A Systematic Literature Review on Agentic AI Insights in Hospitality Industry

Saranya Arunkumar

Samy Project Hub Hyderabad, Hyderabad, India

*samyprojecthub@gmail.com

Abstract

Agent AI is a revolutionary approach that uses autonomous agents to solve difficult problems in decentralized environments, either alone or in cooperation. The development of Agent AI and its application are expanding at an alarming rate. Agent AI changes the way the people avail themselves of services. This is transforming the way the tourist receives hospitality, engages with services, and makes decisions. Studies taking on Agent AI on the adoption of the hospitality industry remain scattered. The present study focuses on addressing research gaps and providing an in-depth understanding of Agent AI in the field of the hospitality sector. The main purpose is to present an overview and synthesis of the body of knowledge currently available on Agent AI and identify the most pertinent research in the area. A systematic literature review is performed on documents obtained from the Scopus databases. The articles will be selected based on PRISMA methodology. This will consider the studies published between 2005 and 2025.

The primary search terms for this study include"Agentic" or "Autonomous" or "Self-directed" or "Independent" and "Artificial Intelligence" or "AI" or "Machine Intelligence" or "Intelligent Systems" and "Hotel" or "Hospitality" industry. This search term is used to search the chosen publication through the title, abstract, and keywords in the selected database. The focal point of the study is to find out the most influential aspects of Agent AI in hospital literature in terms of authors, articles, journals, and institutions. Also, the study advances the knowledge on the application of Agent AI and finds out the trends and future research opportunities in the sector.

Keywords: Agentic AI, Agent based modelling, systematic literature review, Hotel industry, and hospitality industry

Introduction

The hospitality industry is one of the fastest and largest growing industries across the world (Tuomi & Ascenção, 2023). In the recent days, this industry has been looking for new avenues to grab a wider audience to gain competitive advantage (Wong et al., 2023). Technological advancement is one of the avenues in which AI has been used to delegate the tasks to machines (Tuomi & Ascenção, 2023). AI is transforming the hospitality industry (Gursoy, 2025; Kim et al., 2025) due to the growing use of machine learning, robotics, natural language processing (Wang et al., 2025), generative AI (Wong et al., 2023), automated booking systems, chatbot and AI-powered concierge services (Wang et al., 2025), generative AI (Wong et al., 2023), virtual assistants, automated hotel management systems, predictive analytics (Jerez-Jerez, 2025), service robots, smart assistants, and autonomous systems (Gursoy, 2025) to modernize the operations of the industry (Gursoy, 2025). These technologies are playing a key role in enhancing and speeding up all the intermediate interactions from the reservation to the checkout. Utilizing the technologies offers a smooth and customized experience to the customers (Aggarwal & Mittal, 2024). This enhances operations & efficiency and improves customer experience, customer engagement, and service delivery in the industry (Wang et al., 2025). As a result, hospitality companies think about how to leverage, interact, and use technology to remain competitive (Buhalis et al., n.d.) in the market.

One of the new levels of advancement in AI in modern organizations is Agentic AI (Hosseini & Seilani, 2025; Pati, 2025), which is a multi-agent system that does more than simply respond to commands; it can also choose tools, set subgoals, and carry out multistep actions to accomplish user goals with limited supervision (Bandi et al., 2025). Agentic AI can be described as an autonomous AI that can set objectives and decide and act on its own to accomplish tasks or reach goals without human assistance (Pati, 2025). These agents could collaborate with the people, perform tasks, boost output, and interact with the people in situations where their presence might be hazardous or undesirable (Acharya et al., 2025). This is more important as it addresses the needs for speed, customer orientation, and efficiency. This is playing a key role in the hospitality industry. For example, when the task is given, "Plan a 3-day trip to Chicago under USD 1500." This task is classified into smaller

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tasks like booking flights, booking reservations, and even creating itineraries. Find out the real-time sources, compare options, and create a plan that only requests confirmation at key steps. This action represents that Agentic AI goes beyond traditional chatbots that plan, act, and verify results within the loop (Bandi et al., 2025). Thus, agentic AI transforms from reactive systems to self-governing, goal-oriented entities with the ability to learn, adapt dynamically, and make choices on their own (Murugesan, 2025) in a dynamic environment.

Studies have shown that an important advancement in AI is represented by agentic AI systems (Awasthi, 2025; Faiz Abror et al., n.d.; Garg, 2025). This allows systems to autonomously perceive, act, and make decisions in a complex environment. The characteristics of agentic AI were listed as follows: it could have the ability to function independently or with minimal human oversight (Awasthi, 2025; Murugesan, 2025; Pati, 2025; Raheem & Hossain, 2025); continuous performance improvement (Awasthi, 2025; Murugesan, 2025; Pati, 2025; Raheem & Hossain, 2025); intentionality (Awasthi, 2025); goal-oriented (Pati, 2025); and advanced language comprehension that allows it to interpret human intent, analyze complex issues, learn from user interactions about the issues, refine its strategies based on issues, clarify expectations, engage in discussion, generate solutions, and enhance decision-making (Murugesan, 2025). These agents are designed to meet business objectives, perceive and adapt to the environment, improve their performance over time, and enhance business processes through facilitating and communicating with different agents (Hosseini & Seilani, 2025).

There have been growing studies in the application of agentic AI in different industries, including healthcare and education (Awasthi, 2025; Bandi et al., 2025; Garg, 2025; Murugesan, 2025; Patel, n.d.; Raheem & Hossain, 2025). Finance(Bandi et al., 2025; Garg, 2025; Joshi, 2025; Murugesan, 2025; Patel, n.d.; Pati, 2025), drones, vehicle, collaborative robots, customer support, cybersecurity, supply chain(Murugesan, 2025; Patel, n.d.; Pati, 2025), environmental monitoring (Raheem & Hossain, 2025), marketing &sales, software(Joshi, 2025), agentic frameworks, human AI collaboration, creative industries, autonomous(Garg, 2025), enterprise applications, public administration, multiagent simulations(Patel, n.d.), business operation, HR, cybersecurity(Murugesan, 2025), retail, public administration, manufacturing, scientific discovery, travel and tourism, multidomain, smart cities &energy, telecommunication &

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network, military and security transportation(Bandi et al., 2025). Previous studies have highlighted that agentic AI would act as virtual agents, AI-powered managers that have the potential to undertake complex processes, offer real-time solutions (Bandi et al., 2025), enhance human abilities, and redistribute a more responsive and equitable framework for collaboration (Patel, n.d.). Agentic AI is enhancing efficiency, scalability, streamlining operations, enhancing productivity, and improving decision-making (Faiz Abror et al., n.d.; Raheem & Hossain, 2025). Most of the studies give an emphasis to show the applications of agentic AI in retail, healthcare, and finance. These agents enhance the process by up to 40-60% in business operations (Joshi, 2025), reduce overstocking costs by up to 25% and enhance sales forecasts by 85% in the retail industry, reduce fraudulent transactions by 40% in finance, and reduce patients' processing time by 50% in the healthcare sector (Hosseini & Seilani, 2025). Research on the application of agentic AI in the field of the hospitality industry is scarce. It is imperative to explore the applications of agentic AI in the hospitality domain.

Reviewing the research on agentic AI reveals that a small number of studies have performed a systematic literature review to conceptually understand the role, opportunities, and challenges of agentic AI in a business context (Bandi et al., 2025; Faiz Abror et al., n.d.). (Bandi et al., 2025) conducted a systematic literature review to understand the framework and architectures relating to Agentic AI by investigating 143 research articles published in different academic databases such as Library Search, ACM Digital Library, Semantic Scholar, and Google Scholar. (Faiz Abror et al., n.d.) covered only a ScienceDirect database to implement systematic literature analysis on agentic AI between 2020 and 2025. Conceptually, the key components of agentic AI were listed as follows: perception, planning, execution, memory, reflection, orchestration, and interaction (Bandi et al., 2025). According to Bandi et al. (2025) findings, some of the LLMs could be used as communicators, orchestrators, and reasoners, which is the reason for differences in the control loop and orchestration style of agentic AI. Faiz Abror et al. (n.d.) have found that the utilization of agentic AI as virtual agents, AI-powered managers, and autonomous service systems significantly enhances operational effectiveness, innovation, and strategic decision-making. As observed from these studies, give an emphasis to business context. There is a lack of resources available on how agentic AI is

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offering benefits to specific industries. The present study differs from previous reviews on Agentic AI (Bandi et al., 2025; Faiz Abror et al., n.d.) by focusing on a single database. The importance of agentic AI, specifically in the Scopus database, is necessary for this field. There is a lack of studies available on which journals and countries are contributing more in the field of agentic AI, which is also nascent. The research has made a concerted effort to address the issues. The present study will analyze the agentic AI-related articles published in the Scopus database.

The aim of the study is to present an overview and synthesis of the body of knowledge currently available on Agent AI and identify the most pertinent research in the area.

The objective of the study is to carry out a comprehensive overview of agentic AI research, focusing especially on the hospitality industry. Also, this helps to explore the applications of agentic AI in the hospitality industry.

The contribution of the study is determining which countries and sources made the high contributions in the development of agentic AI research. This also contributes by finding out the trending topics in agentic AI research and finding out the most cited journals in the field. Moreover, content analysis has been used to find out in what ways agentic AI has been used in the hospitality industry, which has been investigated thoroughly.

The articles are organized as the following section. The research methodology is presented in the subsequent section. A systematic analysis of the papers, results, and key findings is presented. This finishes with a conclusion, limitations, and scope for further research.

Material and Methods

The present study adopts a systematic literature review. This is highly helpful in exploring new and emerging trends through comprehensive analysis of research literature on agentic AI, notably in the field of the hospitality industry. The present study adheres to PRISMA, which is a standard methodology that ensures rigor, objectivity, and transparency in synthesizing previous literature in a well-organized manner. This study has used the Scopus database to maintain the academic quality of the research. The search query used was TITLE-ABS KEY "Agentic" OR "Autonomous" OR "Self-directed" OR "Independent" AND "Artificial Intelligence" OR "AI" OR "Machine Intelligence" OR "Intelligent systems" AND hotel OR

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hospitality industry. These keywords assist in finding out the specific articles that focus on agentic AI and the hospitality industry.

The inclusive criteria for selecting the articles were as follows:

1. Search terms including "Agentic" OR "Autonomous" OR "Self-directed" OR "Independent" AND "Artificial Intelligence" OR "AI" OR "Machine Intelligence" OR "Intelligent systems" AND hotel OR hospitality industry included in the title or abstract or keywords.

2. Time range for the terms between 2015 and 2025.

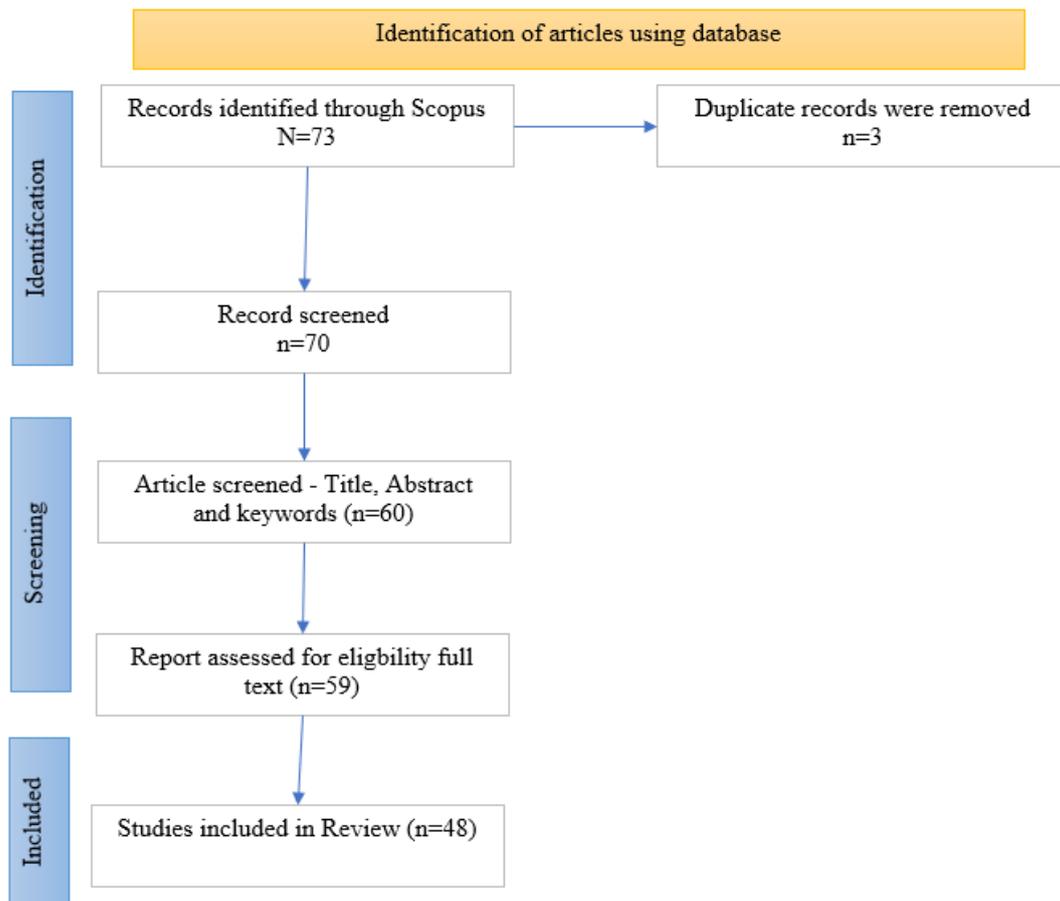3. Document type: Articles & conference paper

4. Language: English

Figure 1. Flowchart

Exclusive criteria for rejecting the articles were as follows:

1. Document types relating to early access, review articles, editorial materials, meeting abstracts, book reviews, and retracted publications.

2. Articles published other than in 2005 and 2025 were not selected.

3. Other languages were excluded.

4. Studies that are not related to keywords

Initially, a sample of 73 articles was retrieved based on title, abstract, and keywords. After carefully examining 73 articles, 48 were determined to be suitable for the selection criteria. A total of 48 studies were included in the final selection, which comprised articles (25) and conference papers (23). Thus, the total number of articles used in the study was 48 to examine the application of agentic AI in the hospitality industry.

Results

This section examines how the study of Agentic AI in hospital industry has progressed between 2005 and 2025. This section analyses the articles that offer high quality insights and outstanding output with insightful suggestions for the future have been taken into consideration. The results are presented in Figures.

Summary statistics: Figure 2 shows the distribution of data for the field "Agentic AI in hospital industry" from 2005 and 2025. A total of 48 documents were retrieved from 31 sources that contributes articles (25) and conference papers (23). The development of publications shows an annual growth rate of 10.96%. On contrary, international co-authorship contributed 33.33% with an average of 9.94 co-authors per document. The average document age of 3.85 years and an article citation rate is 36.77 per document. This indicates that there is a speedy growth of scholarly articles in the field of Agentic AI.

Figure 2. Summary statistics

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Performance Analysis: Figure 3 presents the annual number of articles published per year in Agentic AI in the hospital industry from 2005 to 2025. The researcher has classified the time period into three stages. Stage 1: From 2005 to 2012, publications were low, not exceeding 2 articles annually. This indicates that there was a limited academic interest in the field. Stage 2: Between 2013 and 2019.The total number of publications made in the time range was 8. This is quite an improvement over stage 1. Notably, two articles were published in 2018, and the rest of the other years have published one article. Stage 3: Between 2020 and 2025. Interestingly, the number of articles published during the period was 38, showing that agentic AI research has increased the interest of academics across the world. The figure shows the spike in 2020, 2022, and 2025.
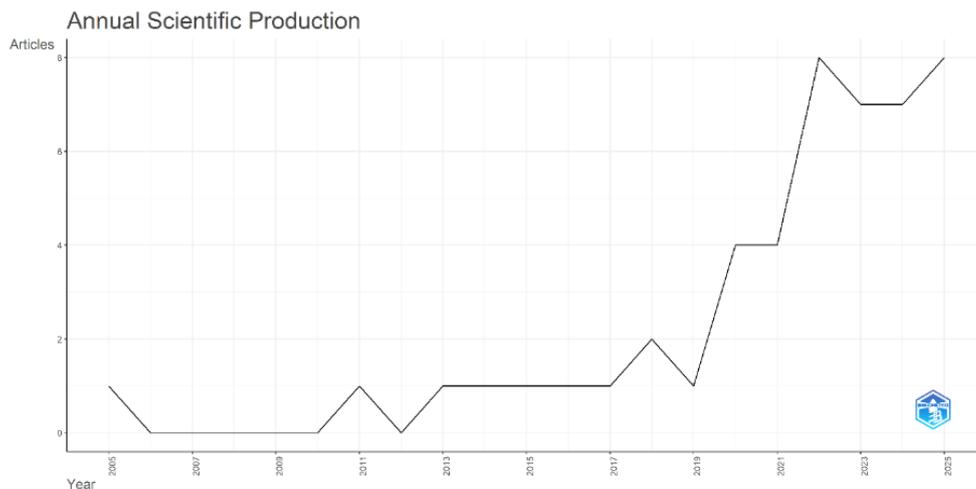

Figure 3. Annual scientific production

Performance of Journals: Figure 4 shows that the most significant number of articles relates to agentic AI in the hospital industry, highlighting its significance in the field. The majority of the articles relating to the field were published in conference papers (29%), followed by the "International Journal of Hospitality Management," which published 3 articles (6%), and the AIP Conference Proceedings and the Journal of Hospitality and Tourism Management, with 2 articles (4%).
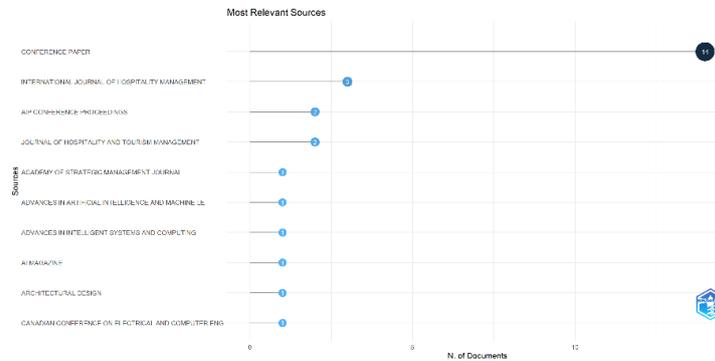
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Figure 4. Most relevant sources

Geographic distribution: Figure 5 shows the geographical distribution of articles in the field. The selected articles researched in the field of Agentic AI in hospitality industry in 25 unique countries. This lists the countries in Asia, America, Europe, and Oceania. The highest number of articles studied Agentic AI in hospitality industry in Asia. The number of studies per country in Asia was as follows: thirty-six (26%) in China, fourteen (10%) in India, six (4%) in Sri Lanka, four (3%) in Jordan, three each (2%) in Indonesia, Japan, and Malaysia, two each (1.41%) in Pakistan, Philippines, and Saudi Arabia and one (1%) in Iran. In addition, America holds the second place with USA (13%) and Canada (4%) and Europe hold the third place with UK (8%), Netherland, Italy and Turkey (4%), Spain (2%) and 1% each in Finland, Belgium, Germany, Ireland, and Norway. In Oceania, three articles studied in New Zealand (2%) and Australia (1%).
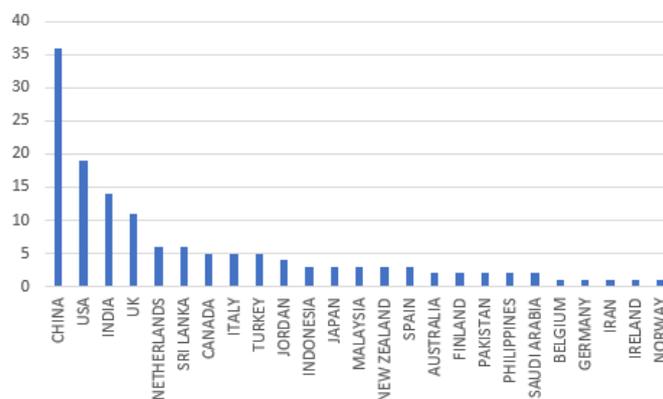

Figure 5. Geographic distribution

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Keyword Analysis: Figure 6 illustrates the keywords in articles linked to Agentic AI to discover the most frequently used keywords. According to word cloud, the terms with the most significant rise in occurrence were "Artificial Intelligence", "Intelligence robots", "learning systems," "robots," "machine learning." In addition, Figure presents the six leading keywords yearly to highlight the trendy topics. The results showed that Agentic AI is associated with intelligent robots (2018-2021). Researchers focus shifted to Artificial intelligence in (2019-2024). The concept of "Machine learning: and "robotics" attracted the researcher's interest in the following years (2021-2022). Recent efforts have concentrated more on "hotels" and "tourism" from the tourism perspective. As a result, an increasing body of literature has focused on "Artificial intelligence" in Agentic AI in hospitality industry.
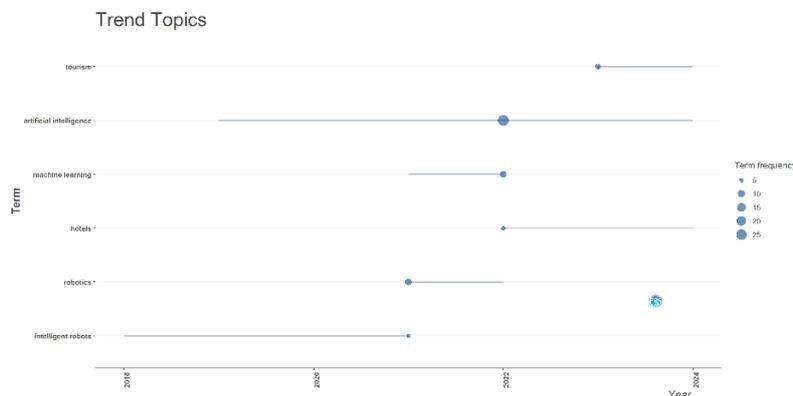

Figure 6. World cloud

Figure 7. Trend topics

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Application of Agentic AI and its benefits in the hospitality industry: Agentic AI has been used in the form of autonomous smart hotel systems, unmanned hotel systems, generative AI applications, and AI-powered voice assistant technology (Aggarwal & Mittal, 2024; Fan et al., 2022; Kumar Tyagi et al., 2022; Wong et al., 2023).
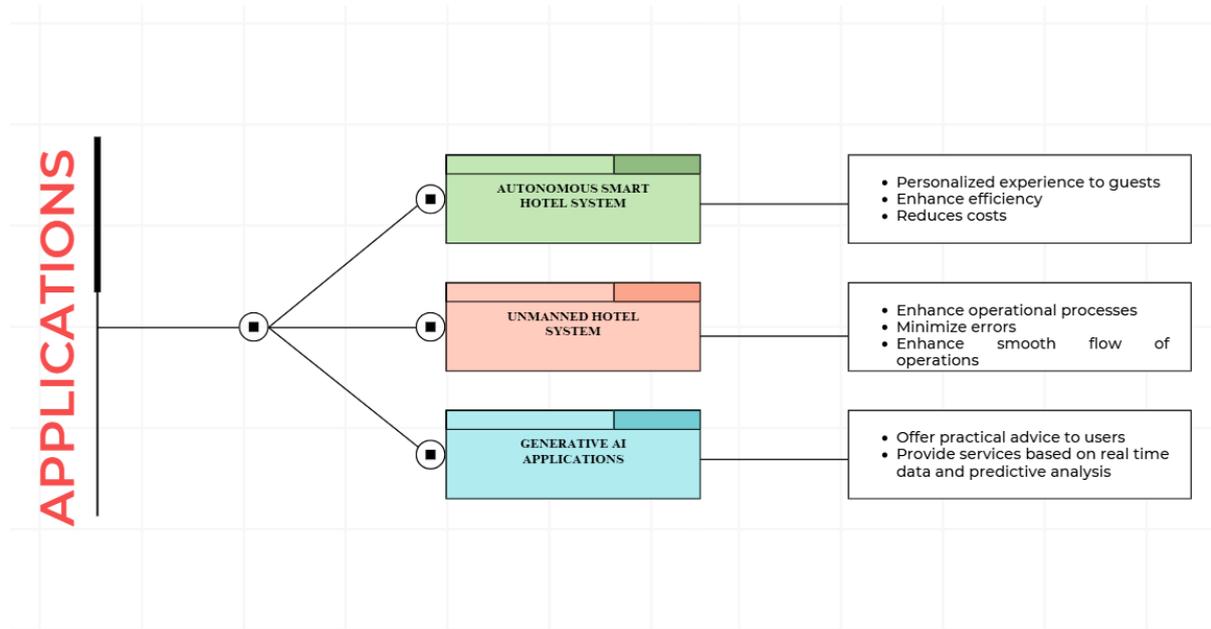

Figure 8. Application of Agentic AI and its benefits in the hospitality industry

One of the foremost technological innovations is unmanned smart hotels. Unmanned smart hotels are popular among business travelers. These hotels have utilized voice-controlled AI assistants, AI-based concierge services, smart room control systems, and robotic room services. This allows the guests to do self-check-in, receive service through robots, and control their rooms with the technology. Such services offer a personalized and unique experience to guests. As a result, unmanned smart hotels enhance operational efficiency and diminish costs (Çeltek, 2024). The second innovation is the Decentralized Autonomous and Smart Hotel System (DASH). This technology is a pay-per-use model that integrates disruptive technologies (AI, blockchain, and the Internet of Things) to track the usage of amenities and utilities for patrons. This technology offers an innovative and automated hospitality experience to guests (Aggarwal & Mittal, 2024). Utilizing DASH in hotels enhances different operational processes (room assignment, housekeeping schedules & check-ins), automates the tasks,

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minimizes errors, enhances smooth flow of operation, ensures optimal occupancy rates, prevents over shortages, and ensures the security of patron data and transactions. Reducing the risk of systemic breaches of data and conducting regular audits and privacy features and compliance checks improves confidentiality and protects patron information. The study concludes that DASH is one of the futuristic smart hotel systems with minimum human intervention and maximum autonomy and agility, resulting in an elevated guest experience at the hotels. The third technology is AI-powered voice technology that has been adopted in hotel in-room technology. This technology offers convenience and personalization of services to enhance customers (Fan et al., 2022). Fourthly, generative AI applications have been used widely in the hospitality industry. This technology helps to cater to the need of interest and demand of the users. They utilized advanced machine learning algorithms and real-time information to become a personal assistant for users. This is offering all services, including practical advice and up-to-date information, to the users. The aim of generative AI applications is to satisfy each person's needs at every step of their journey (Wong et al., 2023). Recent machine learning highlights that generational AI autonomously makes service decisions based on real-time data and predictive analysis. The success of the hospitality industry depends upon how these industries value people as an essential partner in offering intelligent and high-quality service to customers (Kumar Tyagi et al., 2022). Overall, the usage of agentic AI delivers an efficient, seamless, and high-quality experience to users.

Conclusion

This study offers a comprehensive picture of agentic AI research. The study finds that the growth in the field of agentic AI research is rising in 2025. This progression grabs the attention of researchers, scholars, and academicians for agentic AI research. The term "artificial intelligence" and the words "hotel" and "tourism" are gaining popularity in the field. As countries, China, the USA, and India contribute most to the development. This indicates that Asian countries dominate the interest in the multitude of studies being carried out in the field. Assessing studies revealed that the most forefront technologies, including unmanned smart hotel systems, autonomous and smart hotel systems, AI concierge services, and generative AI, have been widely used in the hospitality industry. This technology offers

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personalized services to users. Such personalized experience offers significant benefits to the users. This includes autonomy, agility, convenience, personalization of services, innovation, and improved operational efficiency. Thus, the study concludes that agentic AI is gradually increasing its presence in the hospitality industry.

The major limitation of the study is that the outcome has been derived on the basis of a single academic database (Scopus). Though the articles provide insights, these articles might not adequately cover the applications and benefits in the industry. There are different kinds of technologies adopted to enhance the experience, which might be missed due to not including different academic databases. Further work needs to be done on the keywords in the Emerald Insight, Web of Science, and ACM Digital Library databases to offer additional coverage for the articles. Further research in this field would be of great help to understand the applications in deeper detail, the advantages, and the efficiency of agentic AI in the hospitality industry.

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