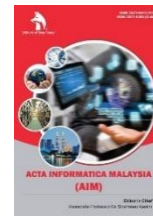




ZIBELINE INTERNATIONAL™  
P U B L I S H I N G  
ISSN: 2521-0874 (Print)  
ISSN: 2521-0505 (Online)  
CODEN: AIMCCO

# Acta Informatica Malaysia (AIM)

DOI: <http://doi.org/10.26480/aim.01.2023.24.28>



## RESEARCH ARTICLE

# ADOPTION OF ARTIFICIAL INTELLIGENCE IN THE PHILIPPINE HOTEL AND LEISURE INDUSTRY: AN ASSESSMENT

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## ARTICLE DETAILS

### Article History:

Received 26 November 2022  
Revised 06 December 2022  
Accepted 10 January 2023  
Available online 14 January 2023

## ABSTRACT

Artificial Intelligence has been a headline nowadays, it makes human work easier and faster. Organizations adopted this kind of technology to keep up with the demand of globalization and the hotel and leisure industry is amongst to integrate AI to its business model. Highly modernized hotels are more coveted to choose by customers due to their expectation of the excellent services they can be provided. This paper looks on the status of the adoption of artificial intelligence in the hotel and leisure industry in the Philippines as well as its capacity to take full advantage of the perceived benefits of the said technology in the future. It is anchored on Roger's Innovation Diffusion Theory (IDT), and it rests on the underpinning for comprehending innovation adoption and the elements that influence an individual's decision to accept a new technology. This research employed qualitative design using secondary data from research journals and articles. It focused on the relative advantage of artificial intelligence in general, efficiency, revenue enhancement, investment cost, reputation management, competitive intelligence, compatibility and complexity as the future in the hospitality, specifically in hotel and leisure industry.

## KEYWORDS

Artificial Intelligence, Hotel and Leisure, Innovation, Adoption

## 1. INTRODUCTION

With the fast changes brought about by technology, industries have to adapt to this development, including keeping up their operational strategy and business model. On the other hand, technology can enable businesses to employ economies of scale or differentiate their products which could be a source of competitive advantage. Artificial intelligence (AI) is the ability of a computer or a computer-controlled robot to accomplish tasks that would normally be performed by rational human beings. The term is frequently used to describe a project that aims to build systems with cognitive capacities akin to those of humans, such as the capacity for reasoning, deciphering meaning, generalizing, and learning from the past. Since the invention of the digital computer in the 1940s, it has been proven that computers can be programmed to perform extremely complicated jobs with ease, such as finding proof for mathematical theorems or playing chess. Although computer processing speed and memory capacity are constantly increasing, no program has yet been able to match human adaptability in broader sectors or in tasks requiring a lot of common knowledge. On the other hand, some programs have attained the performance levels of human experts and professionals in performing certain specific tasks, so artificial intelligence in this limited sense is found in applications as diverse as medical diagnosis, computer search engines, and voice or handwriting recognition (Copeland, n.d.).

Artificial intelligence is becoming increasingly significant in the hotel industry, owing to its capacity to do traditionally human tasks at any time of day. This might help hoteliers save a ton of money, reduce human error, and enable them to deliver better service. Customer service is particularly crucial in the travel industry since how hotels treat their guests can make or break them. The options for improving this element with artificial

intelligence are nearly unlimited, ranging from improved personalization to personalized recommendations. Responding to client questions fast is one of the most difficult customer service tasks for hotels, and artificial intelligence now offers another solution. Furthermore, it has the ability to assist with tasks like data analysis and can successfully "learn" and adapt to consumer interactions through data collection (Revfine, n.d.). Especially at this time of pandemic when close contact with other individuals is being controlled, the use of artificial intelligence in the implementation of business transactions has proven beneficial to public health.

According to a report released by the World Bank and the National Economic and Development Authority, rapid adoption of digital technologies can help the Philippines overcome the impact of the COVID-19 pandemic, recover from the crisis, and achieve its vision of becoming a middle-class society free of poverty (NEDA). However, the Philippines' use of digital technology is still below its potential, with the country lagging behind many of its regional neighbors. The "digital divide" between those who have access to the internet and those who do not result in unequal access to social services and life-changing economic opportunities (Ponti, 2021). Moreover, most developing economies in East Asia, including the Philippines, have underperformed when it comes to adopting and discovering new technologies because of a lack of information, weak company capacity, inadequate personnel skills, and a lack of government assistance.

Therefore, this study would seek to determine the status of the adoption of artificial intelligence in the hotel and leisure industry in the Philippines as well as its capacity to take full advantage of the perceived benefits of the said technology in the future.

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Website:  
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DOI:  
[10.26480/aim.01.2023.24.28](https://doi.org/10.26480/aim.01.2023.24.28)

## 2. THEORETICAL CONCEPT

### 2.1 Rogers' Innovation Diffusion Theory

Everett Rogers introduced his Innovation Diffusion Theory (IDT) in 1962, and it has been used frequently in case analysis since then. It lays the groundwork for comprehending innovation adoption and the elements that influence an individual's decision to accept a new technology. Rogers' theory is broad in scope, making it adaptable to a variety of situations, but it is challenging to utilize as a process model when preparing for organizational change due to the adoption of a new technology (Straub, 2009).

Rogers goes beyond the adoption process to identify five characteristics that influence whether or not an invention is adopted: relative advantage, compatibility, complexity, trialability, and observability. When compared to the alternatives, relative advantage relates to how much larger or fewer the benefits of the invention are. Any new product or procedure must be able to show that it provides a benefit. (Mazzarol and Reboud, 2017). Compatibility refers to how well an innovation fits into an existing process or workflow of a potential adopter. The more complex an idea is to learn and implement, the less likely it is to be embraced. This is due to the fact that its intricacy is seen excessive. Potential adopters are more inclined to accept innovations that they can try out and experiment with before deciding whether or not to adopt them; this is referred to as trialability. Observability arises when an invention has been embraced and disseminated widely enough within a culture system that those who had not previously considered adopting it alter their thoughts or at least contemplate it (Rogers, 2003).

### 3. STATEMENT OF THE PROBLEM

Various ways can be done in employing artificial intelligence in the Hotel and leisure industry. In many ways, technological advancements are advantageous to the sector. Guests are more acclimated to technology in a situation where the epidemic has driven digitization. The question is what function artificial intelligence (AI) technology will have in the near future. Therefore, this study will seek to look into the adoption of artificial intelligence in the Philippine hotel and leisure industry as well as its capacity to take full advantage of the perceived benefits of the said technology in the future. This would be discussed in relation to its relative advantage, compatibility and complexity.

### 4. METHODOLOGY

This research employed a qualitative design that gathered secondary data from various research articles to identify the adoption of artificial intelligence in the Philippines hotel and leisure industry specifically in relation to relative advantage, compatibility, and complexity.

### 5. DISCUSSION

Artificial intelligence is the simulation of human cognitive processes by technology, particularly computer systems. Expert systems, natural language processing, speech recognition, and machine vision are examples of AI applications (Burns et al., n.d.).

In a 2016 article, Arend Hintze, an assistant professor of integrative biology and computer science and engineering at Michigan State University, explained that AI can be divided into four categories, starting with today's task-specific intelligent systems and progressing to sentient systems that do not yet exist. The following are the categories:

Type 1: Reactive machines. These AI systems are task-specific and have no memory. Deep Blue, the IBM chess software that defeated Garry Kasparov in the 1990s, is an example. Deep Blue can recognize pieces on the chessboard and make predictions, but it can't use past experiences to influence future ones because it has no memory.

Type 2: Limited memory. Because these AI systems have memories, they can draw on prior experiences to make better decisions in the future. This is how some of the decision-making mechanisms in self-driving automobiles are built.

Type 3: Theory of mind. The term "theory of mind" is used in psychology. When it comes to AI, this means that the system will have the social intelligence to recognize and interpret emotions. This kind of AI will be capable of anticipating human behavior and determining human intentions, which is a necessary skill for AI systems to function as useful teammates on human teams.

Type 4: Self-awareness. AI systems that fall into this category have a feeling of self, which gives them awareness. Self-aware machines are aware of their own current state. This form of artificial intelligence does not yet exist.

### 5.1 Relative Advantage

To better serve customers, machine learning algorithms are being integrated into analytics and customer relationship management (CRM) platforms. Websites now include chatbots to provide clients with rapid assistance. The topic of work positions becoming automated is now being discussed by academics and IT specialists.

The hospitality industry as a fast-paced industry has adopted several technologies to cope with global challenges. Long before, hotels used ordinary keys for security using big keychains indicating their room number, then electronic locks using key cards, and nowadays, hotels are using sensor sticks to open the doors and to power up the rooms. The hospitality industry is evolving at a rapid pace, aided by technological advances in Artificial Intelligence (AI), robotics, and big data (Reis, et al., 2020). This is due to a highly competitive market, saturated technologies, guests who expect superior service, serve as a significant source of innovation, and are constantly confronted with the challenges of rising costs (Limmna, 2022). Through the use of AI-enhanced hotel and tourist operations and management systems, the hospitality sector is being transformed into an intelligent hotel and tourism sector (Ruel and Njoku, 2021).

Bisoi, Roy, and Samal, identified major impacts of AI in the hotel sector that include higher efficiency with cost savings, enhancement of revenue, investment with high return, reputation management, and competitive intelligence (Bisoi et al., 2020).

### 5.2 Higher Efficiency with Cost Savings

According to the National Grid, energy equipment consumes roughly 12% of lodging revenue. An AI-based machine can detect visitor proximity and preferences and turn on and off the equipment automatically, saving energy and improving visitor comfort. Cleaning robots, AI-based cleaning devices, and automatic scaled-down vacuum circles will keep the lodge clean while reducing the housekeeping staff's workload. AI will keep a strategic distance from hearing up stock and wastage by assessing request and fabric demand designs. It enabled supply chain management frameworks to ensure that the proper quality fabric is obtained at the right time and at reasonable costs, resulting in successful benefit execution.

### 5.3 Enhancement of Revenue

It can also advertise with thoughtful details such as a tourist's preferred daily paper, toiletries, pads, TV, bathroom setting, and room sees to keep the visitor returning. Extraordinary things provided by visitor preferences and preparing individualized benefit experiences, such as rich material, wonderful beverage menus, and extravagant automobiles for clients' requests, will generate more revenue. AI discovers the inhabitance designs for lodging regions by parsing various data sources, evaluates the impact of specific events, and recommends active estimates. AI to provide estimation approaches for maximizing occupancy levels in a few unusual situations. By continuously altering show options, AI embedded in the hotel website and booking engines can increase the conversion rate. When a potential tourist uses a booking engine to check rates and accessibility, AI notices that the rate of abandonment is higher when the rooms are shown in a different color.

The hotel and leisure industry's subsistence is commonly determined by their overall financial performance, capacity to adapt to changing environments, and how they transform and expand their services to meet the needs and expectations of the customers (Van Niel, 2016; Wikham, 2019; Limna, et al., 2021). For this reason, the hotel and leisure industry leverages to artificial intelligence and robotics (AIR) to improve customer service and experience. Nowadays, there are self-service kiosks in airports worldwide, bellbot in the restaurants, self-ordering menu in fast food chains, and even vendo machines all over the place. These technological advancements have been altered into smart tools for providing customer service, and they are being utilized to improve the customer experience (Goel et al., 2022). The opportunities for applying AI to serve in the tourism and hospitality industry are enormous, nevertheless, it depends on how the enterprises recognize its potential benefits together with the demand for it in order to decide whether it is worth contemplating (Altinay and Pondel, 2015).

#### 5.4 Investment with High Return

It provides high-quality service by agreeing to the inn's needs and channeling its funds for a good return. The AI-based framework automatically alerts and informs lodge guests of equipment and property maintenance, upgrades, and replacements. It uses data on population, criticism, and online polls, as well as self-detailed visitor information, to select the most important choices with the highest return.

#### 5.5 Reputation Management

It can automatically filter audit destinations, recordings, photos, social media platforms, blogs, and websites near the inn, allowing visitors to react quickly to any negative reviews and stay away from any open connection disaster. So, they can use branding and reputation-building techniques.

#### 5.6 Competitive Intelligence

In general, AI-based frameworks can be used by lodging associations and government agencies to design strategies, frameworks, and commercial ventures that can result in more revenue and help the lodging industry grow. AI-based frameworks can test hundreds of designs, learn, and progress results several times faster than humans can. AI can also provide critical settings for long-term extension. It also recognizes inn demand and supply in certain regions, providing a solid foundation for inn commerce expansion. Survey data, socioeconomic data, and pipeline data that establish the sequence and guidelines assist target client segments the most. AI frameworks can also be used by a significant portion of the sector to discover benefit designs for manufacturing inventive administrations and unused brands for particular client fragments.

Using digital technologies, guests or customers currently can book reservations at their fingertips in no time. In 2008 when Nathan Blecharczyk and his roommate Joe Gebbin, started Airbnb, using an air mattress and a free breakfast option. This idea became a USD 30 billion company that is used all over the world today. It changes the way consumers and tourists find places to stay when they are traveling. Instead of booking in an expensive hotel or resort, people can merely contact a homeowner while photos and reviews of the property help users decide where they want to spend the holidays. Even in the Philippines, Airbnb has been a major site to book for people's holidays and travel since 2015. It is the easiest way for locals and even foreigners to check out properties when they plan to visit some places in the Philippines. More so, it serves as an excellent opportunity for Filipinos to earn some additional income, especially OFWs who may leave their house for weeks or longer like places in Tagaytay, Baguio, Cebu, and Davao. ([dotproperty.com.ph](http://dotproperty.com.ph))

Moreover, artificial intelligence can be used to improve customer service by completely comprehending the customer journey, properly profiling customers, and discovering what they want. It can reduce human involvement in the day-to-day activities of running a hotel, resulting in less human error, cost savings, and the ability to provide excellent service (Lacalle, 2021).

#### 5.7 Compatibility

Despite the fact that Artificial Intelligence is continuously improving, its use by illiterates remains limited (Reddy, 2006). These constraints must and will be overcome as necessary, using new solutions in conjunction with evolving technologies and updated policies. Whatever sectors AI replaces human efforts in, resulting in the discussion of AI replacing human intelligence, there are still many unanswered problems in numerous business segments. Despite the fact that "Artificial Intelligence" provides monetary and non-monetary benefits by substituting labor and offering a unique experience to clients, it will never be able to beat human intelligence because it is still a developing field (Laurent et al., 2015).

Customers more often are looking for a swift response to inquiries and action to their complaints and demanding to talk with people in a higher position. The customer journey from pre-experience to past experience, customers are usually in need of searching for information either through social media platforms or face-to-face with quick action. The interaction between humans and computers has been studied with a large number of approaches such as through natural language (NL) (Bradesko and Mladenec, 2012).

Another benefit of AI to the industry is the Chatbot applications, it can keep up with trends, provide better service to customers, constant communication, engagement, and monitoring of customer data, easy global approach. Chatbot applications are Facebook Messenger, slack, Telegram, Hangouts, Text Messages offer assistance to clients to discover

data nearly the industry gives, counsel their items accessibility, make reservations or bookings, and survey the customer's encounters with the benefit and many diverse commands. According to National Grid Vitality Gear, consumes nearly 12% of lodging income. AI-based machines can screen visitor comfort. AI-based cleaning machines, and automated scaled-down vacuum circles hand robot mops will keep the lodging clean decreasing workload of housekeeping staff.

However, with the advent of artificial technology that can improve customer experiences, it reduces the need for human labor. According to hospitality businesses have been investing more in technology in recent years to increase revenues and growth (Lourero, et al., 2021). Concurrently, AI may be the reason human talent is replaced by technology in some cases, compelling hospitality and tourism businesses to reform their structure and processes as a result (Saini et al., 2022). On the other hand, AI is an investment with high return, it gives a lofty quality of benefit, well-disposed to prerequisite of the lodging requirements, and to drive its assets for a good return. Its employment inhabitation information, criticism, and online surveys, self-detailed visitor information to prioritize the vital choices with the greatest benefits.

Several factors will influence organizational readiness, particularly in terms of AI adoption in the country. Some of the highlighted barriers are a lack of talent with aligned skills, budget limits, leadership knowledge, cultural resistance, and data availability (Dasgupta and Wendler, 2019). The most common barrier faced by small to medium-scale organizations in the country is a lack of competent talent to use AI. Some of the issues include knowing how to integrate AI into existing business processes as well as creating, deploying, maintaining, and interpreting AI/ML.

The budget limits come next. When an organization's skilled talent is in short supply, major problems arise. Investment is required to hire and retrain workers to be qualified personnel. Another stumbling block is a lack of resources, leadership awareness or direction and a lack of understanding. There is a lack of awareness of AI's capabilities from the top. Management can hinder the effective implementation of AI in the workplace. Furthermore, there is cultural resistance and dread. Another obstacle is data accessibility. It is an important aspect of adoption. With a scarcity of information, the use of a high-quality training dataset will be limited. In the worst-case scenario, AI/ML could lead to incorrect applications of data model development, constraints and limitations stated above. Barriers to AI adoption must be addressed effectively.

#### 5.8 Complexity

Innovation and technology have always been together. However, balancing of technology and people is essential. Personalized service like warm smiles, body language, and empathy for guests will never be replaced by any machine. Further, adaptability to change and to improve the efficiency of service, innovation, and technology is a must. A group researchers mentioned that technology must assist in improving speed, eliminating the possibility of mistakes, cutting costs, and improving efficiency and profitability (Bisoi et al., 2020). People need to be concerned with the upkeep and upgrades of the technology, before they get outdated. Everyone needs to keep in mind that technology should not impersonalize or dilute the interpersonal value internally or externally with customers.

Hotel and leisure industry's ultimate goal aside from achieving the maximum return on investments and high returns, customer seamless experience is the most important. Sudeshna Datta, Executive of Vice President and co-founder, absolute data, has quoted- that leveraging Data Science does not only work for hotels but is good for the customer too. The data can create a clear picture of what the customer is and what they want. From this, a hotel or a destination can tailor its ancillary services to meet these needs, providing a better stay experience and boosting incremental revenue at the same time.

Artificial Intelligence in hotel and leisure industry empowered supply chain administration frameworks and can guarantee the obtainment of the right quality of services at the right time with sensible cost resulting effective execution of benefits. In a nutshell, AI is necessary to be able to maximize profits while automating everyday tasks and reducing the amount of human effort required.

#### 5.9 Level of Adoption in the Philippine Hotel and Leisure Industry

The Philippines is still adjusting to the adoption of AI systems, but it can steer up globally by strengthening the technology governance by strictly implementing the policies with measures of the PDP 2017-2022 and its HNRDA regulations (Concepcion, 2019).

The AI Readiness Index for Southeast Asia assesses the quality and robustness of AI frameworks and ecosystems in the region. The rating took into account factors like acceptance, implementation, and AI technology support (Business World, 2019).

**Table 1: Philippine Readiness Index for AI Adoption**

Consumer readiness score	60.8
Corporate readiness score	33.5
Government readiness score	38.4
Overall readiness score	44.2

The Philippines has a consumer readiness score of 60.8, a corporate readiness score of 33.5, and a government readiness score of 38.4. Our country has a 44.2 overall readiness score for AI adoption on a scale of 0-100. The Philippines has a higher total score (44.2) than Indonesia (41.1). According to the Business World report, a country's AI readiness is directly proportional to its per capita GDP (Business World, 2019; Citturu et al, 2017).

### 5.10 Challenges in the Adoption of Artificial Intelligence in the Philippine Hotel and Leisure Industry

However, the advent of artificial technology that can improve customer experiences reduces the need for human labor. According to hospitality businesses have been investing more in technology in recent years to increase revenues and growth (Loureiro et al., 2021). Concurrently, AI may be the reason human talent is replaced by technology in some cases, compelling hospitality and tourism businesses to reform their structure and processes as a result (Saini et al., 2022). On the other hand, AI is an investment with high return, it gives a lofty quality of benefit, well-disposed to prerequisite of the lodging requirements, and to maneuver its assets for good return. Its employment inhabitation information, criticism and online surveys, self-detailed visitor information to prioritize the vital choices with the greatest benefits.

Several factors will influence organizational readiness, particularly in terms of AI adoption in the country. Lack of talent with aligned skills, budget limits, leadership knowledge, cultural resistance, and data availability are some of the highlighted barriers (Dasgupta and Wendler, 2019). The most common barrier faced by small to medium-scale organizations in the country is a lack of competent talent to use AI. Some of the issues include knowing how to integrate AI into existing business processes as well as creating, deploying, maintaining, and interpreting AI/ML.

The budget limits come next. When an organization's skilled talent is in short supply, major problems arise. Investment is required to hire and retrain workers. qualified personnel Another stumbling block is a lack of resources. leadership awareness or direction a lack of understanding and From the top, there is a lack of awareness of AI's capabilities. Management can stymie the effective implementation of AI in the workplace. the corporation Furthermore, there is cultural resistance and dread. Another obstacle is suggested. Also included in the barrier is data accessibility is an important aspect of adoption. a scarcity of information the use of a high-quality training dataset will be limited. In the worst-case scenario, AI/ML could lead to incorrect applications of data. model development the constraints and limitations stated above. Barriers to AI adoption must be addressed effectively.

## 6. CONCLUSION

Technology is an indispensable tool that makes daily tasks easier, and it has grown ubiquitous in human life. Nowadays, customer experiences are a driving factor for every firm in today's technologically challenged world. The advancement of technologies especially in the hotels and leisure industry has personalized the hotel industry's business. It has simplified the process of effectively serving guests.

It was found that benefits that can be derived from AI in hotel sectors can include higher efficiency with cost savings, enhancement of revenue, investment with high return, reputation management, and competitive intelligence. Furthermore, artificial intelligence can be utilized to improve customer service by fully comprehending the customer experience, accurately profiling clients, and learning what they desire. It has the potential to reduce human involvement in the day-to-day operations of a hotel, resulting in reduced human error, cost savings, and the ability to deliver exceptional service.

The result of the measurement of the AI Readiness Index in Southeast

Asia, the Philippines has a consumer readiness score of 60.8, a corporate readiness score of 33.5, and a government readiness score of 38.4. Our country has a 44.2 overall readiness score for AI adoption on a scale of 0-100. It could be seen that the score is in the mid-level and seemed to denote that there is promise in the adoption of AI in the country but a lot of effort and planning could still be employed.

It is critical to strike a balance between technology and people. Machines will never be able to replace personalized services such as warmth, smiles, body language, and empathy for guests. Adaptability to change and the ability to improve service efficiency through innovation and technology are also essential. Technology must aid in increasing speed, eliminating the potential of errors, cutting expenses, increasing efficiency, and increasing profitability. People must be concerned about technology upkeep and improvements before it becomes obsolete. Everyone must remember that technology should not impersonalize or dilute the interpersonal value of customers, either within or outside.

Artificial Intelligence solutions are designed to support hotel employees and can help boost the level of customer satisfaction while also reducing the problem-solving time of staff/employees and customers encountered. The hotel and leisure industry likewise invested in Artificial Intelligence such as five-star accommodations, restaurants, and adventure sites to bring out extraordinary experiences to every guest or customer. However, this modernization does not include the hotel and leisure industry in some areas of the Philippines, comparable in far-flung places, although they can be reached through vlogs, blogs, and even reviews of former visitors whom they used technology like social media which includes in the classification of Chatbots.

As discussed, AI is essential in every business or organization to cope with the past faced industries particularly the hospitality industry. Granting, the contribution of the AI in business and service industries, the compelling issue of this technology can replace human labor in the future, is still to watch out for. In terms of the future of AI in the Hotel and leisure in the Philippines, investments in AI will be the topmost concern in the organization to cope with globalization, to provide excellent service without halting the human capital.

## RECOMMENDATIONS

Based on the articles reviewed and discussed, it is hereby recommended the following: The industry should cooperate with the government and academe to develop the correct skill sets of graduates and workers. strengthening the technology governance by strictly implementing the policies such as PDP 2017-2022 and its HNRDA (Harmonized National Research and Development Agenda), conducting of researches about long-term effects of Artificial Intelligence and other related technologies on potentials, ethical risks, weaknesses, risks for customers and to employees particularly in service-oriented industries. Additional research could be conducted on the level of adoption of AI in different industries other than hotel and leisure industry, locally and internationally for a quantitative approach. On the area of qualitative research, focus group discussion, simulation among people directly working or exposed in AI in different sector of industries. Lastly, this paper is recommended to faculty and future researchers to be used in augmentation of new research ideas by incorporating other rudiments.

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