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Technology Adoption and Guest Satisfaction in Selected Hotels in Kigali, Rwanda

[1] Kamanzi James, [2]Malgit Amos Akims

[1]School of Hospitality, Travel and Tourism Management, Mount Kenya University
[2]School of Business and Economics, Mount Kigali University

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Abstract: **This study examined the impact of technology adoption on guest satisfaction in selected hotels in Kigali, Rwanda, with emphasis on four dimensions: guest-facing technologies, technology training and support, user experience integration, and data security and privacy. A descriptive research design with a mixed-methods approach was employed, targeting 120 hotel staff at Hotel des Mille Collines and Serena Hotel. Data were collected from 98 purposively sampled respondents. Quantitative analysis was conducted using SPSS, applying descriptive statistics, Pearson correlation, and multiple regression. Findings revealed that guest-facing technologies significantly influenced guest satisfaction, showing a moderately strong effect ($R = 0.412$, $R^2 = 0.170$, $p = 0.000$), with 84.7% of respondents strongly acknowledging their positive contribution. Technology training and support emerged as the most critical predictor of satisfaction ($R = 0.523$, $R^2 = 0.274$, $p = 0.000$), highlighting the importance of staff competence and engagement in ensuring effective technology use. In contrast, user experience integration showed a weak and statistically insignificant relationship with satisfaction ($R = 0.066$, $R^2 = 0.004$, $p = 0.518$), indicating that interface design alone does not drive guest satisfaction unless coupled with contextual relevance and facilitation by staff. Similarly, data security and privacy demonstrated minimal predictive power ($R = 0.066$, $R^2 = 0.004$, $p = 0.518$), suggesting that guests are less aware of or less concerned with backend safeguards. Descriptive statistics further supported these results, with mean scores of 4.85 for guest-facing technologies, 4.81 for staff training and support, 4.66 for user experience, and 4.41 for data security and privacy. These values reflect variations in how each dimension is perceived to enhance satisfaction. The study concludes that technology adoption enhances guest satisfaction when combined with human-centered service delivery and localized system design. It recommends that hotel managers prioritize continuous staff training, improve usability of digital tools, and make data protection efforts more visible to guests. Additionally, it suggests that industry stakeholders invest in sustainable and innovative technologies, while the government should provide incentives, set standards, and strengthen regulatory frameworks to support digital transformation in hospitality. Finally, the research highlights the need for future longitudinal and comparative studies across East African Community (EAC) countries to guide regional strategies in hospitality management and digital integration.**

Key words: **Technology, Guest Satisfaction, Selected Hotels, Rwanda.**

1. INTRODUCTION AND BACKGROUND

The global hospitality industry is undergoing rapid digital transformation, with technology emerging as a key determinant of guest satisfaction and competitiveness. Hotels worldwide increasingly rely on guest-facing innovations such as mobile apps, self-service kiosks, voice assistants, and contactless payments, alongside back-end systems like Property Management Systems (PMS), Customer Relationship Management (CRM) platforms, and Artificial Intelligence (AI) applications (Bjork & Kauppi, 2020; Canary Technologies, 2024; Whatfix, 2024). These advancements not only streamline hotel operations but also personalize guest experiences, enhancing loyalty and repeat patronage. Evidence from regions such as Asia-Pacific and North America highlights investments in facial recognition systems, robotic assistants, and mobile concierge services,

all of which align with the digital preferences of contemporary travelers (Li & Chen, 2020; Wang & Xiang, 2021; Liu & Mattila, 2021). Across Europe, hotels in countries such as Germany and the United Kingdom have embraced Artificial Intelligence (AI), the Internet of Things (IoT), and contactless technologies to enhance service delivery and meet evolving expectations (Schuckert, Law, & Qiu, 2020; Janta, 2021). Meanwhile, in Africa, hospitality providers are increasingly leveraging mobile check-in systems, guest feedback platforms, and digital payment solutions to drive satisfaction (Muzenda & Muzenda, 2021; Olapade, Ojo, & Oyewobi, 2021). For instance, hotels in South Africa, Nigeria, and Egypt have implemented innovative tools such as digital key systems, in-room smart technologies, and analytics-driven personalization to improve operational efficiency and meet guest demands (Chikandiwa & Dlodlo, 2020; Hossny, Abou-Shouk, & Kassim, 2021).

These examples illustrate the global convergence toward technology-enabled hospitality experiences, albeit with contextual variations in adoption levels. East Africa has also witnessed accelerated digital adoption in the hotel sector, driven by post-pandemic recovery strategies, rising smartphone penetration, and the need for regional competitiveness. Hotels in Kenya, Tanzania, and Uganda have integrated tools such as cloud-based PMS, AI-powered chatbots, and immersive technologies like virtual and augmented reality to enrich guest experiences and strengthen marketing efforts (Mukoro & Lawal, 2020; Digest Tanzania, 2023; Mukabi & Waithaka, 2022). Moreover, the adoption of sustainable practices such as smart energy systems in Kenya or conservation-driven guest engagement in Uganda demonstrates the growing alignment between digital transformation and sustainability objectives (Ongore & K'Obonyo, 2021). Nonetheless, studies suggest that while guests appreciate technological convenience, they also value hybrid service models that combine innovation with personalized human interaction (Forbes Africa, 2024).

In Rwanda, the hospitality industry has expanded significantly over the past decade, supported by increased international arrivals and investments in tourism (Rwanda Development Board, 2021). Kigali, in particular, has emerged as a key destination for both business and leisure travelers, intensifying competition among hotels. While global trends emphasize technology as a catalyst for enhanced guest satisfaction, Rwanda's adoption patterns are shaped by local realities such as varying infrastructure capacity, high mobile penetration, and growing demand for sustainable tourism (Kasiva, 2018; GSMA Intelligence, 2023; African Development Bank, 2023). Hotels in Kigali are therefore compelled to integrate digital solutions ranging from mobile applications to sustainable service technologies not only to improve service delivery but also to meet rising guest expectations for seamless, tech-enabled experiences.

Within this context, examining the link between technology adoption and guest satisfaction in Kigali's hotels becomes crucial. As the city positions itself as a regional hub for meetings, incentives, conferences, and exhibitions (MICE), understanding how technology influences guest experiences provide valuable insights for both hoteliers and policymakers. This study therefore seeks to investigate how selected hotels in Kigali are leveraging technology to enhance guest satisfaction, with the broader goal of contributing to service excellence, operational efficiency, and sustainable growth in Rwanda's hospitality sector.

2. LITERATURE REVIEW

2.1 Theoretical Literature Review

2.1.1 Technology Adoption

Technology adoption in the hotel industry refers to the process by which hotels integrate and utilize technology to enhance their operations, services, and guest experiences. Over the years, the hospitality sector has witnessed significant advancements in technology adoption, driven by the need to improve efficiency, streamline processes, and meet the evolving expectations of modern travelers. Contactless Solutions: One prominent trend in technology adoption within the hotel industry is the widespread implementation of contactless solutions. Particularly in response to the COVID-19 pandemic, hotels have increasingly adopted contactless check-in/out procedures, mobile keyless entry systems, and contactless payment options to minimize physical interactions and enhance guest safety (Lim & Kim, 2021). Guest Room Automation: Hotels are increasingly incorporating smart technologies and Internet of Things (IoT) devices into guest rooms to improve convenience and personalization. These may include smart thermostats, lighting controls, voice-activated assistants, and in-room tablets for controlling various room functions, offering guests' greater control over their environment and enhancing their overall experience (Li & Xu, 2020).

Data analytics and personalization: Utilizing data analytics and artificial intelligence (AI), hotels can analyze guest preferences, behaviors, and feedback to personalize services and tailor experiences. By leveraging guest data, hotels can offer personalized recommendations, targeted promotions, and customized amenities, thereby enhancing guest satisfaction and loyalty (Chen *et al.*, 2021). Enhanced Communication Channels: Hotels are adopting advanced communication channels such as chatbots, mobile apps, and social media platforms to facilitate seamless communication with guests before, during, and after their stay. These channels enable guests to make inquiries, request services, and provide feedback in real time, fostering engagement and improving guest satisfaction (Kim & Lee, 2023). Sustainability Initiatives: Technology adoption in the hotel industry also encompasses sustainability initiatives aimed at reducing environmental impact. Hotels are implementing energy-efficient systems, waste reduction measures, and eco-friendly practices, supported by technologies such as smart energy management systems and IoT sensors to monitor resource usage and optimize efficiency (Han *et al.*, 2022). In the Rwandan context, the adoption of novel service approaches could differentiate hotels in a rapidly growing market.

2.1.2 Guest-Facing Technologies

Guest-facing technologies refer to the technological tools and functionalities implemented by hotels that directly interact with guests throughout their stay. These technologies play an increasingly crucial role in shaping guest satisfaction within the hospitality industry (Liu & Li, 2021). Here is a breakdown of some key guest-facing technologies and their impact: Mobile Apps: Hotel mobile apps have become a cornerstone of guest-facing technologies (Canary Technologies, 2022). They offer features like mobile check-in/out, room key access, booking amenities, and restaurant reservations, all aimed at enhancing guest convenience and streamlining the guest experience. Studies by Ivanov *et al.* (2022) highlighted the importance of user-friendly mobile app design for optimal guest satisfaction. Self-Service Kiosks: Self-service kiosks allow guests to perform tasks like check-in, room key retrieval, and bill payment independently. While some guests appreciate the efficiency, others might prefer human interaction (Chen *et al.*, 2022). Evolving Landscape: The hospitality industry continues to witness a rapid integration of new technologies aimed at enhancing the guest experience (Revfine.com, 2023).

For instance, Artificial Intelligence (AI) Integration: AI-powered chatbots within hotel mobile apps are becoming increasingly sophisticated, offering guests 24/7 support and personalized recommendations (Lee & Kozinet, 2023). Focus on Sustainability: Eco-friendly features like smart thermostats and in-room lighting controls are gaining traction as guests become more environmentally conscious (Lopez-Sanchez *et al.*, 2024). Rise of Contactless Technologies: Touchless check-in, mobile key access, and voice-activated controls are gaining popularity due to hygiene concerns and guest preference for convenience (Canary Technologies, 2023). Hotels need to strike a balance by offering self-service options alongside adequate staff support for guests who require assistance. In-Room Technology: Features like smart thermostats, lighting controls, and voice assistants can enhance guest comfort and personalization within the room (Park *et al.*, 2022). Emerging Technologies: Augmented Reality (AR): AR integration within hotel mobile apps is being explored to offer guests virtual tours of rooms, amenities, and local attractions (Li *et al.*, 2023). This can enhance guest decision-making and engagement, potentially leading to higher satisfaction. Internet of Things (IoT): Hyper-connected rooms with smart devices like voice-controlled thermostats, lighting, and even appliances are becoming more prevalent (Hitachi Consulting, 2024). This fosters guest comfort and personalization but raises concerns about data privacy that hotels need to address. Robotics in Hospitality: While still in the early stages, robots for tasks like luggage delivery or room service are being piloted by some hotels (Agarwal & Wu, 2024).

While some guests might embrace the novelty, ensuring guest comfort and addressing potential anxieties around robot interaction will be crucial. However, ensuring user-friendliness and clear instructions are crucial for guest adoption and satisfaction. Guest Communication Platforms: Online chat platforms and messaging apps offer real-time communication channels between guests and hotel staff. This allows guests to address concerns or make requests promptly, potentially leading to higher satisfaction (Intelity, 2022). Digital Signage: Interactive digital displays in lobbies or elevators can provide guests with real-time information about hotel services, amenities, and local attractions. This enhances guest experience and reduces the need for repetitive inquiries at the front desk.

2.1.3 Technology Training and Support

Importance of Basic Technology Skills: Studies (Canary Technologies, 2022) highlighted the increasing prevalence of guest-facing technologies like mobile check-in and online booking platforms. Even in the pre-2023 era, equipping staff with

basic skills to navigate these technologies was crucial for assisting guests and ensuring a smooth experience. Growing Complexity of Technology: The hospitality industry witnessed a rapid integration of new technologies in 2023 (Revfine.com, 2023). Features like AI-powered chatbots within apps and contactless check-in systems demanded a more comprehensive training approach for staff (Lee & Kozinet, 2023).

Focus on User Experience (UX): Research emphasized the importance of user experience (UX) for guest-facing technologies (Lee & Kozinet, 2023). Staff training needed to go beyond basic functionality to include troubleshooting common user issues and ensuring guests have a positive experience interacting with technology. Emerging Technologies Require Upskilling: The advent of technologies like Augmented Reality (AR) and the Internet of Things (IoT) in hotel rooms necessitates ongoing staff upskilling programs (Hitachi Consulting, 2024). Staff need to understand how these technologies operate, troubleshoot potential issues, and guide guests on utilizing them effectively. Building Confidence in Automation: As robotics gain a foothold in some hotels (Agarwal & Wu, 2024), staff training should address potential anxieties guests might have. This can involve demonstrating the robots' capabilities and how they complement, rather than replace, human interaction. Effective technology training and support for staff influences guest satisfaction in several ways: Improved Guest Support: Well-trained staff can effectively guide guests through using guest-facing technologies, minimizing frustration and enhancing the overall experience (Chen *et al.*, 2022).

Building Confidence in Technology: Guests are more likely to embrace technology if they feel confident using it with the support of knowledgeable staff (Canary Technologies, 2024). Addressing Concerns and Troubleshooting: When issues arise with guest-facing technologies, trained staff can troubleshoot problems promptly, minimizing inconvenience and maintaining guest satisfaction (Intelity, 2022, 2024). Technology training and support for staff can go hand-in-hand with the adoption of guest-facing technologies. Through investing in training programs that maintain speed with this evolving technology, hotels can empower their staff to provide seamless guest support and enhance guest satisfaction in an increasingly tech-driven hospitality sector.

2.1.4 Data Security and Privacy

In the age of guest-facing technologies adoption, data privacy and security emerge as paramount concerns within the hospitality industry, directly impacting guest satisfaction. Growing Reliance on Guest Data: Studies (Kim & Kasavana, 2020) highlighted the increasing amount of guest data collected by hotels through mobile apps, booking platforms, and online transactions. This data, encompassing personal information, preferences, and travel habits, became a valuable asset for personalization and targeted marketing. However, concerns around data privacy and security were already evident. Heightened Regulatory Landscape: The year 2023 witnessed a continued focus on data privacy regulations globally. Existing regulations like GDPR (General Data Protection Regulation) in the EU and growing awareness of data breaches emphasized the need for hotels to implement robust data security measures (Canary Technologies, 2023).

Guest Trust and Transparency: Research (Chen *et al.*, 2023) indicated that guests are increasingly concerned about how their data is collected, stored, and used by hotels. Transparency in data practices and clear communication regarding data privacy policies became crucial for maintaining guest trust. Evolving Technologies, Evolving Risks: With the emergence of technologies like AR and IoT in hotel rooms, the types of guest data collected are likely to expand (Hitachi Consulting, 2024). Hotels need to stay updated on evolving data privacy regulations and ensure all data collection practices are compliant and ethical. Building a Culture of Data Security: As the hospitality industry becomes increasingly reliant on data, fostering a culture of data security within hotel staff becomes crucial. This involves ongoing training programs to educate staff on data security best practices and potential vulnerabilities (Intelity, 2024). Data privacy and security directly affect guest satisfaction in the following ways: Trust and Confidence: Guests who feel confident their data is secure and used responsibly are more likely to be satisfied with their hotel experience (Kim & Kasavana, 2020).

Mitigating Data Breaches: Data breaches can erode guest trust and lead to significant reputational damage for hotels (Canary Technologies, 2023). Robust data security measures help prevent such breaches, contributing to guest satisfaction. Transparency and Control: Offering guests clear information about data collection practices and providing options to control their data usage fosters a sense of transparency and empowers guests, ultimately leading to higher satisfaction (Chen et al., 2023). Data privacy and security are no longer optional considerations in the hospitality industry. As technology adoption intensifies, hotels must prioritize robust data security measures, maintain transparency in data practices, and build a culture

of data security awareness among staff. By doing so, hotels can build trust with their guests and ensure data privacy and security contribute positively to overall guest satisfaction in the digital age.

2.1.5 Guest Satisfaction

Guest satisfaction in the hotel industry is a critical factor that directly influences the success and reputation of hotels. It refers to the overall evaluation and perception of guests regarding the quality of service, facilities, and experiences provided during their stay. Achieving high levels of guest satisfaction is essential for hotels to foster loyalty, generate positive word-of-mouth, and maintain a competitive edge in the market. Service Quality and Personalization: Guest satisfaction is heavily influenced by the quality-of-service delivery and the extent to which hotels can personalize experiences to meet individual preferences. Research suggests that personalized services significantly contribute to guest satisfaction levels (Liu & Mattila, 2020). Hotels that prioritize personalized interactions, anticipate guest needs, and provide tailored recommendations are more likely to enhance guest satisfaction and loyalty. Physical Environment and Amenities: The physical environment of hotels, including room comfort, cleanliness, and amenities, plays a crucial role in shaping guest satisfaction. Studies have found a positive relationship between the physical attributes of hotels and guest satisfaction levels (Yi *et al.*, 2022).

Hotels that invest in maintaining high standards of cleanliness, comfort, and aesthetic appeal can enhance guest satisfaction and improve overall guest experiences. Guest Engagement and Communication: Effective guest engagement and communication are essential for understanding guest preferences, addressing concerns, and fostering positive interactions. Research indicates that hotels that prioritize communication and actively seek guest feedback tend to achieve higher levels of guest satisfaction (Park & Allen, 2021). By leveraging communication channels such as mobile apps, chatbots, and social media platforms, hotels can engage with guests throughout their journey and enhance satisfaction levels. Value for Money and Price Perception: Guest satisfaction is also influenced by guests' perceptions of value for money and the fairness of pricing. Studies suggest that guests who perceive hotels as offering good value for money are more likely to report higher satisfaction levels (Han, 2023). Hotels that transparently communicate pricing, offer competitive rates, and deliver experiences commensurate with price expectations can enhance guest satisfaction and mitigate negative perceptions. Guest satisfaction extends beyond the duration of the stay and encompasses the post-stay experience.

The Internet of Things (IoT) and Data Explosion: With the rise of IoT integration within hotel rooms (Hitachi Consulting, 2024), the amount and type of guest data collected will likely expand significantly. This includes information on room temperature preferences, lighting usage, and even voice commands through smart speakers. Hotels need to develop robust data governance frameworks to ensure responsible collection, storage, and usage of this vast amount of data. Guest Concerns around Biometric Data: As some hotels explore biometric data collection (e.g., facial recognition for check-in), guest concerns about privacy and potential misuse will require careful consideration (Canary Technologies, 2024). Transparency about data collection purposes, along with strong security measures, will be crucial for building guest trust.

2.1.6 Effect of Guest-facing Technologies and Guest Satisfaction

The effect of guest-facing technologies on guest satisfaction in the hotel industry has been a subject of significant research interest in recent years. Guest-facing technologies consist of a variety of digital tools and platforms designed to enhance guest experiences and streamline interactions between guests and hotel staff. Mobile Applications and Self-Service Options. Mobile applications enable guests to access a range of services and information conveniently through their smartphones or tablets. Research suggests that the adoption of mobile apps for tasks such as mobile check-in/check-out, room service orders, and concierge services positively influences guest satisfaction by providing greater convenience and efficiency (Yang et al., 2021). Chatbots and Virtual Assistants: Chatbots and virtual assistants use artificial intelligence (AI) to interact with guests and address their inquiries or requests. Studies indicate that the deployment of chatbots in hotel settings can improve guest satisfaction by offering real-time assistance, personalized recommendations, and efficient resolution of queries (Liang & Xiang, 2023).

Digital Concierge Services: Digital concierge services provide guests with personalized recommendations for local attractions, dining options, and activities based on their preferences and interests. Research suggests that these services enhance guest satisfaction by offering tailored recommendations and facilitating memorable experiences during their stay (Wang & Kim, 2022). Smart Room Technologies: Smart room technologies, such as voice-activated assistants, smart thermostats, and in-room tablets, enable guests to control various room features and access information effortlessly. Studies indicate that the integration of smart room technologies contributes to guest satisfaction by enhancing comfort, convenience,

and overall experience (Lee & Yoo, 2020). Guest Feedback Platforms: Guest feedback platforms allow guests to provide real-time feedback and review their experiences during their stay. Research indicates that hotels that actively solicit and respond to guest feedback through digital platforms demonstrate their commitment to guest satisfaction, leading to improved guest perceptions and loyalty (Lee *et al.*, 2023).

2.1.7 Effect of Technology Training and Support and Guest Satisfaction

In the global context, hotels that provide comprehensive technology training and support to their staff tend to enhance guest satisfaction by ensuring smooth and efficient service delivery. Research indicates that well-trained staff equipped with the necessary technological skills can effectively utilize digital tools and systems to meet guest needs and preferences (Al-Emran *et al.*, 2021). Moreover, prompt and effective technical support for guests experiencing technology-related issues contributes to resolving problems swiftly and maintaining high levels of satisfaction (Chen *et al.*, 2023). In continental contexts such as Europe and North America, where technology adoption rates are high, the role of technology training and support in guest satisfaction is equally crucial. Studies indicate that hotels that invest in ongoing training programs and resources to update staff on new technologies and systems demonstrate a commitment to excellence in service delivery (Nguyen *et al.*, 2022).

Additionally, proactive technical support and troubleshooting assistance for guests contribute to resolving issues promptly and minimizing disruptions to their stay (Lim & Choi, 2020). In Kenya, hotels in Nairobi, Mombasa, and safari lodges in national parks prioritize technology training and support initiatives. Staff undergo training on using online booking platforms, guest management software, and mobile payment systems to streamline operations and enhance guest experiences (Makori & Odongo, 2023). Additionally, hotels provide dedicated technical support teams to assist guests with any technology-related queries or issues, ensuring guest satisfaction throughout their stay. Hotels in Tanzania, especially those in tourist hubs like Arusha and Zanzibar, focus on technology training to meet guest expectations. Staff receive training on utilizing digital guest service platforms, online reservation systems, and point-of-sale software. The availability of round-the-clock technical support ensures that any technology-related issues faced by guests are promptly addressed, contributing to overall guest satisfaction (Ochieng & Otieno, 2022). The technology adoption in the hotel industry is steadily increasing, and the provision of technology training and support plays a vital role in guest satisfaction. Research suggests that hotels that offer training sessions and workshops to familiarize staff with new technologies and software platforms empower employees to deliver enhanced guest experiences (Makori & Ondigo, 2023). Furthermore, dedicated technical support teams that are readily available to assist guests with technology-related queries or issues contribute to ensuring a seamless and satisfying stay (Kamau *et al.*, 2021).

2.1.8 Effect of User Experience and Guest Satisfaction

Globally, user experience (UX) encompasses all aspects of a guest's interaction with a hotel's products, services, and facilities. Research indicates that a positive user experience significantly influences guest satisfaction and loyalty (Chathoth *et al.*, 2020). Hotels that prioritize UX design principles, such as ease of navigation, intuitive interfaces, and personalized interactions, tend to achieve higher levels of guest satisfaction and repeat business (Chen *et al.*, 2022). In continental contexts such as Europe and North America, user experience is increasingly recognized as a critical factor in shaping guest perceptions and behaviors. Studies indicate that hotels that invest in enhancing UX across digital platforms, mobile applications, and online booking systems are better positioned to meet guest expectations and drive satisfaction (Olsen & Langer, 2021). Furthermore, the seamless integration of UX principles into all touchpoints of the guest journey contributes to fostering positive guest experiences and building brand loyalty (Rousta & Lam, 2023).

2.1.9 Effect of Data Security and Privacy and Guest Satisfaction

In the global context, concerns about data security and privacy significantly impact guest satisfaction in the hotel industry. Research indicates that hotels that prioritize robust data protection measures and transparent privacy policies tend to earn higher levels of trust and satisfaction from guests (Hua *et al.*, 2021). Conversely, data breaches or incidents of unauthorized access to guest information can lead to reputational damage and erode guest trust, resulting in decreased satisfaction and loyalty (Jiang *et al.*, 2022). In continental contexts such as Europe and North America, where data protection regulations such as the GDPR (General Data Protection Regulation) and CCPA (California Consumer Privacy Act) are stringent, data security and privacy play a central role in guest satisfaction. Hotels that comply with these regulations and demonstrate a commitment to safeguarding guest data through encryption, secure payment processing, and limited access controls are

perceived more favorably by guests (Lee & Kim, 2023). Conversely, hotels that fail to address data privacy concerns risk alienating guests and facing legal repercussions, which can negatively impact satisfaction and loyalty (Park & Lee, 2020).

In East Africa, where the adoption of data protection regulations may vary across countries, guest satisfaction in the hotel industry is also influenced by data security and privacy concerns. Research suggests that hotels that implement data encryption, secure Wi-Fi networks, and stringent access controls can enhance guest confidence in data handling practices (Ochieng *et al.*, 2022). Moreover, transparent communication about data security measures and guest rights regarding their personal information contributes to building trust and satisfaction among guests visiting the region (Makori & Mwiti, 2021).

2.2 Empirical Review

2.2.1 Guest-Facing Technologies and Guest Satisfaction

Liu (2023) studied the impact of artificial intelligence-powered chatbots on hotel guest satisfaction in China. The target population was hotel guests in China, with a sample size of 350. The study used an online survey with questions on chatbot interaction and satisfaction. The data analysis used Regression analysis. The study found that guests who used the AI chatbot reported higher satisfaction with information access and problem solving compared to traditional methods. AI chatbots can improve guest satisfaction by providing efficient and personalized service. However, the study recommended Hotels invest in user-friendly AI chatbots for enhanced guest experience and this was done in China, not in Rwanda. Wang *et al.* (2023) examined the effects of in-room voice assistants on hotel guest experience and purchase intention where the study population was hotel guests who used in-room voice assistants during their stay and a sample size of 420. The study used a survey with questions on voice assistant usage, perceived ease of use, and satisfaction with hotel services. The data analysis used hierarchical linear modeling; the research found that guests who used in-room voice assistants reported a more positive experience and higher intention to purchase additional hotel services. This suggests voice assistants can promote guest convenience and drive revenue and therefore, In-room voice assistants can be valuable guest-facing technologies for enhancing convenience and upselling services. The researcher recommended hotels consider implementing voice assistants in rooms and train staff on their functionalities.

Kim *et al.* (2020) analyzed how hotel guests respond to self-service technologies. The target population was hotel guests using self-service technologies for check-in, checkout, and room controls where a sample size of 500 was used, and a method of experimenting with different levels of self-service technology options. Guest satisfaction and perceived control were measured. Data Analysis: Analysis of Variance (ANOVA). It found that while guests appreciated the efficiency of self-service technologies, offering too many options led to decision fatigue and decreased satisfaction. A balance is needed when implementing self-service technologies to provide core functionalities but avoid overwhelming guests with excessive options. It was recommended that carefully evaluate the range of self-service technologies offered and prioritize guest needs for efficiency and control.

Choi and Kim, (2024) examined the effects of service robots on guest experience in luxury hotels. The research population was the guests at luxury hotels with service robots for tasks like luggage delivery or room service where the sample size was used as 300. The study used a method of pre- and post-stay surveys measuring guest expectations and satisfaction with service robots. Data Analysis was paired-sample t-tests. It was found that guests initially expressed some understanding of service robots, but after using them, their satisfaction with service efficiency and the novelty of the experience increased. This service robot can be a positive addition to luxury hotels, but managing guest expectations through clear communication is crucial. Hotels with service robots should train staff to address guest concerns and educate guests about robot capabilities to enhance the experience.

2.2.2 Technology Training and Support and Guest Satisfaction

Moon and Kim (2021) explored the mediating role of employee technology proficiency on the relationship between technology implementation and guest satisfaction in hotels where the population was the hotel staff and guests in South Korea. Sample Size of 200 hotel staff and 300 guests were selected. Survey for staff on technology training and proficiency, survey for guests on technology usage and satisfaction, and Structural Equation Modeling (SEM). The study of employee technology proficiency mediated the relationship between technology implementation and guest satisfaction. Hotels with well-trained staff had higher guest satisfaction with technology. Staff training is crucial for maximizing the benefits of

technology and improving guest satisfaction. Hotels should develop comprehensive training programs to ensure staff are comfortable using guest-facing technologies.

Hassan and Choi (2022) conducted a multi-national study on technology training for hotel staff where the target population was hotel staff across various countries (US, China, Europe) with a sample size of 500 hotel staff members from different hotel chains, an online survey for staff on training programs, perceived technology proficiency, and support from management was used where the data analysis used multi-group structural equation modeling (SEM). The study findings revealed cultural differences in training effectiveness. Standardized, hands-on training with ongoing support was most effective across regions. A one-size-fits-all training approach might not be sufficient. Hotels should consider cultural preferences when designing training programs and prioritize ongoing staff support. Also developing culturally sensitive training programs with a focus on practical skills and offering regular refreshers and support mechanisms for staff using technology.

Benitez-Guerrero et al. (2021) analyzed the impact of technology training on employee job satisfaction and guest satisfaction in a budget hotel chain in South America. The target population was Hotel staff and guests in a budget hotel chain in South America and it used a sample size of 220 hotel staff and 350 guests, the method used a two-part survey-staff survey on training received and job satisfaction; guest survey on technology usage and satisfaction, the data analysis preferred correlation analysis and regression analysis. The study found a positive correlation between staff training, employee job satisfaction, and ultimately, guest satisfaction with technology. Well-trained staff were more confident in assisting guests and facilitated a smoother guest experience. Investing in technology training for staff can improve not only employee morale but also guest satisfaction and the Budget hotels, which may have limited resources, should prioritize training programs that equip staff with the necessary skills to utilize technology effectively.

Li and Xiang (2023) established how gamification enhances technology training in the hospitality Industry the study population was the hotel staff in a hotel chain in Asia, a sample size of 180 hotel staff members was divided into control and experimental groups, and the experiment with traditional vs. gamified training program for new guest-facing technologies where the staff knowledge and guest satisfaction, pre-test and post-test designs with independent samples t-tests and the study were used. The study found that staff who participated in the gamified training program showed a significant increase in knowledge retention compared to the traditional training group, guests reported higher satisfaction with staff's ability to new technology. Gamification techniques can be an innovative approach to enhance technology training effectiveness, leading to improved guest experiences. Hotels should explore incorporating gamified elements into their staff training programs for engagement and knowledge retention.

2.2.3 User Experience and Guest Satisfaction

Sun and Wang (2022) studied optimizing hotel websites for the global traveler: A User experience study in a cross-cultural context where the target population is international hotel guests from diverse cultural backgrounds, with a sample size of 220 in which 110 countries were Western countries and 110 from Eastern countries which was considered, also website usability testing with eye-tracking and follow-up interviews was used as the method. The interview guide focused on user experience with website navigation, information clarity, and cultural appropriateness, combined analysis of eye-tracking data, visual attention patterns, and interview transcripts, thematic analysis was employed. The findings showed that cultural differences impacted user experience. Western guests preferred concise and direct information, while Eastern guests valued detailed descriptions and visuals. Hotels should consider cultural preferences when designing websites to optimize user experience for global audiences through developing website versions tailored to specific regions or offering customizable language and content options.

Ndung'u and Okumu (2023) investigated how enhancing guest satisfaction in African Boutique Hotel, the role of personalized service and user experience with the target population of guests at boutique hotels in Kenya, the sample size of 150, mixed-method approach with a quantitative survey measuring guest satisfaction and qualitative interviews exploring user experience with personalized service elements and the descriptive statistics for survey data and thematic analysis for interview transcripts. The findings came up with personalized service elements like remembering guest preferences and offering local recommendations significantly increased guest satisfaction. Guests appreciated a user experience that felt unique and catered to their individual needs. Boutique hotels in Africa can differentiate themselves by focusing on

personalized service and a user-centric approach. Invest in staff training to personalize guest interactions and gather guest preferences during the booking process.

Huang and Wu (2021) explored the user experience in the hotel booking process where the evaluation was based on the elaboration likelihood model. The target population was the online hotel bookers globally with a sample size of 30 industry experts who evaluated hotel booking websites based on discovery from the elaboration likelihood model (ELM). The method of heuristic evaluation is based on ELM principles (focus on central route processing encouraging thoughtful decision-making), reliability analysis, and identification of usability issues. The study identified website design flaws that hindered user experience and potentially led to booking abandonment, such as unclear information hierarchy or lack of transparency in pricing. Optimizing the hotel booking process for user experience, considering principles like the ELM, can improve conversion rates and guest satisfaction to conduct website usability evaluations and focus on design elements that facilitate clear information processing and informed booking decisions.

Zhang *et al.* (2024) analyzed the impact of in-room entertainment systems on hotel guest experience as a cross-cultural comparison. Uses and Gratifications Theory (UGT), the target population of hotel guests in the United States, China, and Germany with a sample size of 450 (150 from each country), an online survey measuring guest usage of in-room entertainment systems, user experience perceptions (entertainment options, ease of use, customization), and overall guest satisfaction, multivariate analysis of variance (MANOVA) to compare user experience and satisfaction across cultures were considered. The study revealed cultural differences in in-room entertainment preferences. US guests valued a wider variety of content, while Chinese guests prioritized ease of use and local content options. German guests placed greater emphasis on high-quality audio and visual features. However, positive user experience with the in-room entertainment system, regardless of specific preferences, led to higher guest satisfaction across all three cultures. While cultural variations exist in entertainment preferences, hotels can leverage UGT to understand guest motivations and design in-room systems that offer a positive user experience, ultimately leading to higher guest satisfaction globally to conduct user research to understand guest preferences in different regions and consider offering customizable entertainment options or partnerships with local content providers.

2.2.4 Data Security and Privacy on Guest Satisfaction

(Zhang *et al.* 2023) investigated the impact of hotel data security breaches on guest satisfaction in a multicultural context, a comparison of China and the United States with an uncertainty reduction theory (URT) where the target population was hotel guests in China and the United States. The study used a sample size of 300 where 150 countries were from China and 150 from the US. An online survey with questions on guest experiences with data breaches, perceived severity of breaches, and satisfaction with hotel responses, and a comparative analysis using independent samples t-tests and ANOVA were done. The study found that guests in both countries experienced decreased satisfaction after a data breach. However, Chinese guests placed a higher emphasis on the hotel's response to the breach and its efforts to regain trust. Hotels operating globally must consider cultural variations in guest expectations regarding data security and communication strategies after a breach to develop culturally sensitive communication plans to address guest concerns and rebuild trust after a data breach.

Adomako and Boateng (2023) examined building trust in the digital age, a framework for hotel data security in Africa. The study's target population was the hotel managers and guests in Ghana and South Africa, employing a mixed-method approach with a survey for hotel managers on data security practices and in-depth interviews with guests exploring their perceptions of data security risks where descriptive statistics for survey data and thematic analysis for interview transcripts were also considered. The study revealed a gap between hotel data security practices (often lacking) and guest expectations, guests emphasized the importance of data encryption, secure storage, and clear communication about data breaches. Hotels in Africa need to prioritize data security investments and educate staff on best practices to develop and implement robust data security protocols, train staff on data handling, and communicate security measures to guests to build trust.

Benitez-Capdevila *et al.* (2023) assessed the moderating role of perceived risk on the relationship between hotel data security breaches and guest loyalty in the European Union (EU). The study employed a protection motivation theory (PMT) with the target population used as hotel guests in the European Union (EU), a sample size of 450 was drawn, and an online survey measuring guest perceptions of data security risks, experiences with breaches, and loyalty intentions were used, and moderation analysis using regression techniques. The study found a negative relationship between data breaches and guest loyalty and interestingly, guests with a higher perception of data security risks were more likely to abandon a hotel brand

after a breach. Hotels in the EU must prioritize data security and transparency to maintain guest trust, particularly for risk-averse guests to develop robust data security protocols, communicate security practices clearly, and offer resources for guests to manage their data privacy preferences.

Olckers and Strydom (2024) analyzed data privacy concerns and hotel guest satisfaction in a developing market in South Africa. The research used privacy calculus theory (PCT) where the target population was the Hotel guests in South Africa, with a sample size of 200. Mixed-method approach with a quantitative survey measuring data privacy concerns and guest satisfaction, and semi-structured interviews exploring guest perceptions of data collection practices was used with an interview guide of questions focused on guest awareness of data collection, comfort level with data sharing practices, and preferred methods for hotels to manage guest data. Data analysis was used under descriptive statistics for survey data and thematic analysis for interview transcripts. Guests in South Africa expressed concerns about data privacy, particularly regarding the use of personal data for targeted marketing, a lack of transparency in data collection practices negatively impacted guest satisfaction. Hotels in South Africa must respect data privacy rights and be transparent about data collection and usage to develop clear privacy policies, offer opt-out options for data marketing, and invest in staff training on data privacy regulations.

Chen and Wu (2022) justified the impact of hotel data security breaches on guest trust and satisfaction where the target population was hotel guests who experienced a data security breach. The Sample Size of 250 and the method of in-depth interviews exploring guest experiences and perceptions of data security breaches were employed. The study experienced a thematic analysis where the study Findings revealed that data security breaches led to a significant decrease in guest trust and satisfaction. Therefore, it was revealed that the guests felt vulnerable and expressed concerns about the misuse of their personal information.

Recent empirical studies have increasingly highlighted the role of technology in shaping guest satisfaction across African hospitality markets. Dianawati *et al.* (2024) examined smart hotel technologies in African urban centers and found that user competency significantly influences perceived usefulness and satisfaction. Their study, which used Structural Equation Modeling (SEM-PLS), emphasized the importance of aligning technological features with guest readiness and digital literacy an insight particularly relevant for emerging markets like Rwanda. In a broader African context, D'Souza and D'Souza (2023) categorized hospitality innovations into product, process, market knowledge, and management innovations. Their findings revealed that process innovations such as mobile check-ins, digital concierge services, and automated room controls had the strongest impact on guest satisfaction. This suggests that operational technologies, when seamlessly integrated, can enhance the guest experience even in resource-constrained environments.

Biswas (2024) conducted a comprehensive study on technology-driven guest satisfaction and loyalty across African hotels, using a mixed-methods approach. The research found that mobile apps, keyless entry systems, and personalized in-room technologies significantly improved guest perceptions and loyalty intentions. Importantly, the study noted that the effectiveness of these technologies depends on contextual factors such as infrastructure, staff training, and cultural expectations elements that are particularly pertinent in Kigali's hotel sector. Despite these advancements, Rwanda-specific empirical studies remain limited. Most available research focuses on broader tourism development or ICT adoption in public services, leaving a gap in understanding how hotel technologies directly influence guest satisfaction. This study addresses that gap by providing localized evidence from Kigali's hospitality sector, examining how guest-facing technologies, staff support, and user experience contribute to satisfaction in a rapidly digitizing market.

3. METHODOLOGY

3.1 Research Design

This study used a descriptive research design where the researcher collected quantitative data using a questionnaire and qualitative data by interview exclusively to the hotel staff, and customers of the hotels respectively. The detailed information gathered by the help of the mixed approach.

3.2 Target Population

In this study, the researcher considered 120 people as the target population of the study by involving the staff members, customers, and stakeholders of Hotel des Milles Collins and Serena hotel in Nyarugenge District, Kigali, Rwanda.

3.3 Sample Design

Thus, the research used target population of 120 people in which a sample of 98 respondents is obtained. This included 48 hotel staff for both hotels, 48 hotel customers, and 2 hotel stakeholders totaling up a sample size of 98 respondents who participated in the study.

3.4 Sampling Techniques

In this study, among 120 people representing both hotels, the researcher drew only 98 respondents by purposive sampling technique. This implies that 98 respondents participated in this research. Purposive sampling was used in this study to intentionally select hotel staff and guests with direct experience of technology use in the selected Kigali hotels.

3.5 Data Collection Methods/ Instruments

The researcher used both a questionnaire and an interview guide to collect data. The questionnaire was used to collect quantitative data from hotel staff and customer respondents whereas the interview guide to hotel managers and stakeholders to obtain qualitative data. The questionnaire, had the Likert Scale based questions of 5 points, also a semi-structured interview guide-based questions related to the objectives of the research.

3.6 Data Analysis

The collected data were analyzed using SPSS where descriptive statistics, including means, frequencies, and standard deviations helped to summarize the data whereas correlation and regression analyses to test the relationships between independent and the dependent variables presented in form of tables and figures.

4. RESEARCH FINDINGS

4.1 Demographic Characteristics of Respondents

In this study, the demographic features of respondents were important and helped the researcher to assess the category of the respondents in terms of gender, age and education.

Table 1: Gender Group of Respondents

Gender group	Frequency	Percentage (%)
Male	61	62.2
Female	37	37.8
Total	**98**	**100.0**

Source: Primary data (2024).

In this table, the gender level of the respondents was important to assess their categories at Kigali Serena Hotel and Hotel des Mille Collines. So, among the respondents, 62.2% were male while 37.8% were female. This implies that there was a greater presentation of male respondents compared to the female respondents in the study sample. Significantly, with a high proportion of male respondents helps the hotel management to gain full insight about the preferences and expectations of the male clients hence committing to serve them.

This also can have implications on hotel marketing and promotional techniques to be able to attract and retain them, for example, once male respondents are likely to be more than female respondents, there could be a strategic technique needed for hotel management to increase the number of customers on both gender group. So, this provides a clear understanding on distribution of male respondents to assess the relationship between technology adoption and guest satisfaction among different sub-groups within gender population in terms of demographic nature of the respondents at Serena and Des Mille Collines selected hotels.

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4.2 Presentation of Findings

Objective 1: To analyze the effect of guest-facing technologies on guest satisfaction of selected hotels in Kigali, Rwanda

Table 2. Descriptive Statistics of Guest-Facing Technology on Guest Satisfaction

Descriptive statistics Statement on Guest-facing Technologies	N	Mean		Std. Deviation	Skewness	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error
The hotel's mobile application contributes to higher guest satisfaction	98	4.85	.037	.362	-1.957	.244
Investing in the hotel's mobile application has improved operational efficiency.	98	4.85	.037	.362	-1.957	.244
The data collected from the hotel's mobile application provides valuable insights into guest preferences and behavior.	98	4.85	.037	.362	-1.957	.244
The self-check-in kiosks contribute to higher guest satisfaction.	98	4.85	.037	.362	-1.957	.244
Investing in self-check-in kiosks has improved operational efficiency.	98	4.85	.037	.362	-1.957	.244
The self-check-in kiosks provide valuable data on guest check-in patterns and preferences.	98	4.85	.037	.362	-1.957	.244
The smart room features contribute to higher guest satisfaction.	98	4.85	.037	.362	-1.957	.244
Investing in smart room features has improved operational efficiency and reduced energy consumption.	98	4.85	.037	.362	-1.957	.244

Source: Primary data (2024).

Referring to table 2 above, the average rating for each statement is 4.85, indicating a strong positive agreement across all the statements. The standard error is 0.037, suggesting the sample means are stable and have little variability. A standard deviation of 0.362 implies that the responses are closely clustered around the mean, indicating little variation in opinions. The skewness values of -1.957, indicate that the distribution of responses is highly negatively skewed, showing that most ratings are at the higher end of the scale, further affirming positive perceptions of respondents of selected hotels in Kigali. The standard error of skewness is 0.244, which helps in understanding the precision of the skewness measurement. The mean score of 4.85 across all statements suggests that participants overwhelmingly agree that the technological features mobile app, self-check-in kiosks, and smart room features positively contribute to guest satisfaction and operational efficiency. The low standard deviation of 0.362 and standard error of 0.037 indicate that there is minimal variation among participants' responses. This consistency implies that the respondents share a similar viewpoint on the positive impact of this technological adoption. The negative skewness (-1.957) indicates that most responses are on the higher end of 4 and 5 on the scale, reinforcing the interpretation where participants have a strong perception about the positive effects of the

technologies being studied. All technologies studied Mobile applications, Self-check-in kiosks, Smart room features and Real-time information to customers are perceived as equally beneficial. The data strongly suggest that investments in technological features such as mobile applications, self-check-in kiosks, and smart room features significantly enhance guest satisfaction and operational efficiency in the hotel industry. The uniformly high ratings with low variability and skewness towards positive values indicate that these technologies are highly valued by the respondents, confirming their effectiveness and impact. Therefore, this leads to a positive perception of customers and employees of Serena and des Mille Collines Hotels on guest-facing technologies towards the technology adoption and guest satisfaction.

Objective 2: To evaluate the effects of technology training and support on guest satisfaction of selected hotels in Kigali, Rwanda

The information collected from research participants was to elaborate on the effect of technology training and support on guest satisfaction of selected hotels in Kigali, Rwanda aiming at assessing whether the use of technology training and support has an impact on guest satisfaction in the selected hotels.

Table 3: Descriptive statistics of technology training and support on guest satisfaction

Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
The support provided for using guest-facing technologies has enhanced our ability to meet guest needs.	98	4	5	4.81	.397	-1.573
The quality of guest service has improved as a direct result of comprehensive technology training programs.	98	4	5	4.81	.397	-1.573
Training on tech-enabled amenities (e.g., smart room features, mobile applications) has improved guest satisfaction.	98	4	5	4.81	.397	-1.573
The support provided for maintaining and using tech-enabled amenities has reduced guest complaints.	98	4	5	4.81	.397	-1.573
Investing in technology training for staff regarding tech-enabled amenities has been beneficial for guest experiences.	98	4	5	4.81	.397	-1.573
Valid N (listwise)	98					

Source: Primary data (2024)

The research findings from Table 3 above, aimed to evaluate the effects of technology training and support on guest satisfaction of selected hotels of Serena and des Mille Collines hotels in Kigali, Rwanda. The table presents responses from respondents on various statements related to the effects of technology training and support on guest satisfaction, and the average scores and standard deviations determined to evaluate the level of guest satisfaction at these hotels. The overall average guest satisfaction score for technology training and support is 4.81, with a standard deviation of 0.397, indicating a relatively high level of satisfaction with technology training and support in the hotels. Specifically, providing real-time information to guests which contributes to higher guest satisfaction, investing in systems for real-time information delivery

has improved operational efficiency contributes to higher guest satisfaction, the data collected from real-time information systems provides valuable insights into guest preferences confirmed by 84.7% of the entire respondents from both hotels whereas only 15.3% of respondents at both hotels agreed that technology training and support have contributed to a noticeable reduction in operational costs also the efficiency gains from technology training justify the investment made in these programs, as observed that when hotels enhance guest satisfaction as evaluated from the respondents of Serena and hotel des Mille Collines hotels. This indicates that the effect of technology training and support effectively expands the hotels' technological footprint and its banding system and empowering its employees towards guest satisfaction. Generally, the findings suggest that respondents at Serena hotel and hotel Des Mille Collines believe that technology training and support as strongly contributes to the guest satisfaction as by strongly agreed approved by 84.7% of the entire respondents. However, there is a need for improvement on addressing customer problems immediately for the sustainability of a noticeable success and profitability of the hotels through reduction in operational costs and feed backs. The research findings provide a correlation analysis, which assesses how well the predictors relate to guest satisfaction as shown below;

Objective 3: To analyze the effect of user experience on guest satisfaction of selected hotels in Kigali, Rwanda

This objective provided information related to the effect of user experience on guest satisfaction in the selected hotels of Serena hotel and hotel des Mille Collines in Kigali Rwanda. This provides the image at which the user experience affects guest satisfaction at Serena hotel and hotel des Mille Collines. The information collected is summarized in table 4 below;

Table 4: Descriptive statistics "Integration of user experience on guest satisfaction"

Descriptive Statistics

Statements on User experience	Mean	Std. Deviation	N
Gender	1.38	.487	98
The integration of new technologies has significantly enhanced our hotel's brand image.	4.66	.475	98
Positive user experiences with our hotel's technology offerings contribute to a better perception of our brand.	4.66	.475	98
Our investment in technology integration has positively affected the reputation of our hotel among guests.	4.66	.475	98
The integration of user-friendly technologies has reduced stress for both guests and staff.	4.66	.475	98
Training and support for new technologies have made daily operations less stressful for our team.	4.66	.475	98
Guests experience less stress during their stay due to the seamless integration of technology in our services.	4.66	.475	98
Integrated technology systems have enabled us to provide more personalized services to our guests.	4.66	.475	98
User experience enhancements through technology have allowed us to better cater to individual guest preferences.	4.66	.475	98
Personalization features offered by our integrated technologies have significantly improved guest satisfaction.	4.66	.475	98
The integration of advanced technologies has increased the perceived value of our services among guests.	4.66	.475	98
Guests recognize the benefit provided by our tech-enabled amenities and services.	4.66	.475	98
The user experience enhancements through technology have led to a higher perceived value of staying at our hotel.	4.66	.475	98

Source: Primary data (2024)

The findings from Table 4 above, indicate the effect of user experience on guest satisfaction at Serena hotel and des Mille Collines in Kigali. The mean scores of 4.66 for all the variables under user experience on guest satisfaction are relatively

high, which suggests that the integration of user experience has a positive impact on guest satisfaction. The overall standard deviation value of 0.475 indicates that the responses are relatively consistent and clustered around the mean, reflecting a relatively narrow spread of scores. Assessing the level at which user experience has over the guest satisfaction at Serena hotel and Des Mille Collines, the research findings showed overall percentage of 83% of the respondents at both hotels whose frequency of responses for various statements under user experience indicated strongly agree relatively with high effect of user experience on guest satisfaction indicated by 17% of the respondents who also responded with agree. Moreover, personalization innovation plays a significant role in influencing guest satisfaction at Kigali Serena hotel and hotel des Mille Collines based on the respondents' perception captivates the positive impact of user experience on guest satisfaction within the hotel setting which also enhances guest experience, significantly showed by their overall response rate generally suggesting high effect of user experience on guest satisfaction at these given hotels.

Table 5. Correlation analysis "Integration of user experience on guest satisfaction"

Correlations

		Guest Satisfaction	Integration of User experience
Guest Satisfaction	Pearson Correlation	1	.066
	Sig. (2-tailed)		.518
	N	98	98
Integration of User experience	Pearson Correlation	.066	1
	Sig. (2-tailed)	.518	
	N	98	98

Source: Primary Data (2024)

This table shows the correlation analysis between guest satisfaction and integration of user experience reveals that Pearson correlation coefficient indicates the value of 0.066, indicating a very weak positive relationship. This suggests that changes in the integration of user experience have a minimal impact on guest satisfaction. Significance (Sig.) shows the p-value as 0.518, which is greater than 0.05. This means the correlation is not statistically significant, implying that the observed relationship could be due to random chance. This could definitely mean that is a very weak and statistically insignificant relationship between Guest Satisfaction and Integration of user experience suggesting that, the integration of user experience does not have a clear impact on guest satisfaction.

Table 6. Regression analysis "Integration of user experience on guest satisfaction"

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.066[a]	.004	-.006	1.078	.004	.422	1	96	.518

a. Predictors: (Constant), Integration of User experience

The regression analysis between guest satisfaction and integration of user experience reveals R as 0.066, indicating a very weak positive relationship. R Square: 0.004, meaning only 0.4% of the variance in Guest Satisfaction is explained by Integration of user experience. Adjusted R Square of -0.006, suggests the model does not explain the variance well. The Std. Error of the Estimate of 1.078, indicates a poor fit of the model whereas the model does not significantly improve the prediction of guest satisfaction with F Change of 0.422 with the associated p-value (Sig. F Change) of 0.518 showing that the model is not statistically significant at the conventional 0.05 level. This means a very weak and statistically insignificant relationship between Integration of user experience and guest satisfaction. The independent variable explains only a small portion of the variance in guest satisfaction.

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Table 7: ANOVA "Integration of user experience on guest satisfaction"

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.490	1	.490	.422	.518[b]
	Residual	111.561	96	1.162		
	Total	112.051	97			

a. Dependent Variable: GuestSatisfaction

b. Predictors: (Constant), Integration of User experience

In table 7, the regression model explains a very small portion of the variance in guest satisfaction where the sum of squares for regression is 0.490. The F-statistic (0.422) and its significance (0.518. This indicates that the model does not significantly predict guest satisfaction. The independent variable (Integration of user experience) is not a significant predictor of guest satisfaction.

Table 8: Coefficients "Integration of user experience on guest satisfaction"

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.129	1.080		2.897	.005
	Integration of User Experience	.150	.230	.66	.649	.518

Source: Primary Data (2024)

Dependent Variable; Guest satisfaction
Predictors: (Constant), Integration of User Experience

Guest satisfaction is negatively affected by negative coefficients and positively affected when with positive coefficients. The findings from table 8, present the coefficients resulting from the regression analysis to analyze the effect of technology training and support on overall Guest satisfaction (GS AVER) in the context of Serena and des Mille Collines hotels in Kigali. The coefficients indicate the relationship between each predictor variable and the dependent variable. The Constant (B) is 3.129 which represents the expected guest satisfaction score when all predictor variables become zero. The standardized coefficients (Beta) show the relative significance of each predictor in understanding guest satisfaction. Among the factors such as improved efficiency and cost reduction, enhanced communication, improved guest service, tech-enabled amenities, and feedback and improvement. This can suggest that these factors of technology training and support have a strong relationship with higher guest satisfaction score of 4.88. On the other hand, improved guest services (Beta =0.00) and "Enhanced communication (Beta= 0.78) have relative effect on guest satisfaction. However, it is important to note that all the standardized coefficients are small, indicating that the user experience collectively have a moderate impact on guest satisfaction. The t- values associated with p-values assess the statistical significance of each predictor variable. The results indicate that "improved efficiency and cost reduction, tech-enabled amenities, and feedback and improvement, p = -0.544, -0.544 and 0.632 respectively are statistically significant predictors of guest satisfaction.

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Objective 4: To analyze the effect of data security and privacy on guest satisfaction of selected hotels in Kigali, Rwanda

Table 9: Descriptive statistics "Data security and privacy on guest satisfaction"

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	statistic		Std. Error	Statistic	Std. Error
The integration of new technologies has significantly enhanced the overall customer experience at our hotel.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
User-friendly technological features have improved the satisfaction levels of our guests.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
The support and training provided for new technologies have positively affected the guest experience.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Our hotel's ability to adapt to changing technology trends has improved our service offerings.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Staying updated with technological advancements has been beneficial for meeting guest expectations.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Continuous adaptation to new trends has positioned our hotel as a modern and innovative establishment.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Seamless integration of technology into our hotel operations has streamlined our processes.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
The integration of various technological systems has reduced operational inefficiencies.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Technology integration has enhanced the overall efficiency and effectiveness of our services.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
The integration of advanced technologies has positively influenced our hotel's brand image.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Technological innovations have enhanced our reputation as a leading hotel in the industry.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Investments in technology have contributed to a stronger and more positive brand perception among guests.	98	4	5	4.66	.475	-.702	.244	-1.539	.483
Valid N (listwise)	98								

Source: **Primary data (2024).**

The objective of this analysis was to assess the effect of data security and privacy and they contribute to guest satisfaction in the Serena and des Mille Collines in Kigali. The results indicate that the overall average mean of guest satisfaction level is 4.41, with a standard deviation of 0.824. The table 9, presents the findings related to guest satisfaction at Kigali Serena hotel and des Mille Collines in Kigali. In regard to the specific statements, the overall majority of respondents by 66.3% strongly agreed whereas only 33.7 % put agree. These findings indicate moderately high level of data security and privacy effect on guest satisfaction under its respective predictors of enhanced customer experience, adaptation to changing trends, technological integration, feedback loops to continuous improvements, brand image and reputation. This indicates that customers appreciate innovative services brought about by the integration of advanced technologies that increase the perceived value of our services among guests. Overall, the findings suggest that the hotel survey has a satisfactory level of guest satisfaction. Noting that, while these findings provide valuable insights into guest satisfaction, further research and analysis may be needed to explore other factors that could influence satisfaction levels in the hotel industry. In addition, continuous evaluation and feedback from customers about data safety and privacy which can strongly contribute to the hotel performance and productivity due to further innovative ideas that can be put by hotel employees towards guest preferences and satisfaction at Kigali Serena hotel and des Mille Collines hotel in Kigali Rwanda.

5. DISCUSSION OF RESEARCH FINDINGS

This study examined the role of technology adoption in enhancing guest satisfaction in Kigali's hotel industry. The findings can be interpreted through the lens of the Technology Acceptance Model (TAM), which emphasizes perceived usefulness and ease of use as critical factors in technology adoption. In the hospitality context, guest-facing technologies such as mobile applications, chatbots, self-service kiosks, and smart-room controls have been widely recognized for improving convenience, efficiency, and the overall service experience (Dianawati *et al.*, 2024; Biswas, 2024). The Kigali experience suggests that such tools must not only be intuitive but also supported by trained staff, since satisfaction is highest when digital solutions complement, rather than replace, personalized service.

User experience also emerged as an important determinant of guest satisfaction. Global studies highlight that well-designed digital systems enhance efficiency, communication, and service delivery, while responsive staff engagement ensures guests feel supported (D'Souza & D'Souza, 2023; Ndung'u & Okumu, 2023). Research from developed hospitality markets such as Singapore and Dubai underscores the significance of interface design and the personalization of digital interactions in building satisfaction (Lee & Kozinet, 2023).

For hotels in Kigali, this implies that investing in user-friendly platforms and staff digital literacy training can help balance technological innovation with the human touch. Data security and privacy represent another dimension of technology-driven guest experiences. Prior research shows that breaches undermine trust and satisfaction (Chen & Wu, 2022), while visible and transparent privacy protocols reassure guests and reinforce brand reputation (Biswas, 2024). Although guests may not always perceive these measures directly, their importance lies in the trust-building potential they create. Hotels that integrate robust data protection systems while clearly communicating these safeguards are better positioned to maintain customer confidence. Taken together, these insights reaffirm the relevance of TAM while highlighting the need for contextual adaptation in emerging markets. Unlike settings where technology engagement is voluntary, guests in Kigali encounter digital systems as part of standard service delivery. This points to the importance of hybrid service models that leverage digital tools for efficiency and convenience, while preserving human interaction as a core element of satisfaction. By combining intuitive technologies, transparent privacy practices, and strong staff support, Kigali's hotels can enhance guest experiences, sustain competitiveness, and foster long-term customer loyalty.

5.1 Conclusion

The study aimed to examine the effect of technology adoption on guest satisfaction in selected hotels in Kigali, Rwanda, specifically at Kigali Serena hotel and Hotel des Mille Collines. While guest-facing technologies demonstrated a moderate and statistically significant influence on satisfaction, their impact was contingent on usability and staff facilitation underscoring the limitations of technology when divorced from human-centered service. Staff support emerged as the most consistent predictor of satisfaction, reinforcing the argument that digital transformation must be accompanied by robust capacity-building and service culture enhancement. Contrary to expectations and global literature, data security and privacy showed no significant effect on guest satisfaction, suggesting that in the Rwandan context, guests may either lack awareness of digital risks or prioritize tangible service elements over backend protocols. Similarly, the weak relationship between user experience integration and satisfaction challenges the universality of model like TAM indicating that interface design alone

does not guarantee positive outcomes unless it resonates with local expectations and is embedded in a supportive service environment. These findings imply that technology adoption in hospitality is not a linear driver of satisfaction but a layered process shaped by cultural norms, operational readiness, and guest demographics. For hotel managers, this necessitates a strategic shift from technology deployment to technology enablement where digital tools are not merely installed but actively supported, personalized, and communicated. For policymakers and educators, the results highlight the need for localized frameworks and longitudinal research to guide Rwanda's digital hospitality roadmap within the broader East African context. Ultimately, guest satisfaction in Kigali hotels is best achieved through a hybrid model that blends innovation with empathy, automation with human touch, and global standards with local relevance.

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