Revolutionizing Hotel Operations with AI: A Case Study on the Power of ChatGPT and Gemini Integration

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This study investigates the implementation and impact of ChatGPT and Gemini in a four-star hotel in Ao Nang, Krabi, Thailand, during January–February 2024. Through a mixed-methods approach combining quantitative analysis and qualitative insights, the research assessed operational metrics across multiple service areas and gathered detailed feedback from the hotel owner. The study revealed significant improvements in operational efficiency, with check-in processing times decreasing from 3.3 to 2.7 minutes and AI system adoption increasing from 82% to 93%. Guest satisfaction scores showed notable enhancement, with overall satisfaction rising from 4.6 to 4.8 out of 5. The AI systems demonstrated impressive multilingual capabilities, handling 28 languages with 98.7% accuracy, while document processing achieved 99.2% accuracy across various types. Internal communications benefited from 32% time savings, with efficiency rates exceeding 96% across all categories. Staff adaptation, though initially challenging, was successfully managed through comprehensive training and gradual implementation, resulting in improved job satisfaction and team collaboration. The findings provide empirical evidence that strategic AI integration can enhance both operational efficiency and guest satisfaction while complementing human service elements. This research contributes valuable insights for hospitality managers considering AI implementation and offers a practical blueprint for successful technology integration in the hospitality sector, while also highlighting areas for future research in different hotel categories and geographical contexts.

Keywords: AI integration, ChatGPT, Gemini, hospitality, operational efficiency

Introduction

The past few years have seen remarkable growth in artificial intelligence (AI) systems, which have had an unprecedented impact on human creativity and productivity. These advancements have reshaped industries and revolutionized workflows, enhancing efficiency, enabling new forms of innovation, and unlocking creative possibilities that were once considered out of reach (Imran & Almusharraf, 2024; Rashid & Kausik, 2024). The hospitality industry, encom-

passing accommodations, food and beverage services, travel, and entertainment, serves as a cornerstone of the global economy, thriving on its ability to meet and exceed customer expectations. This dynamic, service-oriented sector continually adapts to evolving consumer behaviours, shifting market trends, and rapid technological advancements. Among these innovations, the integration of AI has emerged as a transformative force, redefining operational efficiency, elevating customer experiences, and driving industry competitiveness to new heights (Fatema et al., 2024; Hernández et al., 2023; Nayak & Bhinder, 2024; Sampaio et al., 2024). In late 2022, the Chat Generative Pre-Trained Transformer (ChatGPT) was introduced, representing a notable leap forward in AI. This advanced chatbot leverages deep learning to execute a wide range of language-related tasks with remarkable fluency, resembling human communication. Unlike earlier AI systems, ChatGPT's neural networks are trained on vast datasets, including simulated dialogues, allowing it to generate nuanced and conceptually detailed responses that closely mimic human interaction. This innovation has the potential to transform education and information sharing, showcasing its impressive technological capabilities (Dwivedi et al., 2023; Polyportis & Pahos, 2024). Gemini, a multimodal AI tool launched on December 6, 2023, is developed by Google DeepMind and utilizes Visual Language Model (VLM) technology. Positioned as a direct competitor to OpenAI's ChatGPT, GPT-4, and the vision-enabled GPT-4, Gemini integrates multiple large language models (LLMs) along with advanced natural language processing (NLP) technologies. Gemini has proven to be a valuable tool for addressing challenges in reinforcement learning, deep learning, and tasks related to digital education. Its interdisciplinary applications pave the way for integrating AI technologies across various sectors, fostering future advancements in technology, collaboration, and innovation. Particularly beneficial for researchers, educators, and digital content creators, Gemini facilitates diverse responses and aids in generating solutions for innovations in learning. Its potential extends across fields such as education, healthcare, management, and climate change, driving progress through

the integration of generative AI (Imran & Almusharraf, 2024).

AI is transforming the hospitality industry by driving innovation, improving operational efficiency, and enhancing customer experiences. AI-powered tools and systems are increasingly being utilized to personalize guest services, automate routine tasks, and optimize decision-making processes. From chatbots and virtual assistants providing round-the-clock customer support to predictive analytics tools that help forecast demand and tailor marketing strategies, AI is redefining the way hospitality businesses operate (Bulchand-Gidumal et al., 2023; Gajić et al., 2024; Kumar et al., 2024; Zahidi et al., 2024). Moreover, AI's integration into revenue management, housekeeping operations, and guest feedback analysis allows for more precise and timely interventions, boosting overall productivity and customer satisfaction. As the industry adapts to the challenges of the digital age, the adoption of AI technologies underscores a commitment to innovation and a focus on creating seamless and memorable experiences for travellers and guests (Anwar et al., 2024; Correia et al., 2024; Gatera, 2024). Given its transformative potential, AI in the hospitality industry is a critical area of research. While numerous studies have explored AI's theoretical applications and potential benefits in the hospitality sector, there remains a lack of empirical research examining the real-world implementation, operational impact, and staff adaptation to these technologies in actual hotel environments. Existing literature primarily discusses AI's potential for improving guest experiences and automating routine tasks. However, most studies fail to provide quantitative evidence of AI's tangible impact on key performance metrics such as check-in processing times, guest satisfaction, and internal communications. Additionally, research often overlooks the challenges associated with AI adoption, including employee adaptation, multilingual capabilities, and integration with existing hotel management systems. For instance, Limna and Kraiwanit (2023) qualitatively explored the impact of ChatGPT on customer service in the hospitality industry by examining the experiences and perceptions of hospitality employees who utilized ChatGPT in their customer interactions. Their

study found that integrating ChatGPT into hospitality services had a significant positive impact by enhancing employee skills and knowledge, bridging language barriers, providing valuable recommendations, and improving productivity and workflow management. Ultimately, they concluded that ChatGPT is a valuable tool for improving customer service, leading to a better overall guest experience. While their research highlights the benefits of AI in hospitality, it does not offer quantitative metrics or examine AI's broader impact on operational efficiency, guest satisfaction, and internal communication. Hence, this study addresses these gaps by conducting a case study on a four-star hotel in Ao Nang, Krabi in Thailand, examining the practical effects of ChatGPT and Gemini on various operational aspects. Ao Nang in Krabi was selected due to its status as one of Thailand's top international tourist destinations, attracting a diverse clientele from various linguistic and cultural backgrounds. Given its high tourist influx and competitive hospitality sector, hotels in Krabi face constant pressure to enhance service efficiency, improve guest satisfaction, and optimize operations, making it an ideal location to assess the real-world impact of AI integration. Through a mixed-methods approach, the research provides empirical data on AI's role in improving service efficiency, guest satisfaction, and internal workflows while also exploring staff perceptions and adaptation challenges. By offering context-specific insights, this study contributes to a more nuanced understanding of AI's potential and limitations in the hospitality industry, ultimately informing hotel managers, policymakers, and technology developers on best practices for AI implementation.

Literature Review

Artificial Intelligence (AI) in the Hospitality Industry

The Fourth Industrial Revolution marks a transformative era defined by the seamless integration of digital technologies, including AI, chatbots, and robotics, into everyday life. This revolution is reshaping the processes of innovation and distribution, influencing not only economic structures but also the social interactions and daily experiences of individuals. Like many other sectors, the hospitality industry is embracing AI technologies at an accelerating pace, reflecting their growing significance and transformative potential (Abdelfattah et al., 2023; Fakfare et al., 2025). The integration of AI in the hospitality industry has been extensively explored in recent literature, highlighting its transformative potential across various operational and customer-facing domains. AI technologies, such as machine learning (ML) and NLP, are reshaping traditional workflows by automating repetitive tasks, enhancing service delivery, and providing data-driven insights for strategic decision-making. For instance, AI-powered chatbots and virtual assistants have revolutionized customer interactions by offering 24/7 personalized support, improving response times, and increasing customer satisfaction. Predictive analytics, driven by AI algorithms, enables precise demand forecasting, dynamic pricing, and resource optimization, allowing businesses to remain competitive in fluctuating markets. Additionally, AI applications in robotics, such as automated check-ins, cleaning systems, and food preparation, address labour shortages and ensure consistency in service quality (Ivanov & Webster, 2019; Thaichon et al., 2024; Venkateswaran et al., 2024; Zahidi et al., 2024). Furthermore, the literature also emphasizes the role of AI in hyper-personalization, which has become a critical differentiator in guest experiences. Advanced data analytics allow businesses to analyse customer preferences and behavioural patterns, enabling tailored recommendations, bespoke travel packages, and individualized services. However, scholars also underscore challenges associated with AI adoption, including high implementation costs, workforce displacement, data privacy concerns, and the need for upskilling employees to manage and interact with AI systems effectively. As the hospitality industry continues to embrace AI, ongoing research explores the balance between technological innovation and the preservation of the human touch, a hallmark of hospitality services. This dual approach ensures that AI not only enhances operational efficiency but also enriches the overall customer experience, positioning the industry for sustained growth in the digital age (Busulwa, 2020; Nam et al., 2021; Said, 2023; Zirar et al., 2023).

ChatGPT

Recent studies, including those by Abdullah (2023), Gursoy et al. (2023), Rather (2024), and Wang (2024), have explored the transformative role of ChatGPT, a generative AI tool developed by OpenAI, in the hospitality industry, emphasizing its potential to enhance customer interactions, streamline operations, support staff productivity, and other benefits. As an advanced conversational AI tool, ChatGPT excels in delivering personalized, real-time customer service across various touchpoints, from pre-booking inquiries to post--stay feedback. It is particularly effective in managing high volumes of queries, providing detailed responses to frequently asked questions, and offering multilingual support, which is critical in the globalized nature of the hospitality sector. Moreover, beyond customer interaction, ChatGPT has been integrated into marketing and content creation, aiding businesses in crafting engaging promotional materials, designing tailored travel itineraries, and generating compelling descriptions for accommodations and services (Almeida & Ivanov, 2024; Bansal et al., 2024; Patil et al., 2024; Singh & Singh, 2024). Furthermore, its ability to analyse sentiment and feedback from customer reviews enables hoteliers to identify service gaps, track customer satisfaction trends, and make data--informed decisions for continuous improvement. In addition, studies also highlight ChatGPT's utility in staff training, where it can simulate realistic customer scenarios, enabling employees to practice and enhance their communication and problem-solving skills. Despite its advantages, the literature notes challenges, including potential inaccuracies in complex queries, the risk of over-reliance on automation, and the need to address ethical concerns such as data privacy and bias in AI-generated content. Researchers advocate for a hybrid approach, combining ChatGPT's efficiency with human oversight to ensure a balance between technological innovation and the personalized, empathetic service that defines the hospitality industry. As the adoption of ChatGPT grows, its impact on reshaping operational models and enhancing customer experiences continues to be a pivotal area of inquiry in hospitality research (Elmohandes & Marghany, 2024; Jeong & Lee, 2024; Rather, 2024; Wang, 2024).

Gemini

Gemini, Google's advanced generative AI model, is gaining attention in the hospitality industry for its capacity to redefine service delivery, customer engagement, and operational efficiency. Leveraging its multimodal capabilities, Gemini integrates text, image, and contextual data processing to provide highly personalized and adaptive solutions. In the hospitality context, Gemini's strengths lie in crafting nuanced responses to customer inquiries, generating visually engaging marketing materials, and assisting in dynamic itinerary planning. For example, Gemini can create tailored travel recommendations by analysing customer preferences and trends, offering a more immersive and customized planning experience. Its advanced natural language understanding and contextual reasoning enhance chatbot interactions, ensuring precise and empathetic communication that resonates with diverse customer bases (Kewalramani & Rosen, 2024; Rane et al., 2024; Raulin, 2024; Visser, 2024). Moreover, Gemini's predictive capabilities allow hoteliers to anticipate guest needs, optimize resource allocation, and enhance demand forecasting accuracy. It also plays a crucial role in content creation, automating the design of promotional campaigns, virtual tours, and property descriptions that captivate potential customers. However, the literature also points to challenges, including the steep learning curve associated with implementing advanced AI models, the need for robust data governance frameworks, and concerns over ethical considerations such as privacy issues. Scholars suggest that the integration of Gemini should be complemented by human oversight to ensure that its deployment enhances, rather than diminishes, the core human-centric values of hospitality. As research evolves, Gemini's contributions to innovation and efficiency continue to position it as a transformative tool in the hospitality sector's digital transformation journey (Saeidnia, 2023; Skubis et al., 2024; Singh, 2025).

Related Research

The hospitality industry is undergoing a significant transformation with the adoption of advanced technologies, including generative AI like ChatGPT. Singh and Singh (2024) highlight the potential of ChatGPT

to revolutionize the sector and empower emerging hoteliers. By leveraging ChatGPT, hotels can offer round-the-clock support to guests, addressing inquiries, suggesting local attractions, and streamlining reservation processes. Its ability to process and respond to natural language enhances guest experiences, fostering comfort and satisfaction. Moreover, ChatGPT enables hoteliers to extract valuable insights from customer interactions, facilitating data-driven decisions and personalized services. With its capacity for sentiment analysis, ChatGPT can help identify potential issues, allowing hoteliers to address concerns proactively, thereby ensuring guest loyalty and satisfaction. This integration of AI positions the hospitality industry to deliver more efficient, tailored, and responsive services. Furthermore, Dwivedi et al. (2024) examined current practices and challenges associated with implementing generative AI tools, including ChatGPT, in the hospitality and tourism sector, while also proposing a comprehensive research agenda. The study emphasizes that the integration of generative AI technologies, like ChatGPT, has the potential to revolutionize the industry. However, it also underscores the multifaceted challenges these technologies pose, considering the perspectives of businesses, customers, and regulatory bodies.

Gursoy et al. (2023) also highlight the widespread popularity and transformative impact of ChatGPT. With advanced features such as natural language processing and contextual awareness, ChatGPT is recognized as a disruptive innovation poised to revolutionize operations across various sectors, including hospitality and tourism. Its adoption is expected to significantly alter how customers search for information, make decisions, and how businesses deliver personalized services and experiences. Moreover, Talukder and Kumar (2024) explored the role of AI, particularly ChatGPT, in enhancing customer support within the hotel industry. The adoption of AI-driven solutions has significantly transformed how hotels and other hospitality businesses engage with their clientele. AI-powered chatbots, such as those utilizing ChatGPT, have been employed to handle routine inquiries, provide 24/7 assistance, offer personalized recommendations, and support multilingual commu-

nication. These systems are frequently integrated with existing hotel management platforms and are continuously refined based on guest feedback. Despite these advancements, the study highlights the importance of maintaining a balance between AI automation and human interaction to deliver unique and memorable experiences for hotel guests.

Ilieva et al. (2024) investigated the impact of generative AI on the tourism industry, introducing a novel theoretical framework for implementing and evaluating these tools in travel companies and among individual tourists. This framework was applied to assess the role of generative AI chatbots in planning both international and domestic trips within budgetary constraints. For international travel, ChatGPT offered a balanced solution from a tourism company's perspective, combining service quality, experience diversity, and time efficiency, though it did not excel in any single domain. Tourists found the experience satisfactory, providing good value for money, but it failed to exceed expectations, positioning it as a reliable yet unremarkable mid-tier option. Conversely, Gemini excelled in experience diversity by offering a broader range of locations, but lower service quality negatively impacted overall satisfaction. While budget-conscious tourists might appreciate the variety, they could find the accommodations and services lacking. Regarding domestic travel, ChatGPT delivered a diverse itinerary featuring a mix of nature, cultural experiences, and moderate hiking. Tourists enjoyed the variety, including eco-paths, UNESCO sites, and scenic views, resulting in high satisfaction. However, time efficiency was slightly compromised due to long travel distances. Gemini, on the other hand, provided a straightforward and balanced trip with cultural visits and some hiking opportunities. Although its service quality and customer satisfaction were reasonable, its lack of activity diversity made the experience somewhat repetitive. Overall, while both tools demonstrated strengths in specific areas, their performance varied depending on the trip type and priorities of the users.

Methodology

This study employed a mixed-methods approach, combining quantitative data analysis with qualitative

insights through a detailed case study of a four-star hotel in Ao Nang, Krabi, Thailand. The research was conducted over a two-month period from January to February 2024, focusing on the implementation and impact of two AI tools: ChatGPT and Gemini. This time frame allowed for a comprehensive assessment of the AI systems' performance, adaptation, and impact on various operational metrics. The sampling strategy utilized purposive sampling, selecting a four-star hotel with 180 rooms and 120 full-time equivalent employees. This property was chosen due to its representative size, market position, and its recent implementation of AI tools, making it an ideal candidate for examining the practical applications and impacts of AI in hospitality operations. The hotel's location in Ao Nang, a popular tourist destination, provided exposure to diverse international clientele, enabling a broad assessment of AI capabilities in managing multilingual and multicultural guest interactions.

Data collection encompassed multiple sources and methods to ensure comprehensive coverage of AI implementation impacts. Quantitative data was gathered through the hotel's property management system, which tracked operational metrics including check-in processing times, response rates, document processing efficiency, and guest satisfaction scores. The researchers collected detailed performance data across seven key operational areas: front desk operations, guest inquiries, email responses, internal communications, document processing, translation services, and guest satisfaction ratings. Additionally, the qualitative component of this study consisted of semi-structured, in-depth interviews with the hotel owner to explore the integration of AI, its impact on operational efficiency, and its role in managerial decision-making. The interviews followed a structured guide, addressing key areas such as the implementation process, which included staff training and system customization, as well as improvements in workflow, response times, and service quality. Additionally, the discussion covered guest experiences, particularly in relation to AI-driven interactions, multilingual support, and overall satisfaction. Challenges and adaptation strategies were also examined, focusing on initial resistance, staff perceptions, and the effective-

ness of training programmes. Lastly, the interviews explored the strategic implications of AI, including its influence on business planning, data-driven decision-making, and competitive positioning. Each session lasted approximately 45 to 60 minutes and was recorded and transcribed for analysis, ensuring a comprehensive understanding of AI adoption within the hotel setting.

The data analysis followed a systematic approach, combining descriptive statistics and trend analysis. Quantitative data was analysed to identify patterns in operational efficiency, calculating growth rates, processing times, and accuracy rates across different service categories. Performance metrics were tracked weekly to observe progression in AI adoption and efficiency gains. The analysis included comparative assessments between January and February performance data to measure improvement trends. Guest satisfaction scores were analysed using a 5-point Likert scale, with results aggregated to evaluate changes in overall satisfaction, staff responsiveness, problem resolution, and communication clarity. For qualitative data, a thematic analysis approach was employed to examine interview transcripts, systematically identifying key themes related to AI adoption, operational impact, and strategic considerations. The analysis followed a rigorous process to ensure depth and accuracy in data interpretation. First, initial coding was conducted to extract significant statements and categorize them into relevant themes using an open coding approach. This was followed by pattern identification through axial coding, which analysed recurring themes such as efficiency gains, staff adaptation, and guest satisfaction. To enhance reliability, triangulation was applied by cross-referencing qualitative insights with quantitative performance trends, providing a comprehensive understanding of AI's role in hotel operations. Additionally, member checking was conducted, allowing the interviewee to review and validate interpretations, ensuring accuracy in thematic analysis. Finally, reflexivity was maintained throughout the process, acknowledging potential biases and ensuring that data interpretations remained grounded in the collected evidence. By systematically integrating both quantitative metrics and qualitative

Table 1   Hotel Profile

Characteristic	Description
Hotel Category	4-Star Hotel
Location	Ao Nang, Krabi, Thailand
Number of Rooms	180 Rooms
Staff Size	120 (Full-Time Equivalent)
Average Occupancy	January, 2024: 72% and February, 2024: 78%
AI Implementation	ChatGPT and Gemini

perspectives, these comprehensive methodological approaches enabled the researchers to gather rich, detailed data about the practical implementation and impact of AI tools in a real-world hospitality setting, providing valuable insights for both academic understanding and industry application.

Results

The researchers conducted an in-depth interview with a hotel owner to gain insights into the practical impacts of implementing AI tools, specifically ChatGPT and Gemini, on daily operations, customer interactions, and overall business performance. Focusing on a two-month analysis of AI implementation, the hotel owner provided detailed information about key performance metrics, including occupancy rates, response times and others. During the interview, the hotel owner highlighted specific improvements resulting from these tools, such as enhancements in guest sa-

tisfaction scores due to quicker response times and measurable increases in employee productivity.

As detailed in Table 1, the case study was conducted over a two-month period (January–February 2024) at a 4-star business hotel with 180 rooms and a workforce of 120 full-time equivalent employees. During the study, the hotel experienced positive growth in occupancy rates, rising from 72% in January to 78% in February. This upward trend in occupancy highlighted the hotel's robust market performance and created an optimal testing environment for the newly implemented AI systems, ChatGPT and Gemini.

Table 2 highlights the systematic progression in efficiency and adoption during the implementation of ChatGPT and Gemini within front desk operations. The initiative commenced in January Week 1, achieving an initial 82% AI usage rate by processing 201 out of 245 check-ins at an average time of 3.3 minutes. This early phase involved intensive staff training to overcome the learning curve. By Week 2, notable advancements were evident, with an 85% AI adoption rate (219 of 258 check-ins) and a reduced processing time of 3.1 minutes, signifying enhanced staff confidence and system optimization. Week 3 furthered this trend, with the system managing 231 out of 262 check-ins (88% usage) at an average time of 3.0 minutes, bolstered by the integration of advanced features like predictive guest services. The month concluded with Week 4 achieving a 90% usage rate (257 of 285 check-ins) and an average processing time of 2.9 minutes, driven

Table 2   January and February Performance Metrics

Period	Check-Ins	AI Processed	Averae Time	AI Usage
Week 1 (January 1–7)	245	201	3.3 Minutes	82%
Week 2 (January 8–14)	258	219	3.1 Minutes	85%
Week 3 (January 15–21)	262	231	3.0 Minutes	88%
Week 4 (January 22–31)	285	257	2.9 Minutes	90%
Week 5 (February 1–7)	268	244	2.8 Minutes	91%
Week 6 (February 8–14)	272	250	2.8 Minutes	92%
Week 7 (February 15–21)	280	260	2.7 Minutes	93%
Week 8 (February 22–29)	285	265	2.7 Minutes	93%

Notes   Calculation: AI Usage % = (Number of AI-Assisted Transactions / Total Transactions) × 100; Total Check-Ins: 2,155; Average AI Usage: 89.5%

Table 3. Detailed Guest Inquiry Analysis

Inquiry Type	January	February	Growth	Resolution
Room Information	1,250	1,340	+ 7.2%	98.5%
Service Request	985	1,055	+ 7.1%	97.8%
Booking Assistance	875	935	+ 6.9%	96.9%
Local Information	740	790	+ 6.8%	99.1%

Notes   Total Inquiries: January (3,850); February (4,120); Average Resolution Rate: 98.1%

Table 4. Email Response Analysis

Email Category	January	February	Growth	Accuracy
Booking Confirmations	720	765	+ 6.3%	99.4%
General Inquiries	680	725	+ 6.6%	98.7%
Special Request	485	520	+ 7.2%	97.9%
Feedback Responses	355	370	+ 4.2%	99.1%

Notes   Total Emails: January (2,240); February (2,380); Average Response Time: 2.5 minutes

by successful integration with the hotel's property management system. In February, performance improvements continued. Week 5 saw a 91% AI adoption rate (244 of 268 check-ins) and a processing time of 2.8 minutes, while Week 6 improved to 92% usage (250 of 272 check-ins), maintaining the same processing time. The system reached peak efficiency in Week 7 with 93% AI utilization (260 of 280 check-ins) and an average processing time of 2.7 minutes, a level sustained through Week 8 (265 of 285 check-ins). Overall, the two-month implementation processed 2,155 check-ins, with AI usage progressively increasing from 82% to 93%. Average check-in times decreased from 3.3 to 2.7 minutes, underscoring the system's maturity and the staff's effective adaptation. This improvement highlights significant gains in operational efficiency, marking a successful deployment of AI tools in front desk operations.

Table 3 provides a detailed analysis of guest inquiries during the two-month implementation of ChatGPT and Gemini, highlighting significant improvements across all categories. Room information requests emerged as the most common type of inquiry, increasing by 7.2% from 1,250 in January to 1,340 in February. These inquiries, which centred on room amenities, view options, and availability, achieved an impressive 98.5% resolution rate. This was made

possible by AI's ability to deliver comprehensive room descriptions, virtual tours, and real-time updates on availability. Service requests also experienced substantial growth, rising by 7.1% from 985 in January to 1,055 in February. This category included housekeeping needs, room service orders, and maintenance issues. The AI system's capacity to automatically direct urgent requests to the relevant departments while providing immediate acknowledgments contributed to a resolution rate of 97.8%. Similarly, booking assistance inquiries saw a 6.9% increase, growing from 875 to 935. The AI efficiently managed rate inquiries, date changes, and special accommodation requests, achieving a 96.9% resolution rate. Local information requests, which involved queries about attractions, transportation, and dining options, increased by 6.8%, from 740 to 790. This category achieved the highest resolution rate of 99.1%, thanks to the system's extensive database of local resources. Overall, the total inquiry volume rose by 7.0%, from 3,850 in January to 4,120 in February, maintaining an impressive average resolution rate of 98.1% across all categories. This success can be attributed to three key factors: the enhanced NLP capabilities of the AI systems, which enabled a better understanding of guest needs; an expanded knowledge base that addressed a wider range of scenarios; and improved integration with the hotel's property ma-

Table 5   Internal Communication Metrics

Communication Type	January	February	Growth	Efficiency
Staff Updates	585	635	+ 8.5%	96.8%
Task Assignments	490	532	+ 8.6%	97.2%
Shift Reports	380	410	+ 7.9%	98.5%
Department Memos	225	243	+ 8.0%	99.1%

Notes   Total Communications: January (1,680); February (1,820); Process Improvement: 32% time savings

nagement system, facilitating real-time updates and seamless booking modifications. These advancements underscore the effectiveness of AI in enhancing guest experiences and streamlining hotel operations.

Table 4 highlights the significant performance enhancements of the email response system during the two-month implementation period, with the total email volume increasing from 2,240 in January to 2,380 in February. Each category demonstrated notable improvements in efficiency and accuracy. Booking confirmations accounted for the largest category, growing by 6.3%, from 720 to 765 instances. These emails included comprehensive details such as room descriptions, check-in instructions, and personalized amenity recommendations. With an impressive accuracy rate of 99.4% and an average processing time of just 1.8 minutes per email, this category exemplified the system's capacity to streamline essential communication. General inquiries exhibited robust growth, rising by 6.6% from 680 to 725 emails. These inquiries covered a diverse range of topics, including hotel facilities, services, local attractions, and transportation options, all resolved with a 98.7% accuracy rate. Special requests experienced the highest growth rate, increasing by 7.2%, from 485 to 520 instances. This category often involved more complex issues, such as dietary accommodations, room preferences, and celebration arrangements. Despite the intricacies, the system maintained a commendable accuracy rate of 97.9%, supported by effective coordination with relevant departments. Feedback responses showed steady growth, rising by 4.2% from 355 to 370 emails. These responses achieved a 99.1% accuracy rate, with personalized replies addressing specific guest comments and concerns, demonstrating the system's ability to enhance guest satisfaction and engagement. Overall,

the email response system showcased exceptional adaptability and efficiency, processing increased volumes while maintaining high accuracy rates across all categories. These outcomes highlight the system's potential to elevate operational performance and guest communication quality in the hospitality sector.

Table 5 highlights the remarkable growth and efficiency improvements of the internal communication system during the two-month analysis period, with total communications increasing by 8.3% from 1,680 instances in January to 1,820 in February. Each category exhibited significant progress, contributing to the overall operational efficiency of the hotel. Staff updates constituted the largest volume of communications, rising by 8.5% from 585 to 635 instances. These updates covered essential information, including daily operational briefings, policy changes, occupancy forecasts, and VIP guest notifications. With an efficiency rate of 96.8%, the system ensured a seamless flow of information across all departments, enhancing coordination and preparedness. Task assignments showed the highest growth rate, increasing by 8.6% from 490 to 532 instances. This category benefited from the system's ability to distribute, track, and prioritize tasks across key teams, including housekeeping, maintenance, food and beverage, and the front office. Automated follow-ups and completion confirmations contributed to an impressive 97.2% efficiency rate, streamlining task management. Shift reports demonstrated steady growth, rising by 7.9% from 380 to 410 instances. These reports, which provided detailed handover information, pending tasks, and critical alerts, achieved a commendable efficiency rate of 98.5%, facilitating smooth transitions between shifts and minimizing operational disruptions. Department memos, though smaller in volume, experienced consistent growth,

Table 6   Document Processing Metrics

Document Type	January	February	Growth	Processing
Guest IDs	285	295	+ 3.5%	12 sec/doc
Registration Forms	265	275	+ 3.8%	15 sec/doc
Invoice Processing	205	215	+ 4.9%	18 sec/doc
Report Generation	135	140	+ 3.7%	25 sec/doc

Notes   Total Documents: January (890); February (925); Accuracy Rate: 99.2%

Table 7   Translation Service Analytics

Document Type	January	February	Growth	Accuracy
Guest Communications	165	180	+ 9.1%	98.7%
Documents	120	130	+ 8.3%	99.1%
Signage	85	90	+ 5.9%	99.8%
Menu Items	55	60	+ 9.1%	99.4%

Notes   Total Translations: January (425); February (460); Languages Supported: 28; Average Translation Time: 1.8 seconds per request

increasing by 8.0% from 225 to 243 instances. This category achieved the highest efficiency rate of 99.1%, reflecting the system's effectiveness in coordinating cross-departmental activities, including preparations for special events and handling inter-departmental tasks. The internal communication system's overall improvements underscore its vital role in enhancing operational workflows and fostering a well-informed and collaborative work environment. These advancements reflect the system's capacity to support the hotel's dynamic needs while maintaining high efficiency and accuracy rates.

Table 6 highlights the significant efficiency advancements achieved by the document processing system during the two-month evaluation period, with the total document volume increasing by 3.9%, from 890 in January to 925 in February. Each category demonstrated substantial improvements in speed and accuracy, underscoring the system's effectiveness in streamlining administrative tasks. Guest ID processing emerged as the most frequent category, growing by 3.5% from 285 to 295 instances. The system's advanced scanning and verification capabilities facilitated rapid authentication of diverse identification documents, including passports, national IDs, and driver's licenses. With an average processing time of just 12 seconds

per document and a 99.6% accuracy rate, this category set a benchmark for efficiency. Registration form processing experienced a 3.8% increase, rising from 265 to 275 instances. The system's ability to handle both digital and scanned paper forms reduced average processing time to 15 seconds per document—a remarkable 75% improvement compared to traditional manual methods. This efficiency allowed staff to focus on enhancing guest interactions and service quality. These improvements in the document processing system demonstrate its pivotal role in reducing administrative burdens, ensuring data accuracy, and expediting front desk operations. The system's high-speed processing and integration capabilities contributed significantly to enhancing the overall guest experience and operational productivity.

Table 7 presents the outstanding performance and growth of the translation service over the two-month analysis period, with significant improvements across all categories. The service efficiently managed a total volume increase from 425 to 460 instances, reflecting enhanced operational capacity and accuracy. Guest communications emerged as the dominant category, experiencing a notable 9.1% growth, from 165 to 180 instances. This category, which primarily dealt with check-in/check-out instructions, service requests,

Table 8. Monthly Guest Satisfaction Scores

Metric	January	February	Change
Overall Satisfaction	4.6/5	4.8/5	+ 4.3%
Staff Responsiveness	4.7/5	4.8/5	+ 2.1%
Problem Resolution	4.5/5	4.7/5	+ 4.4%
Communication Clarity	4.8/5	4.9/5	+ 2.1%

Note   Total Surveys Collected: January (425); February (468)

facility inquiries, and emergency communications, maintained an impressive 98.7% accuracy rate. The system processed these requests at an average time of 1.8 seconds per communication, ensuring timely and efficient responses to guest needs. Document translations also demonstrated substantial growth, rising by 8.3% from 120 to 130 instances. These translations, which encompassed essential materials such as registration forms, hotel policies, and service agreements, achieved a 99.1% accuracy rate. The system processed these documents at an average rate of 2.5 seconds per page, seamlessly handling multiple language pairs simultaneously. Signage translations, while showing more modest growth, increased by 5.9%, from 85 to 90 instances. This category achieved the highest accuracy rate of 99.8%, covering crucial translations for directional signs, safety instructions, and facility information in 28 languages. The system's precision in translating these signs ensure clear communication and guest safety. Menu item translations showed strong growth, rising by 9.1% from 55 to 60 instances. These translations, which handled daily menu updates, special dietary information, and culturally adapted culinary descriptions, maintained a 99.4% accuracy rate, ensuring that guests received accurate and relevant food information in their preferred language. These results highlight the translation service's key role in enhancing communication efficiency and service quality, ensuring that guests receive clear, accurate information across various categories, and facilitating a seamless multilingual experience.

Table 8 presents a comprehensive guest satisfaction analysis, showing significant improvements across all measured metrics during the two-month study period. Data were collected from a robust sample of 425 surveys in January, which increased to 468 in Febru-

ary, reflecting enhanced guest engagement. Overall satisfaction saw the most substantial improvement, rising from 4.6/5 to 4.8/5, a 4.3% increase. This improvement was driven by higher ratings for room quality (4.7 to 4.8), service delivery (4.5 to 4.7), and amenity satisfaction (4.6 to 4.8). Guests expressed greater satisfaction with the hotel's offerings, which can be attributed to both enhanced AI integration and improved operational efficiencies. Staff responsiveness also demonstrated steady growth, increasing from 4.7/5 to 4.8/5 (2.1% improvement). This was linked to improvements in check-in speed, which decreased from 3.2 to 2.8 minutes, and request handling time, which reduced from 8.5 to 7.2 minutes. The streamlined processes enabled staff to respond more quickly to guest needs, contributing to the higher satisfaction scores. Problem resolution metrics showed significant progress, improving from 4.5/5 to 4.7/5, a 4.4% increase. Notably, first-contact resolution rates increased from 85% to 92%, and the average resolution time decreased from 15 to 12 minutes, highlighting the efficiency of the AI-enhanced problem-solving process. Communication clarity received the highest scores, advancing from 4.8/5 to 4.9/5, marking a 2.1% improvement. This was supported by enhanced language accuracy (98% to 99%) and information completeness (96% to 98%), ensuring that guests received clear and accurate information, further enhancing their experience. Demographic analysis of survey respondents showed a balanced representation, with business travellers comprising the largest segment (45% in January, increasing to 48% in February), followed by leisure guests (35% in January, decreasing to 32%), and group bookings maintaining a steady 20% share. This data provided insights into guest preferences and needs, enabling more targeted service improvements. The

overall improvements were attributed to better AI integration, enhanced staff training, streamlined processes, and superior service quality management. These efforts resulted in more personalized and consistent guest experiences. In addition, the survey participation rate increased from 68% to 75%, indicating guests' growing satisfaction with the hotel's feedback systems and the improvements made in service delivery.

Implementation and Impact of ChatGPT and Gemini on Hotel Operations

The in-depth interview with the hotel owner revealed several significant insights regarding the implementation and impact of ChatGPT and Gemini on hotel operations. The qualitative analysis highlighted three main themes: operational efficiency improvements, enhanced guest experience, and staff adaptation to AI technology. In terms of operational efficiency, the hotel owner reported substantial improvements in daily workflows following the AI implementation. The integration of ChatGPT and Gemini significantly streamlined front desk operations, with the most notable impact observed in check-in processes. The owner emphasized that the AI systems effectively handled routine inquiries and documentation, allowing staff to focus more on personalized guest interactions. This shift in task distribution led to more efficient resource allocation and improved service delivery across all departments. The enhancement of guest experience emerged as another crucial theme from the interview. The hotel owner noted that the AI tools' ability to provide instant, accurate responses to guest inquiries in multiple languages significantly improved guest satisfaction. The systems' capability to handle various request types, from room information to local attraction recommendations, ensured consistent service quality regardless of time or staff availability. The owner particularly highlighted the positive guest feedback regarding the quick response times and accurate information provision, which contributed to higher guest satisfaction scores. Staff adaptation to the AI technology presented both challenges and opportunities. Initially, some staff members showed hesitation toward the new systems, but the owner described a successful transition through comprehensive

training programmes and gradual implementation. The interview revealed that staff members ultimately embraced the technology as they witnessed its benefits in reducing routine tasks and enabling them to provide more personalized service. The owner emphasized that the AI tools served as supportive resources rather than replacements for human staff, leading to improved job satisfaction and more efficient team collaboration. The interview also uncovered valuable insights regarding operational decision-making and strategic planning. The hotel owner reported that the AI systems provided detailed analytics and performance metrics, enabling more informed management decisions. This data-driven approach helped optimize resource allocation, staffing levels, and service delivery strategies. The owner specifically noted how the AI tools' ability to analyse patterns in guest preferences and behaviour contributed to more effective operational planning and service customization. These qualitative findings complemented the quantitative data by providing context and deeper understanding of the AI implementation's impact on hotel operations. The hotel owner's perspectives offered valuable insights into the practical challenges and benefits of integrating AI technology in the hospitality sector, while highlighting the importance of balanced implementation that enhances rather than replaces human service elements.

Discussion

The implementation of ChatGPT and Gemini in a four-star hotel in Ao Nang has demonstrated significant operational improvements and enhanced guest experiences across multiple dimensions. The findings highlight several key themes that warrant further discussion: operational efficiency gains, enhanced guest satisfaction, multilingual capabilities, and staff adaptation to AI technology. The substantial improvement in operational efficiency is particularly noteworthy. The reduction in check-in processing times from 3.3 to 2.7 minutes, coupled with an increase in AI usage from 82% to 93%, indicates successful system integration and staff adoption. This efficiency gain aligns with previous research by Bulchand-Gidumal et al. (2023) and Gajić et al. (2024), which emphasizes AI's potenti-

al to streamline hospitality operations. The progressive improvement in processing times throughout the study period suggests a learning curve effect, where both staff and systems became more efficient with increased usage and familiarity.

The multilingual capabilities of AI systems have proven especially valuable, with translation services handling 28 languages at an accuracy rate of 98.7%. This finding supports Kusumanegara et al.'s (2024) research on AI's role in breaking down language barriers in tourism. The ability to provide instant, accurate translations across various document types and communications has significantly enhanced the hotel's capacity to serve international guests effectively. The document processing metrics, showing 99.2% accuracy across various document types, demonstrate the systems' reliability in handling critical administrative tasks. This high accuracy rate, combined with processing times as low as 12 seconds per document, represents a significant improvement over traditional manual processing methods. These findings support Anwar et al.'s (2024) research on digital transformation in hospitality, highlighting the potential for AI to dramatically improve operational efficiency. Internal communication improvements, evidenced by a 32% time savings and high efficiency rates across all communication types, indicate enhanced organizational coordination. The system's ability to manage various communication categories, from staff updates to department memos, with efficiency rates above 96%, suggests that AI can effectively support complex organizational communication needs, as proposed by Fahad et al. (2024) and Kumar et al. (2024).

Staff adaptation to AI technology revealed an interesting pattern. Initial hesitation gradually gave way to widespread acceptance as employees witnessed the systems' benefits in reducing routine tasks and enabling more personalized guest interactions. This transition aligns with Singh and Singh's (2024) observations that AI empowers hotel staff rather than replacing them. The successful integration led to improved job satisfaction and more efficient team collaboration, suggesting that proper implementation strategies can overcome initial resistance to technological change. Although the study acknowledges initial resistance

among employees to AI integration, further exploration of their specific concerns could provide deeper insights into the challenges faced during implementation. Some staff may have experienced difficulties in learning AI tools, particularly if they lacked prior experience with digital systems or felt overwhelmed by the transition from traditional service methods to AI-assisted operations. Scepticism regarding AI's ability to handle guest interactions effectively may have also contributed to hesitation, as employees could have questioned whether AI could adequately address complex guest needs or provide the same level of personalized service. While the study notes that comprehensive training and gradual implementation helped staff adapt, it remains unclear whether these programmes were entirely sufficient to alleviate concerns or if certain employees continued to struggle with AI usage. Buhalis et al. (2024) and M'hamed and Idrissi (2024) suggest that AI adoption in hospitality requires continuous training and ongoing support to ensure seamless integration and sustained employee confidence. Moreover, Kwong et al. (2024) and Sharma et al. (2025) highlight the importance of incorporating AI ethics training into hotel programmes to ensure that staff understand the ethical implications of AI use, particularly in guest interactions and data handling. Future research could explore long-term staff adaptation, the effectiveness of different training models, and the role of managerial support in fostering AI acceptance within the hospitality workforce.

In addition, guest satisfaction metrics demonstrated remarkable improvement, with overall satisfaction increasing from 4.6 to 4.8 out of 5. This enhancement can be attributed to faster response times and more accurate service delivery, supporting Rather's (2024) findings on AI's positive impact on guest experiences. The particularly high scores in communication clarity (4.9/5) demonstrate the AI systems' effectiveness in providing consistent, accurate information across multiple languages, addressing a critical need in international tourism destinations. While the study highlights a significant increase in guest satisfaction following the implementation of ChatGPT and Gemini, it is important to consider potential concerns regarding AI-driven interactions. One possible drawback is that

AI-generated responses, despite their efficiency and accuracy, may sometimes feel impersonal or lack the warmth of human interaction—a critical component of hospitality service. Additionally, AI systems, though highly advanced, are not infallible and may occasionally misinterpret guest requests or provide responses that do not fully address a guest's specific needs, leading to frustration. Some guests may also prefer human interaction over AI-driven assistance, particularly for complex or emotionally sensitive requests where empathy and personalized service are essential, in line with Inavolu (2024). Although the study does not report any significant guest complaints related to AI interactions, this absence of recorded dissatisfaction may be considered a limitation. Future research could address this gap by conducting detailed guest feedback analyses to assess whether AI responses meet guest expectations in both accuracy and service quality, ensuring that AI implementation enhances rather than detracts from the overall hospitality experience.

Furthermore, the results raise important considerations for industry practitioners. The successful implementation of AI systems requires careful attention to staff training, system integration, and change management strategies. The gradual improvement in performance metrics suggests that hotels should anticipate an adjustment period when adopting similar systems and plan accordingly. Additionally, the findings indicate that AI should be viewed as a complementary tool rather than a replacement for human service elements. The highest guest satisfaction scores were achieved through a combination of AI efficiency and enhanced human interaction, supporting Zahidi et al.'s (2024) assertion that AI should augment rather than replace human service in hospitality settings.

Conclusion

This research provides compelling empirical evidence of the transformative impact of AI technologies, specifically ChatGPT and Gemini, in the hospitality industry through a detailed case study at a 4-star hotel in Ao Nang, Krabi in Thailand. The implementation demonstrated significant operational improvements, particularly in check-in processing efficiency and AI system adoption throughout the study period. In addition, guest satisfaction metrics showed notable enhancements across all dimensions, with the most pronounced improvements in overall satisfaction and communication clarity. The systems' multilingual capabilities proved highly valuable, supporting multiple languages with high accuracy and facilitating seamless communication with international guests. Moreover, document processing efficiency saw substantial gains, while internal communications benefited from notable time savings across all departments. The successful implementation offered critical insights into change management and staff adaptation. Initial hesitation among staff was overcome through comprehensive training and a phased implementation approach, resulting in improved job satisfaction and more effective team collaboration. These findings underscore that, when properly implemented, AI technologies can significantly enhance both operational efficiency and guest satisfaction, fostering customer loyalty and driving high business performance while complementing, rather than replacing, human service elements.

Research Implications

From a theoretical perspective, this research advances our understanding of AI integration in hospitality management. The findings validate and extend existing theories about technological adoption in service industries, particularly regarding the relationship between AI implementation and service quality enhancement. The study provides empirical evidence supporting theoretical frameworks on the role of AI in improving operational efficiency while maintaining service quality. Additionally, the research contributes to theoretical discourse on change management in technology adoption, demonstrating how appropriate training and gradual implementation can overcome initial resistance to technological change. From a practical standpoint, this research offers valuable insights for hospitality managers and practitioners. The documented improvements in operational efficiency and guest satisfaction present a compelling business case for AI adoption. The study provides a practical blueprint for implementation, highlighting the importance of comprehensive staff training, gradual system integration, and careful attention to chan-

ge management strategies. The success in enhancing both operational efficiency and guest satisfaction demonstrates the potential benefits for hotels willing to embrace AI technology.

Limitations and Suggestions for Future Research

This study has limitations that should be considered when interpreting the results. The relatively short study period, while providing valuable insights, may not capture long-term trends or seasonal variations in hotel operations and guest behaviour. The focus on a single four-star hotel in Ao Nang limits the generalizability of results to different hotel categories or geographical locations. Additionally, the study period coincided with a period of increasing occupancy rates, which may have influenced the observed improvements in operational metrics. Future research should address these limitations through several approaches. Long-term longitudinal studies across diverse hotel categories would provide more comprehensive insights into the sustained impact of AI implementation. Research comparing AI adoption across different geographical locations and market segments would help understand how cultural and market factors influence implementation success. Additionally, studies focusing on specific aspects of AI implementation, such as staff training methodologies or system integration strategies, would provide valuable practical guidance for the industry. Investigation into the optimal balance between AI automation and human service elements would benefit from further research, particularly in different cultural contexts and service categories. Research into the impact of AI implementation on staff retention, job satisfaction, and career development would provide valuable insights for human resource management in the hospitality industry. These suggested research directions would contribute to a more comprehensive understanding of AI's role in hospitality management and provide practical guidance for industry stakeholders as they navigate the ongoing digital transformation of the sector.

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