenience sample, this study has limitations in terms of generalizing the results. However, it opens up avenues for future research based on real-world experimentation and the integration of in-depth qualitative approaches.

Keywords:
Hospitality, Hybrid Intelligence, Artificial Intelligence, Customer Experience, Trust, Perceived Service Quality, Customer Satisfaction

1. Introduction

Over the past two decades, the digital transformation of the hospitality industry has accelerated significantly, driven by the rise of artificial intelligence and smart service technologies. In a context of increased competition and widespread digitalization, hotels are being forced to rethink how they produce and deliver their services. They are increasingly integrating smart service technologies such as chatbots, virtual assistants, and service robots to enhance operational efficiency, satisfy increasingly demanding customers, and improve the overall customer experience. At this stage, AI is emerging as a key strategic lever for value creation in this sector.

Part of the global digital transformation movement of the hospitality sector, Morocco offers a relevant field of study. Tourism represents one of the structural pillars of the national economy, contributing around 7,3% to GPD, according to the ODJ. In 2024, the country welcomed 17.4 million visitors, confirming its position as the leading tourist destination in Africa and achieving, two years ahead of schedule, the objectives of the roadmap set for 2026 (Ministry of Tourism, Handicrafts and Social and Solidarity Economy). Tourism strong performance in 2024 underscores both the expansion and qualitative improvement of hotel services. This dynamic has been accompanied by increasing efforts to modernize infrastructure especially by integrating digital technologies in hotels. However, this technological transition remains heterogeneous, providing a favourable context for analyzing the effects of digital innovations, in particular artificial intelligence, on the customer experience in a sector where the relational dimension remains central.

While offering significant opportunities, the integration of AI into services raises important questions, especially in sectors where human interaction plays a significant role in the customer experience. Indeed, hospitality industry is, by its very nature, based on direct human interaction, characterized by proximity, emotion, and trust. In other words, excessive and uncontrolled automation of interactions can lead to a dehumanization of service and may generate consumer resistance (Belanche et al. (2021)), resulting in a degradation of the customer experience. These factors highlight the vulnerabilities of an approach exclusively focused on AI in contexts with a strong experiential dimension.

Given these challenges, hybrid intelligence (HI) is emerging as a promising alternative.

Hybrid intelligence refers to an approach where human capabilities are used in a complementary way with those of artificial intelligence, supporting a collaborative rather than a

substitution approach. This approach aims to leverage human strengths such as empathy, judgment, and creativity, as well as AI's strengths, particularly rapidity, precision and availability. In the hospitality sector, it allows for the preservation of the relational dimension of service while capitalizing on technological advancements.

Despite the growing interest in AI within the hospitality industry, existing literature has primarily focused on analyzing technologies considered in isolation, such as service robots and chatbots. In contrast, hybrid intelligence, still emerging and largely unexplored, appears to be a relevant framework for analyzing the customer experience in contemporary hotel services. Specifically, to examine the effects of hybrid intelligence on key service evaluation variables, namely trust, perceived quality, and customer satisfaction. Trust is a central determinant in the adoption and use of service technologies. In the hybrid context, the human presence can significantly contribute to building trust by mitigating the uncertainties associated with technology and reinforcing the customer's sense of security. Furthermore, perceived service quality is a central concept in marketing of service. Customer satisfaction is considered as an affective response resulting from the comparison between initial expectations and the actual experience.

In this context, a central question arises:

How does hybrid intelligence, by balancing technological efficiency and human emotion, influence customer evaluations of trust, perceived service quality, and satisfaction?

The objective of this study is to analyze the impact of hybrid intelligence in the hospitality sector on trust, perceived service quality, and customer satisfaction. This research has a dual ambition: to enrich the theoretical framework of the field and to provide practical insights for hospitality professionals.

From this perspective, this article will begin by presenting the theoretical framework used, then outline the conceptual model and research hypotheses, before describing the methodology adopted. The empirical results will then be assessed before formulating managerial implications aimed at supporting hotel establishments in the deployment of hybrid intelligence strategies.

2. Literature Review and Theoretical Framework

2.1. Artificial Intelligence (AI) in the Hospitality Industry

In a context of accelerated digital transformation and evolving customer expectations, artificial intelligence plays a major role in the hospitality sector. It has profoundly transformed the industry, reshaping how services are designed and delivered, as well as the nature of interactions between organizations and their customers.

John McCarthy, recognized as the first to officially introduce the term “Artificial Intelligence” at the Dartmouth Conference, defined it as “The discipline based on the assumption that every aspect of human intelligence can be explained, modeled, and accurately translated so that a machine can simulate it" (McCarthy, n.d.). This approach favours a rationalist and instrumental interpretation of intelligence, oriented towards achieving objectives.

In a more contemporary, service-oriented approach, AI refers to all technological devices capable of simulating some of human intelligence capabilities and used to perform service tasks and automate activities previously carried out by humans, thus establishing itself as a driver of innovation (Huang & Rust, 2018).

In the hospitality sector, these technologies primarily take the form of chatbots, service robots, virtual assistants, recommendation systems, and pricing mechanisms (Ivanov & Webster, 2019; Popesku, 2019). The use of AI is a lever for marketing, relational, and operational performance. Indeed, it enables the automation of repetitive and low value-added tasks, facilitates the streamlining of internal processes within hospitality establishments, provides predictive analytics, and allows for an in-depth analysis of customers’ preferences and behaviors, while ensuring continuous service availability and responsiveness. It contributes to the enhancement of service quality and satisfaction, thereby improving the overall customer experience.

All of these benefits give artificial intelligence a strategic role in a context characterized by intense competition and increasingly demanding service quality standards.

However, existing research is largely based on a techno-centric and functionalist approach, relying on the assumption of a direct relationship between service automation and performance. In this perspective, the automation is perceived as a key tool to reduce uncertainty, operational costs and human variability by standardizing processes and substituting human intervention by more efficient and reliable technical systems. In general, techno-centric vision consider humans as a weak link, which must be supervised and replaced by machines. This

assumption proves particularly problematic in relationally intensive services such as hospitality, where trust, perceived service quality, and satisfaction depend also on emotional and relational dimensions.

Several studies highlight the limitations of integrating artificial intelligence when it is used autonomously, leading to a dehumanization of the experience offered and diminishing human proximity. It can also generate negative reactions from customers, including mistrust and technological anxiety (Tussyadiah, 2020).

Beyond this, it raises ethical and privacy concerns, particularly regarding the collection, processing, and use of customers' personal data, which could weaken trust in hospitality establishments.

These elements reveal the vulnerabilities of a logic of total automation and call for a redefinition of the service model.

2.2. Hybrid Intelligence (HI) in Hospitality and Services: A Socio Technical Perspective

In light of the limitations highlighted in the literature regarding fully automated services, particularly in relationally intensive environments, hybrid intelligence appears as an emerging theoretical solution. These limitations cannot be reduced to technological constraints, but rather reflect a disconnect between an automation-driven approach and the social, emotional, and relational dimensions that shape the service experience in the hospitality sector.

In this context, socio technical theory enable to move beyond the opposition between automation and human interaction. It states that organisational performance is not based only on the level of technological sophistication, but rather on the integration of both social and technical dimensions. Performance is therefore not a result of technological integration, but the product of a balanced articulation between AI technologies and social interaction (relational dimension). In hospitality, hybrid intelligence can thus be considered as a socio-technical configuration in which human and artificial capabilities are jointly optimized to enhance both efficiency and relational quality.

Dellermann defines hybrid intelligence as "the ability to achieve complex objectives by combining human and artificial intelligence and obtain results superior to those that each could achieve individually, while continuously improving through mutual learning" (Dellermann et al., 2019). This definition emphasizes that collective performance exceeds the sum of individual performances, by thus moving beyond a strictly additive view of technology to promote a logic of

complementarity, where the creation of value emerges from the reciprocal interaction between humans and technology.

In the service sector, particularly in hospitality, this approach is based on a logic of role distribution, where AI handles analytical and repetitive tasks, while humans perform tasks requiring emotional intelligence, contextual adaptation, and strong interpersonal skills. However, this distribution of roles must be considered contingent and cannot be considered universal, as it is conditioned by organizational contexts, customer expectations and the degree of acceptance of technologies (Jarrahi, 2018).

To this end, it is important to clearly distinguish the different service configurations that can structure the customer experience in this industry. Human service is defined as a service configuration in which service delivery is fully handled by hotel staff. Conversely, automated service relies on the use of AI technologies such as chatbots, service robots, and interactive kiosks, primarily aimed at operational efficiency, standardization, and service continuity (Tussyadiah, 2020). Between these two modalities, hybrid service is based on the idea that the value of the service results from the complementarity between the analytical and operational capabilities of AI and the social and emotional skills of human actors (Jarrahi, 2018) (Raisch & Krakowski, 2021).

Table 1. *Difference between Human Service, Automated Service and Hybrid Service*

Dimensions	Human service	Automated service	Hybrid service
Primary service actor	Human employees	Artificial intelligence systems	Artificial intelligence systems + Human employees
Role of technology	Limited or supportive	Central and autonomous	Complementary to humans
Type of interaction	Human-to-human interaction	Human to machine interaction	Combined human–machine to human interaction
Main strengths	Empathy, personalization,	Speed, standardization, 24/7 availability	Complementarity, efficiency, relational quality

	emotional intelligence		
Main limitations	Variability, higher labor costs, limited availability	Perceived dehumanization, lack of empathy, trust issues	Organizational complexity, need for coordination

Source*: Authors' Own Elaboration*.

The hybrid service model manifests through the emergence of "hybrid hotels" (Puorto, 2025). These establishments are characterized by a balanced allocation of tasks between artificial intelligence and human employees. However, this balance is not uniform and can be classified into distinct levels within a hybrid intelligence typology. The most elementary level is the assisted hybrid intelligence, which characterizes contexts in which technology is used as a simple support for repetitive operational tasks. At an intermediate level, augmented hybrid intelligence promotes a co-decision model where artificial intelligence delivers analytical insighs that human interpret through ethical reasoning and emotional intelligence. At the highest level, symbiotic hybrid intelligence is characterized by a deep and reciprocal integration of human cognition and machine intelligence.

Within the theoretical continuity of research on hybrid hotels, the concept of "Humans-as-Luxury", introduced by Simone Puorto, emphasizes that human presence is becoming a scarce resource, constituting a competitive advantage and a highly differentiating factor in the hotel experience (Puorto, 2025), thus aligning with research highlighting the limitations of full automation and the value of human interaction. However, this concept cannot be generalized, as the perceived value of human presence depends largely on customer expectations, as well as the establishment's positioning and the context in which technology is used.

In this sense, recognizing the human element as a differentiating factor in the hospitality service is likely to have a significant impact on customer experience evaluation. In experiential marketing, customer experience evaluation can be viewed as a multidimensional process structured around three complementary dimensions (Lemon & Verhoef, 2016). First, it relies on a cognitive dimension, embodied by perceived service quality, which refers to a rational assessment

of the performance of the service provided. Second, it incorporates a relational dimension, represented by the trust placed in the service provider or technological systems. Finally, it unfolds through an emotional dimension, expressed by customer satisfaction, understood as an overall affective response to the experience.

2.3. Trust in Hybrid Intelligence Services

Trust is a fundamental construct in the analysis of artificial intelligence-based services, due to the limited transparency of these systems to customers and their high degree of operational autonomy. The information asymmetry generated by technological opacity exacerbates perceived uncertainty. Trust then come as a central regulatory principle, compensating for this uncertainty in the service evaluation process.

Conceptually, trust is defined as the belief that a system or service provider is reliable, competent, and user-oriented (McKnight et al., 2002).

In the hospitality industry, trust is a key determinant of customers' willingness to interact with technologies and disclose personal information. Existing literature highlights that trust has a positive effect on service acceptance (Gefen et al., 2003).

However, in services based on artificial intelligence, trust has a multidimensional nature and cannot be reduced to technology alone. It is built jointly with regard to the socio-technical system, the human actors, and the organization that ensures its legitimacy.

From this perspective, hybrid intelligence appears as a configuration likely to strengthen trust. The possibility of interacting with a human employee legitimizes the use of technology and contributes to mitigating uncertainty and reinforcing the feeling of security, thus leading to a positive customer evaluation of the service. However, the effectiveness of this mechanism depends closely on the quality of the human interaction and the customer's initial expectations. It can also be influenced by consumers' familiarity with AI technologies.

Therefore, trust is a key dimension of the customer experience that can be directly influenced by hybrid intelligence configurations.

2.4. Perceived Service Quality in a Hybrid Context

From a services marketing perspective, perceived service quality represents a conceptual pillar defined as the customer's overall evaluation and attitude regarding the excellence or superiority of the service received (Parasuraman et al., 1988).

In a hybrid intelligence context, it results from the combination of the human dimension, which offers empathy and reassurance, and the technological dimension, which contributes to

greater service efficiency and consistency. However, the simple coexistence of these two dimensions does not guarantee a positive evaluation of the service.

Perceived quality is based on customers' interpretation of the complementarity between human intervention and technology. When this is perceived as harmonious and in line with expectations, it strengthens the overall evaluation of the service. Conversely, any perceived mismatches, such as excessive automation or insufficient coordination between humans and technology, are likely to degrade perceived quality, regardless of the service's technical performance.

2.5. Customer Satisfaction in Hybrid Services

Customer satisfaction is one of the most studied concepts in marketing and marketing of services due to its central role in evaluating the consumption experience and explaining post-consumption behaviours.

It is defined as an overall assessment resulting from the gap between the consumer's initial expectations and the perceived performance of the product or service at the end of the consumption experience.

According to Oliver's model, satisfaction represents a post-experiential judgment that reflects the degree to which customer expectations are confirmed or disconfirmed (Oliver, 1980). Thus, satisfaction is considered a major determinant of post-consumption behaviour.

In the service sector, satisfaction occupies a central place due to the specific characteristics of services, notably their intangibility, heterogeneity, and interactional dimension. Research in services marketing emphasizes that customer satisfaction is multidimensional and is not limited to the technical performance of the service, but also embraces the quality of interactions, the service delivery process, and the service environment.

In this sense, Zeithaml, Bitner, and Gremler emphasize that satisfaction represents a comprehensive evaluation that integrates cognitive and affective components, resulting from all points of interaction between the customer and the service establishment, particularly the hotel staff and the technologies provided (Zeithaml et al., 2000).

In the hotel industry, customer satisfaction is a key indicator due to the experiential and relational nature of the offering. In this context, reception methods are determining factors likely to directly impact customer satisfaction, justifying its inclusion as a key variable in the conceptual model of this research.

3. Conceptual Model and Hypotheses

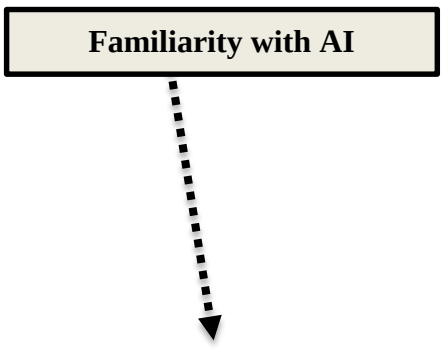
3.1. Conceptual Research Model

The proposed conceptual model adopts a simplified, parsimonious approach, aiming to assess the effect of service configurations on customer experience through direct causal links between variables. In this context, the service configuration is considered a major explanatory variable likely to directly influence several dimensions of customer experience, namely trust, perceived service quality, and customer satisfaction. These dimensions are conceived as distinct, without assuming the existence of intermediate mediating relationships. This allows for a rigorous analysis while avoiding excessive complexity that could compromise the model's readability and validity.

However, Customer reactions to service configurations are not homogeneous and may depend on individual characteristics. First, customers' familiarity with artificial intelligence technologies is a key factor influencing trust in technology-driven services. Customers who are more familiar with AI are better equipped to understand system functionalities, which can reduce uncertainty and risk. Second, relational orientation represents the value that customers attach to human interaction in such services. Which means that customers with high relational orientation may respond differently to AI-based reception modalities. Thus, the impact of service configurations on customer satisfaction may depend on the degree to which customers prioritize human contact.

This model relies on a comparative approach to study the impact of different hotel reception modalities on customer experience evaluation. Three service modalities are distinguished: human reception, reception entirely based on artificial intelligence, and hybrid reception combining AI technologies and human presence. These methods are operationalized using comparative scenarios, allowing for the comparison of respondents' assessments in terms of trust, perceived quality, and customer satisfaction.

The conceptual model representing the relationships between service configurations and dimensions of customer experience is presented in the figure below, including both direct relationships and moderating effects associated with customer related variables.



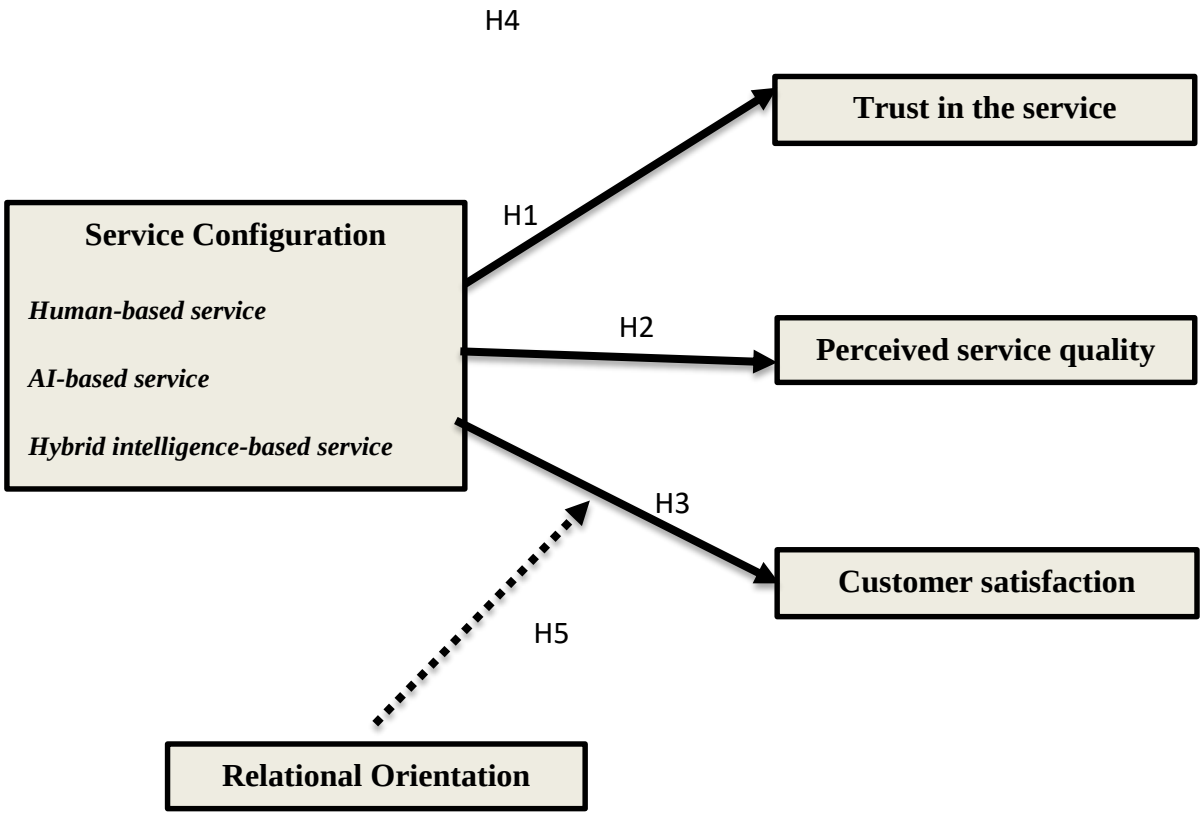


Figure 1. *Conceptual Model of the Impact of Hybrid Intelligence on the Customer Experience in the Hospitality Industry*

3.2. Research Hypotheses

Based on the proposed conceptual model, several explanatory hypotheses are formulated to empirically test the links between hotel reception service modalities, trust, perceived service quality, and customer satisfaction as well as the extent to which customer-related variables moderate trust and customer satisfaction.

H1: Hybrid intelligence-based service leads to higher customer trust compared to human-based and AI-based service.

H2: Hybrid intelligence-based service positively affects perceived service quality compared to human-based and AI-based service.

H3: Customer satisfaction is higher in hybrid intelligence-based service encounters than in human-only or AI-only service encounters.

H4: Customers' familiarity with AI moderates the relationship between hotel reception modality and trust in the service.

H5: Customers' relational orientation moderates the relationship between hotel reception modality and customer satisfaction.

4. Research Methodology

4.1. Research Design

This study adopts a quantitative approach, aiming to assess the impact of different hotel reception methods on the customer experience. A scenario-based design was chosen to comparatively evaluate the perceived effects of human-based reception, reception entirely based on artificial intelligence, and hybrid reception.

The questionnaire was developed in three versions, rigorously identical in structure and content, the only difference is the reception scenario presented in the introduction. Each version corresponds to one of the three modalities studied and was administered to separate samples of respondents.

This approach is relevant for examining emerging technologies, whose adoption remains limited or heterogeneous in certain contexts, particularly in Morocco.

4.2. Population and Sample

The target population for this study consists of Moroccan hotel guests who have stayed at least once in a 4* or 5* star hotel in Marrakech and who have interacted at least once with AI technologies.

The choice of the Moroccan context is justified by the limited and heterogeneous level of AI technology adoption within the hospitality industry. This situation offers a privileged field of analysis for examining customer attitudes toward hybrid intelligence systems in an environment where human-AI interactions are not yet standardized or institutionalized. It thus allows for the observation of variable development at an early stage of the technological diffusion process, limiting the trivialization biases associated with excessive familiarity with AI.

The study relied on an online questionnaire distributed to a convenience sample comprising 46 respondents for each scenario, which means a total of 138 respondents.

4.3. Data Collection

In accordance with the ethical requirements of academic research, respondents are informed of the anonymity and confidentiality of the data collected. Before the final distribution of the questionnaire, a pre-test is conducted with a limited number of participants to verify the clarity of the scenarios and the comprehensibility of the items.

4.4. Measurement Instruments

- **Perceived service quality**: the items to measure perceived service quality are adopted from the SERVQUAL scale developed by Parasuraman, Zeithaml and Berry (1988) as well as items developed by M.K Brady and J.J Cronin JR (2001).
- **Trust** measured by the scale developed by Sirdeshmukh, D., Singh, J., & Sabol, B. (2002) and also Doney et Cannon (1997) consisting of two dimensions: benevolence and credibility.
- **Customer satisfaction** measured by the scale developed by Oliver (1980) and Bitner et al. (1990).

All scale items were adopted to the hospitality service context.

5. Scale Validation

To ensure the internal consistency of the measurement instruments, both Cronbach's alpha and Composite Reliability (CR) were computed for each construct. Cronbach's alpha values above 0.70 indicate satisfactory reliability, while CR values above 0.70 confirm construct reliability (Hair et al., 2010). In addition, item-total correlations were examined to ensure that each item contributed positively to its construct.

Table 2. *Reliability and Validity Assessment of Measurement Constructs*

Construct	**Items**	**Cronbach's α**	**Composite Reliability (CR)**	**Average Variance Extracted (AVE)**
Trust	5	0.87	0.89	0.62
Perceived Service Quality	6	0.91	0.92	0.65
Customer Satisfaction	4	0.88	0.90	0.63

- All constructs exceeded the recommended reliability thresholds (α and CR > 0.70), indicating strong internal consistency. AVE values >0.50 confirm adequate convergent validity, showing that items effectively capture the intended construct.
- All standardized loadings were significant ($p < 0.001$) and above 0.70.

- Discriminant validity was confirmed using the Fornell–Larcker criterion.
- A confirmatory factor analysis (CFA) was conducted using AMOS. Model fit indices indicated good fit ($\chi^2/df = 1.92$; CFI = 0.96; TLI = 0.95; RMSEA = 0.056; SRMR = 0.048).

Multicollinearity and Correlations

Pearson correlation analysis was conducted to examine relationships among constructs and to assess potential multicollinearity.

Table 3. *Correlations and Multicollinearity among Constructs*

Construct	Trust	Perceived Service Quality	Customer Satisfaction
Trust	1	0.62**	0.59**
Perceived Service Quality	0.62**	1	0.65**
Customer Satisfaction	0.59**	0.65**	1

Correlations ranged from 0.59 to 0.65 ($p < 0.01$), indicating moderate and significant relationships among Trust, Perceived Service Quality, and Customer Satisfaction.

Variance Inflation Factor (VIF) values ranged from 1.45 to 1.68, confirming the absence of multicollinearity. These results indicate that the constructs are related but not redundant.

Normality and Homogeneity of Variances

Before conducting ANOVA, assumptions for parametric testing were verified. Skewness and kurtosis values ranged from -1.2 to 1.3, indicating approximate normality. Levene's test confirmed homogeneity of variances for all dependent variables ($p > 0.05$). These results confirm that one-way ANOVA was appropriate.

6. Results

To test the hypothesized relationships (H1–H5), a structural model analysis was conducted using ANOVA and post-hoc comparisons, as well as moderation analysis for customer-related variables.

- ***Effect of Service Modality on Trust (H1) :*** One-way ANOVA indicated significant differences among the three reception modalities: $F(2, 135) = 23.87$, $p < 0.001$. Tukey post-hoc analysis showed: Hybrid > AI ($p < 0.001$), Hybrid > Human ($p = 0.02$), Human > AI ($p = 0.03$).
  - H1 is supported.

- ***Effect of Service Modality on Perceived Service Quality (H2) :*** ANOVA results: $F(2, 135) = 29.14$, $p < 0.001$, $\eta^2 = 0.30$. Post-hoc tests showed: Hybrid > AI ($p < 0.001$), Hybrid > Human ($p = 0.01$), Human > AI ($p = 0.04$).
  - H2 is supported.
- ***Effect of Service Modality on Customer Satisfaction (H3) :*** ANOVA results: $F(2, 135) = 27.56$, $p < 0.001$, $\eta^2 = 0.29$. Post-hoc analysis showed: Hybrid > AI ($p < 0.001$), Hybrid > Human ($p = 0.02$), Human > AI ($p = 0.03$).
  - H3 is supported.
- ***Moderating Effects of Customer-Related Variables (H4) :*** AI Familiarity on Trust Two-way ANOVA revealed a significant interaction effect: $F(2, 132) = 4.12$, $p = 0.02$.
  - H4 is partially supported.
- R***elational Orientation on Customer Satisfaction (H5):*** Two-way ANOVA indicated a significant interaction effect: $F(2, 132) = 3.88$, $p = 0.03$.
  - H5 is partially supported.

Table 4. *Summary of Hypothesis Testing*

Hypothesis	**Supported?**	**Evidence**
H1: Hybrid → Trust	Yes	ANOVA + post-hoc
H2: Hybrid → Perceived Service Quality	Yes	ANOVA + post-hoc
H3: Hybrid → Satisfaction	Yes	ANOVA + post-hoc
H4: AI Familiarity moderates Trust	Yes, partially	Two-way ANOVA significant interaction
H5: Relational Orientation moderates Satisfaction	Yes, partially	Two-way ANOVA significant interaction

7. Discussion

The results show that hybrid reception modality outperforms both AI-based and human based modalities across trust, satisfaction, and perceived service quality. This reflects that the combination of human interaction and AI creates a synergistic effect that enhances the service experience.

From a theoretical perspective, these results go beyond techno-centric approaches that present AI as a tool that enhances performance. Indeed, even if AI-based reception offers speed and efficiency, it lacks the emotional and relational dimension necessary for building strong customer trust. Conversely, human-based service provides warmth and personalization, but does not guarantee speed and operational consistency. Therefore, hybrid intelligence establishes itself as an effective implementation of the socio-technical approach, combining technological capabilities with the relational dimension in hotel services.

Moderation analyses further refine the interpretation of these findings. The moderating role of AI familiarity indicates that trust in intelligent service configurations depends partly on customers' technological competence. Individuals with higher levels of AI familiarity exhibit greater trust in AI-integrated systems, suggesting that digital literacy reduces perceived uncertainty and enhances technology acceptance. Conversely, relational orientation significantly moderates the effect of reception modality on satisfaction. Customers with a strong relational orientation demonstrate a stronger preference for hybrid or human-based configurations, underlining the persistent importance of interpersonal interaction in hospitality settings. These findings confirm that customer responses to smart service configurations are not homogeneous, but contingent upon individual characteristics, reinforcing the need to account for user heterogeneity in the design of intelligent service systems.

Overall, hybrid intelligence emerges as a strategically balanced service configuration within hospitality. However, its effectiveness is contingent upon customer characteristics, particularly technological familiarity and relational orientation. These findings highlight the importance of incorporating heterogeneity into the design of intelligent service systems. In this perspective, managerial decisions regarding AI integration should move beyond uniform implementation toward more adaptive and segmented service configurations.

8. Managerial Implications

For hospitality managers and professionals in Morocco, technologies should be implemented gradually and should follow a customer-centric and socio-technical approach. AI must be adapted to Moroccan capabilities, resources, and local culture.

As hospitality and human interaction are highly valued, Moroccan managers are encouraged to consider artificial intelligence tools as a complement to employees, rather than a substitute. It follows that, a complementary approach based on hybrid intelligence is essential. Artificial intelligence can thus handle repetitive and routine tasks, optimize demand management, and support decision-making processes, while allowing employees to focus on interactions with high emotional and cultural value. This complementarity contributes to strengthening the perceived quality of service. Furthermore, these results highlight the central role of trust as a key dimension in evaluating hotel services. Ensuring a visible and accessible human presence alongside AI technologies is instrumental in alleviating customers' negative attitudes and perceptions.

However, even if managers offer a hybrid service, they must follow a strategy of segmenting their clientele according to their level of technological familiarity. This will allow them to offer personalized services depending on the type of client: technophile or those who value human interaction.

Importantly, it is essential to invest in staff training and the development of local digital skills to maximize the benefits of hybrid intelligence and ensure its sustainable adoption.

9. Conclusion

This study aimed to explore the impact of hybrid intelligence in the hospitality sector on three main dimensions of the customer experience: trust, perceived service quality, and customer satisfaction, by comparing three hotel reception models: traditional reception provided exclusively by humans, reception entirely based on artificial intelligence, and reception based on hybrid intelligence.

The results confirm the superior effectiveness of hybrid intelligence in hospitality services, demonstrating that the combination of AI efficiency and human relational skills enhances customer evaluations across Trust, Service Quality, and Satisfaction. Thus, when artificial intelligence is integrated in a complementary way to human intervention, it contributes positively to improving the customer experience in the hospitality industry without compromising the

relational aspect. Moreover, customer-related factors further refine these effects, highlighting the importance of considering individual differences in AI adoption and relational preferences.

From a theoretical point of view, this study contributes to the literature on hybrid intelligence, and artificial intelligence. It highlights the crucial role of hybrid intelligence in improving trust, perceived quality and customer satisfaction. Methodologically, this study employs a comparative experimental design that contrasting fully human, fully AI and hybrid service models, which facilitate the evaluation of their effects. Contextually, it presents a contextualized analysis of the Moroccan hospitality sector, which remains relatively unexplored in AI fields.

However, this study has several limitations. First, it relies on a scenario-based survey that may not accurately reflect actual customer behaviour in real-world service situations. Second, the use of a convenience sample focused on 4- and 5-star hotels in Marrakech raises concerns regarding external validity, limiting the generalizability of the findings to other hotel categories or geographical contexts. Finally, the contextual specificity of the study may also generates socio-economic, cultural, and hotel-standing biases, potentially affecting respondents' evaluations of hybrid intelligence and service quality.

Future research could prioritize real-world experimental methods or a qualitative approach to better understand customer attitudes. It should also adopt more representative samples, including different hotel categories, multiple destinations, and broader socio-economic and cultural contexts. Moreover, it could explore the mediating role of trust and perceived service quality in explaining the relationship between hybrid intelligence and customer satisfaction. Furthermore, incorporating moderating variables such as age and cultural differences would provide a more nuanced and refined analysis of the effects of hybrid intelligence.

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