

Artificial Intelligence and Airports

Prepared by

Youssef Abelmotaleb Abdellatif Saad

Supervised by

Mohammed Anbar

Chapter 1

Introduction

Due to the introduction of AI, the aviation sector has changed forever, as have many other industries. Six recent articles from the field have been researched to give a clearer perception of these technologies concerning data collection, automation, and predictive maintenance of aviation infrastructure. Airport terminals are intricate systems that require the synchronous functioning of many processes. This research narrates about the use of AI technologies in the airport space and how this, in turn, enhances the performance, the integration, and the safety of an airport.

AI has become a game changer in aviation, as it is in every other sector, as the use of AI technologies allows for greater safety, adaptability, improvement, efficiency, capacity and greater support for all stakeholders in the aviation sector, as AI has become a major control over many aspects of aviation such as dynamic pricing that seeks to maximize revenue, in addition to optimizing pricing, predicting delays, optimizing flight paths and more. AI also works to improve pricing strategies through recommendation engines for detailed offers, sentiment analysis on social media, chatbots and customer service automation. AI is used in aviation by identifying passengers, checking their luggage and working to assist customers, as well as some of the challenges facing AI in aviation such as managing data confidentiality, investments and monitoring progress. Accordingly, the writer and researcher Jassim Haji prepared a research paper in which he discussed the role that artificial intelligence has come to play in the field of aviation and the challenges facing artificial intelligence in aviation. Owing to the importance of the topic, this research was conducted.

The problem statement

The technological and cognitive revolution has made a big difference in our life, as the widespread spread of these modern technologies has forced many business organizations to pay attention to this aspect and put it at the top of their priorities due to the great role of these technologies and their direct contributions to developing all institutions, improving their performance, as many modern technological means have been used such as networks, satellites, geographic information systems, database management systems (Imad, Alam El-Din, 2009).

One of the most important pillars of successful airport operations is the implementation of modern, highly efficient technical systems to achieve the lowest possible percentage of operational risks. Managing and controlling many airport runways and stations is inherently complex and a daily challenge. Artificial intelligence can also play a pivotal role in reshaping airport operations and innovating solutions to common problems facing airports Such as flight delays that lead to the suspension of thousands of passengers as well as cargo problems, environmental factors, and organizing baggage paths. And investing the airport's operational capacity in cases of non-occupancy.

In fact, there are many technologies based on data, artificial intelligence, Which constitute the solid ground for creating many applications that will provide technical solutions that enhance airport performance. Among them is computer vision, which is the main pillar of facial recognition technology to identify or confirm a person's identity using his face. It works according to three pillars: discovery, analysis, and recognition. Discovery includes finding a face in an image or video clip through computer vision, extracting useful information from image data, analysing, classifying and understanding it. Thus, the problem of the research can be stated as follows:

What is the effect of using Artificial Intelligence in enhancing the services in airports?

*** The study objectives**

The research Objectives can be stated as follows:

1. To comprehensively analyze the existing uses of Artificial Intelligence in Airports.
 - To identify the current uses of Artificial Intelligence in Airports as outlined in the literature.
2. To evaluate existing uses of Artificial Intelligence in Airports frameworks:
 - To explore alternative validation approaches proposed by scholars regarding uses of Artificial Intelligence in Airports.
3. To propose a comprehensive framework for enhancing the use of uses of Artificial Intelligence in Airports.
 - To develop a framework that addresses the uses of Artificial Intelligence in Airports.
4. To validate the proposed framework in diverse AI application.
 - To assess the generalizability and effectiveness of the proposed framework in various AI contexts.
5. To provide practical recommendations for the implementation of the proposed framework:
 - To contribute to the ongoing discourse on responsible and trustworthy AI development.

The research scope:

The objective scope: This research is about Artificial Intelligence and Airports

The location scope: The research was conducted in Riyadh

The timing scope: The research was conducted in 2024, December.

Chapter 2
Literature Review

The literature review

There were many studies which threw light on the event management and the use of technology tools in organizing the events. In the study of (Saleh, 2019), which entitled "The impact of applying artificial intelligence and emotional intelligence on the quality of decision-making", this study aimed to reveal the impact of applying artificial intelligence and emotional intelligence on the quality of decision-making, and to achieve the goal of the study, the researcher used the opinions of a sample of 98 managers of Jordanian commercial banks, and the study reached several results, most notably the existence of a statistically significant relationship between the use of artificial intelligence methods and the quality of administrative decision-making.

Another study was conducted by (Al-Hawamdeh, Abdel Moneim, 2018) which was entitled "The impact of artificial intelligence in creating the correct strategic thinking for entrepreneurial leaders of business organizations to achieve added value for their strategic operations - a proposed model". The study aimed to clarify the impact of artificial intelligence on strategic thinking among entrepreneurial leaders of business organizations. The study showed that entrepreneurial leadership with an intellectual starting point has received the attention of organizations due to the need of those organizations for leadership that possesses strategic thinking that alterations with the change in the surrounding circumstances as a result of the acceleration of the complex environmental conditions surrounding those organizations; the emergence of the phenomenon of globalization, knowledge economy and technological progress, which may be represented in artificial intelligence technologies, therefore, it is expected that entrepreneurial leaders possess the qualities of intellectual stimulation, which is an important matter in entrepreneurial leadership by adopting advanced technological techniques in the work environment, and that it is expected to

help them achieve the visions of their organizations to reach local and global leadership.

Also, in the Study of (Naseef, 2017) which entitled "Using artificial intelligence systems as a tool for excellence in quality and competitiveness: A field study in the private hospital sector in Jeddah Governorate." The study sought to clarify the role of artificial intelligence systems as a tool for achieving excellence in quality and competitiveness in Saudi private hospitals. To achieve the study's objective, the researcher designed a questionnaire that he later distributed to a sample of 15 managers in three private hospitals in Jeddah Governorate. The study concluded by proving the effective role of artificial intelligence systems in achieving quality and excellence. Let alone, in another study conducted by (Al-Younis, 2016), which was entitled "Using Artificial Intelligence Technology in Re-Engineering Operations in Application at the General Company for the Manufacture of Pharmaceuticals and Medical Supplies in Nineveh". The study aimed to clarify the relationship between the use of artificial intelligence and the process of re-engineering operations in organizations. To achieve the aforementioned objective, the researcher developed a questionnaire tool that was later distributed to a sample of 50 managers at the General Company for the Manufacture of Pharmaceuticals and Medical Supplies in Nineveh Governorate, Iraq. The study finally concluded that there is a positive correlation between artificial intelligence technology and re-engineering operations in the company under study.

Also, in the study of (Shahid and Li, 2019) which entitled: "The Impact of Artificial Intelligence on Marketing: The Perspective of Marketing Professionals in Pakistan", which aimed to reveal the impact of artificial intelligence on marketing functions in Pakistani educational organizations. To achieve the aforementioned goal, the researchers conducted interviews with 10 marketing professionals in Pakistani companies. The study concluded that integrating modern

applications of artificial intelligence into various marketing functions in organizations would improve the performance of activities, improve the organization's profitability, and achieve a competitive advantage.

In another study conducted by (Geisel, 2018) which entitled "The Current and Future Impact of Artificial Intelligence on Business", this study sought to clarify the current and future impacts of artificial intelligence applications on business, and to achieve the study's goal, this study came in a descriptive theoretical form in which the researcher addressed the benefits of artificial intelligence, and the study relied on the interview tool, while the researcher concluded her study by analyzing the most prominent current and future areas of applying artificial intelligence in the field of business, which are: trade, marketing, sales, finance, accounting, and the researcher indicated in the end that artificial intelligence applications develop the level of services provided by organizations, and that artificial intelligence applications will witness huge developments and leaps in the future, so organizations must keep pace with various contemporary technological developments.

Also, in the study of (Kenneth Payne, 2018) which entitled "Artificial Intelligence, a Revolution in Strategic Operations Related to Organizational Management", where the study attempted to reveal the impact of artificial intelligence on strategic operations management in organizations. The study highlighted that there are some interesting similarities between the modern development of artificial intelligence systems and the development of strategic thinking within organizations. The study also explained that it is necessary to pay attention to the distinguished mental capabilities in various organizations while investing in the organizational characteristics that enhance the role of strategic leadership in generating new creative initiatives related to artificial intelligence applications. The study relied on the interview and observation

tool, and the results showed that the use of artificial intelligence applications in strategic operations management within organizations achieves the elements of innovation and initiative for those organizations, which ensures the building of a sustainable competitive advantage for the services provided, which necessitates the necessity of achieving harmony and interconnection between strategic thinking capabilities and development in artificial intelligence. The study also showed that integrating the supply chain into work affects the increase in the competitive advantage of organizations, and that the relationship between the supply chain and competitive advantage is positive. The study recommended the necessity of integrating the supply chain into organizations to achieve competitive advantage.

In addition, in the study of (Daekwan Kim, 2020) which showed that artificial intelligence tools represented by advanced artificial intelligence tools, appropriate artificial intelligence tools, and supply chain communication systems have a significant impact on enhancing the capabilities of the organization's internal communication channels, which in turn facilitates the exchange and transmission of information within the organization, enhances internal coordination, and the response of supply chains, which are factors that positively affect the performance of the organization as a whole. Advanced artificial intelligence tools also have a moderate impact on the performance of communication systems related to supply chains, as artificial intelligence tools appropriate for communication systems in supply chains enhance the exchange of information within the organization and coordination of direct activities.

The study also showed the impact of the supply strategy in terms of reducing inventory, flexibility, and purchase price on institutional performance, and that high-performing organizations focus on achieving competitive advantages related primarily to quality, flexibility, reliability, and delivery, and secondarily to cost.

Furthermore, in the study of (Lee & Whang, 2019) which indicated that successful organizations apply the basic principles and ideas of the supply chain in highly effective ways. These principles include information exchange, cooperation between supply chain partners, and responding to consumer desires. The Internet is one of the main tools in artificial intelligence tools that allowed organizations to create creative solutions that contributed to raising the ability to adopt the basic principles of the supply chain. It also became clear that organizations that used artificial intelligence tools in their operations, in order to redefine supply chain integration, were able to achieve high levels of efficiency and effectiveness, as well as achieve a competitive margin over real competitors.

The results also showed that exploiting artificial intelligence tools leads to reducing shipping and supply costs, which may reach reducing the time required to complete various operations and operational activities.

Finally in the study of (Tallir, 2017) which indicated that the evaluation of artificial intelligence tools and information systems should be based on the elements of cost, flexibility, quality, and time, as the elements of cost, flexibility, quality, and time directly affect strategic level planning, tactical level planning, and operational level planning, and supply chain management works to manage and coordinate these activities, which requires the introduction of technologies that help facilitate these processes by relying on artificial intelligence tools.

In the study of (Vinothkumar Jaikumar, karunamurthy, 2023) the study clarified that the quest for generalized AI models continues, while data quality and domain adaptability remain concerns. Regulatory efforts and collaborative initiatives are shaping the ethical and policy dimensions of AI, aligning technology with societal values.

In another study conducted by (Michael Haenlein, Andreas Kaplan, 2019), the study affirmed that Depending on its cognitive, emotional, and social intelligence, artificial intelligence can be divided into three categories: analytical, human-inspired, and humanized. A limited approach that only impacts some countries but not others is unlikely to be successful in the long run due to the nature of AI.

Also, in the study of (Xiangjie Kong, et al., 2018), the study affirmed that the decline of self-references suggests that AI is growing more tolerant from the standpoint of reference behavior. The key publications, scholars, and organizations that found highlight significant moments in the evolution of this area.

In the study of (Iain M. Cockburn, et al., 2018) the study affirmed that the possibility of a shift in the innovation process presents important questions for a variety of management and policy domains, from how to assess this novel science to the possibility that prediction techniques could create new obstacles to entry in a broad range of sectors.

In the study of (Yeabtsega Behailu Adere, 2023), the study affirmed that AI has the ability to enhance patient outcomes and deliver more effective and efficient healthcare services, according to the report. By offering individualized and flexible learning opportunities, it can also revolutionize education. However, there are worries about job displacement and the possibility of economic injustice when AI is used in the workplace. The study also assesses the ethical ramifications of AI and highlights the necessity of developing and using AI systems responsibly. To address concerns like prejudice, privacy, and openness, ethical frameworks and rules are necessary. All things considered, this research paper offers a thorough analysis of how AI is affecting different facets of society, highlights important trends and implementation-related difficulties, and suggests potential solutions to these problems.

Also, (Renato Lopes da Costa, 2022), the study affirmed that Numerous sectors use project management, and it is not exempt from the advancements that artificial intelligence is bringing about globally. Nevertheless, artificial intelligence is not yet widely used in businesses, particularly not in all project management domains. Although the exact causes are unknown, they appear to be connected to the unpredictability of using artificial intelligence in project management.

Most articles are new articles starting from 2018 until 2023. Literature review is clear and the data submitted is good. All articles use citations are well cited. All articles applied the scientific procedures in their data. All articles indicated that the technological and cognitive revolution has made a big difference in the subject of event management, as the widespread spread of these modern technologies has forced many business organizations to pay attention to this aspect and put it at the top of their priorities due to the great role of these technologies and their direct contributions to developing all institutions, improving their performance.

The studies indicated that there are many technological means that help organizations use it as a distribution channel that ensures that their products reach these markets in a manner that suits the organization and customers, as well as the AI which can be used in different organizations, as a tool for marketing communications in its various forms, allows the organization the ability to develop its services.

The previous articles indicated that Cameras and sensors supported by AI technology and AI algorithms eliminate limitations and observe the mobility of people resulting in effective reduction of crowds and enhancement of the boarding process. Also, most articles indicated that Increase of Operational Effectiveness of AI. It has been observed when airlines employed systems powered by AI and data from AI devices for scheduling resources, it enabled youths to be much better. For example, it has been demonstrated that AI algorithms can optimize the scheduling of arrival flights

from gate assignments and reduce reasonable waiting time and hence decrease the cost of operations. AI devices applications deployed at airports had enabled the automated provision of flight updates and other notifications that creates a unique experience for the user. All hesitant travelers were supported cross service by AI based Chatbots which made customer services better. The data received from AI devices are processed using advanced machine learning algorithms to find out traceable actions to avoid intrusions. This pre-emptive step enhances security features and assists to lower risks. There are many things that call for concern when it comes to the security and safety of AI Devices and their applications in the airport operations. However, certain mechanisms can be employed to try and manage these concerns as there is a dire need to try and protect the airport operations from such threats.

A good integration of Data Analytics in Aviation stakeholders should strategically make use of the collaborative models exemplified by this study as they can enable them to aggregate different data sources for instance sensors and cameras to Early Warning Systems which would be effective in sustaining business continuity. There are many things that call for concern when it comes to the security and safety of AI Devices and their applications in the airport operations. However, certain mechanisms can be employed to try and manage these concerns as there is a dire need to try and protect the airport operations from such threats. A good integration of Data Analytics in Aviation stakeholders should strategically make use of the collaborative models exemplified by this study as they can enable them to aggregate different data sources for instance sensors and cameras to Early Warning Systems which would be effective in sustaining business continuity.

The following are the most prominent uses of artificial intelligence in the aviation industry.

- Passenger identification: Machines identify passengers and record their arrival at the airport. Delta Air Lines has tested this process through some initiatives such as Delta ticket kiosks and phone check-in through the “Fly Delta” app.
- Baggage inspection: American Airlines launched an application development competition with the aim of developing an application that facilitates the process of checking passengers’ luggage.
- Customer assistance: United Airlines uses Amazon's Alexa to answer customer inquiries. The company announced its use of Alexa in September 2017, which answers common passenger questions such as check-in and onboard Wi-Fi.

The air transport sector faces new challenges such as reliance on advanced systems in aircraft, which increases the complexity of operations and maintenance, as well as the increase in air traffic of aircraft, compliance with more stringent environmental standards, and competitiveness among commercial airlines, for which AI can provide opportunities. A wide range of AI applications can be used in the field of aviation. For example, enhancing virtual assistance to the pilot by providing advice on routine tasks or providing enhanced advice in high workload conditions, which helps the crew in decision-making processes. AI can provide predictions that help prevent some critical situations according to operational conditions and the status of the crew (such as physical stress). Or when calculating the amount of fuel for the flight and detecting ice, etc. The use of AI may develop to include complex models on board aircraft systems that are more efficient in processing and storing data, with the possibility of advanced automation of aircraft systems, and reaching aircraft designs capable of performing autonomous flights, which currently face many difficulties in complying with the safety requirements of manned aircraft designs. In contrast, the emergence of air taxi systems in urban air mobility helps design these vehicles based on systems to enable complex decisions to ensure safe flight and landing or to manage the separation between air

vehicles at reduced distances. This is where artificial intelligence comes in to process and use the huge amount of data generated by the integrated sensors and as a result of machine-to-machine communications between vehicles to support such flights without human intervention.

Most articles assured that there are many challenges facing the aviation industry as AI becomes more widely applied. Below, the most prominent of these challenges.

- **Data confidentiality management:** As the aviation industry adopts AI, large amounts of data will be used, which will put data and information security at risk. The need to properly manage data is not a new challenge for airlines.
- **Progress monitoring:** Monitoring and tracking progress is another challenge for airlines. These companies first need to develop analytics that help them develop and process data accurately. This in itself is a challenge due to the difficulty of determining the appropriate type of analytics.
- **Investment management:** AI technology requires huge investments, which poses a challenge for small airlines that will not have sufficient capabilities to fully implement AI technologies. The solution to this problem may be represented in mergers and acquisitions, as large airlines may have a desire to acquire small airlines, and there are some small airlines that have a tendency to adopt AI technologies, such as Southwest Airlines.

Chapter III

Methodology

In this chapter, key information about the methodology, target population, sample, expected results will be provided.

The research methodology

A descriptive approach will be used for this study where the Artificial Intelligence and Airports will be assessed. The descriptive method means “one of the forms of organized scientific analysis and interpretation; to describe a specific phenomenon or problem and depict it quantitatively by collecting standardized data and information about the phenomenon or problem, classifying it, analyzing it, and subjecting it to accurate study.”

The research sample

A total of 50 of university students will be the research sample. A sample is defined as a smaller set of data that a researcher selects or chooses from a larger population using a pre-determined selection method. These items are known as sample points, sampling units, or observations. Creating a sample is an effective way to conduct research.

The Measuring Instrument

The survey questionnaire will be used. It will include demographic questions such as age, educational level and marital status. The instrument will used a 6-point Likert scale with each question has a score rating from “1-6”. The minimum score is ‘1- strongly disagree’, 2 ‘moderately disagree’, 3 ‘disagree’, 4 ‘agree’, 5 ‘moderately agree’, and maximum score is ‘6-strongly agree’. It is a tool for obtaining, and it is a set of questions and written statements provided with their answers and possible opinions' or with a blank for answering. The questionnaire is used to obtain information, data and facts that are only known to the individuals concerned with the subject of the questionnaire and we cannot obtain this information using another tool.

Expected results

- The use of advanced technology such as artificial intelligence to manage baggage at airports over the next decade will make mishandling of baggage a rare occurrence despite the continuous increase in the number of passengers annually.
- The report showed that all baggage handling systems around the world currently handle more than 4.5 billion bags annually, with expectations that this number will double over the next twenty years, which requires airlines and airports to prepare for this.
- The air transport sector, according to the report, has also witnessed significant improvements in technology and handling operations over the past decade, which has contributed to a significant decrease in the costs resulting from incorrect baggage handling from \$4.22 billion to \$2.1 billion.
- The purposeful use of data and artificial intelligence technologies will revolutionize the air transport sector, as SITA plays a pivotal role in identifying the potential of data issued by the sector as a whole, including baggage management, which is of great interest to the company, seeking to achieve innovation through cooperation with all those working in the sector.
- Using this data with artificial intelligence tools will contribute to enhancing the efficiency of baggage handling operations, which contributes to providing a better passenger experience.
- AI will provide airlines and airports with comprehensive information about which routes are causing the most stress on the systems and what factors are causing this

stress. AI will also provide analysis and suggestions about baggage movement patterns so that baggage can be delivered more efficiently.

- AI-powered devices will enable baggage management from the moment it is received from passengers to the moment it arrives at its destination without any human intervention in this process, in addition to providing real-time data during the journey to the airline, airport and passengers.
- The use of AI has recently witnessed remarkable progress, and the air transport community is working to benefit from the expertise of the supply chain sector, which is the leading sector in applying business models based on AI.
- The use of AI technologies will bring about a qualitative shift within the sector over the next decade. Although AI technologies have not yet reached the desired level and require more time, baggage handling operations will witness more services that airports and airlines can provide to passengers.

Conclusion

The integration of AI has advanced and revolutionized the aviation industry. Airports that are able to adapt these technologies will be able to demonstrate more efficiency, better passenger satisfaction, and good security systems. Long-term focus on development of AI would be critical for overcoming current issues and further enhancing the features of smart airports ecosystems. AI is having a profound impact on the efficiency of aviation professionals, and the entire aviation industry needs to prepare for this significant change.

- **Dynamic pricing:** AI in aviation seeks to maximize revenue, with airlines optimizing their already calculated base published fares based on flight characteristics and broad segmentation, adjusting fares after assessing details about passengers and current market conditions.

- Pricing optimization: Similar to dynamic pricing, these algorithms look for ways to optimize long-term sales revenue to ensure all flights are optimally booked.
- Flight delay prediction: Since flight delays depend on a wide range of factors, including weather conditions and what's happening at other airports, an intelligent system can be applied to analyze massive data sets in real time to predict delays and rebook customers' flights in a timely manner.
- Flight route optimization: Consider machine learning-powered systems that can find optimal flight paths, resulting in optimally booked and timed flights, lower operating costs, and increased customer retention.
- Avoiding Travel Disruption: Amadeus, a leading global distribution system (GDS), has developed a schedule recovery system to help airlines mitigate the risk of travel disruption.
- Crew Scheduling: The number of flight crews at major carriers has grown and their expenses now often exceed \$1.3 billion annually, the second largest component of the total operating cost for major carriers (besides fuel).
- Fraud Detection: By analyzing specific customer travel and purchase patterns and correlating them with historical data, algorithms can identify suspicious credit card transactions and eliminate fraud, saving airlines and travel companies millions of dollars each year.

Recommendations

For strategic thinking, direction and focus of efforts, it is necessary for institutions to define the purpose of their initial efforts in the field of artificial intelligence and their area of focus, and then identify the obstacles that may face the workflow during the transition phase to artificial intelligence, which includes many advantages, including: early analysis of diseases, providing

better medical services, and diagnosing diseases, which contributes to improving the quality of services, in addition to its importance in automating tasks to increase efficiency and cost.

Gantt chart

WBS NUMBER	TASK TITLE	DURATION	PCT OF TASK COMPLETE	WEEK 1					WEEK 2					WEEK 3					WEEK 4				
				M	T	W	R	F	M	T	W	R	F	M	T	W	R	F	M	T	W	R	F
1	Chapter 1	7																					
1.1	Objective	1	100%																				
1.2	The articles	3	100%																				
1.3	The articles Summaries	1	100%																				
1.4	Critical Analysis	1	100%																				
1.5	Synthesis of Information	1	100%																				
2	Chapter 2	7	100%																				
2.1	Problem statement	2	100%																				
2.2	Literature review	5	100%																				
3	Chapter 3	7	100%																				
3.1	Methodology	3	100%																				
3.2	Expected results	4	100%																				
4	Conclusion	3	0%																				
5	Recommendations	3	0%																				
6	References	1																					

References

- Al-Hawamdeh, Tharwat Amd, Abdul-Moneim, Osama. (2018). The impact of artificial intelligence in creating the correct strategic thinking for entrepreneurial leaders of business organizations to achieve added value for their strategic workforce - a proposed model, Jerash University.
- Geisel A, (2018), The current and future impact of artificial intelligence on business, International Journal of Scientific and Technology Research, Vol. (07), No. (05), PP: 116-122.
- Imad, Hassan, Alam Al-Din, Mahmoud. (2009). Information and Communication Technology, Arab House for Publishing and Distribution, Cairo.
- Kenneth Payne. (2018). Artificial Intelligence: A Revolution in Strategic Affairs?
<https://doi.org/10.1080/00396338.2018.1518374>
- Naseef Omar Abdullah. (2010). Using Artificial Intelligence Systems as a Tool for Excellence in Quality and Competitiveness: A Field Study in the Private Hospital Sector in Jeddah Governorate, Andalusia Journal of Social and Applied Sciences, Volume 3, Issue 5, Andalusia University, Yemen
- Saleh, Faten Abdullah. (2019). The impact of applying artificial intelligence and emotional intelligence on the quality of decision-making, Master's thesis in Business Administration, College of Business, Middle East University, Amman, Jordan.
- Shahid M Z, Li G, (2019), Impact of artificial intelligence in marketing: A perspective of marketing professionals of Pakistan, Global Journal of Management and Business, Vol. (19), No. (02), PP: 26-33.
- TallIr, K. (2017) An IT/IS Acquisition & Justification Model for Supply Chain Management, Working Paper, Faculty of Economics and Business, University of Zagreb.

Wang, w, lin, h., & chu, c.(2020(. Types of competitive advantage & analysis, international journal of business & management, 6(5).

Whang S., (2019), “E-Business and supply chain integration”, Stanford university .

References

- Vinothkumar Jaikumar , A.karunamurthy .(2023) Recent Advancements in Artificial Intelligence Technology: Trends and Implications Quing International Journal of Multidisciplinary Scientific Research and Development 2(1):1-11, OI:10.54368/qijmsrd.2.1.0003
- Michael Haenlein, Andreas Kaplan .(2019).A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence, July 2019California Management Review 61(4):000812561986492, DOI:10.1177/0008125619864925
- Xiangjie Kong, Zhejiang, Xiaomei Bai .(2018). Artificial Intelligence in the 21st Century, Article in IEEE Access ·10.1109/ACCESS.2018.2819688.
- Iain M. Cockburn, Rebecca Henderson, Scott Stern .(2018). THE IMPACT OF ARTIFICIAL INTELLIGENCE ON INNOVATION NATIONAL BUREAU OF ECONOMIC RESEARCH, 1050 Massachusetts Avenue, Cambridge, MA 02138
- Yeabtsega Behailu Adere .(2023). THE IMPACT OF ARTIFICIAL INTELLIGENCE ON SOCIETY International Research Journal of Engineering IT & Scientific Research 5(10) DOI:10.56726/IRJMETS45708
- Renato Lopes da Costa .(2022).Artificial Intelligence in Project Management: Systematic Literature Review International Journal of Technology Intelligence and Planning 13(2):1, DOI:10.1504/IJTIP.2022.10050400
- Al-Hawamdeh, Tharwat Amd, Abdul-Moneim, Osama. (2018). The impact of artificial intelligence in creating the correct strategic thinking for entrepreneurial leaders of business organizations to achieve added value for their strategic workforce - a proposed model, Jerash University.

- Geisel A, (2018), The current and future impact of artificial intelligence on business, International Journal of Scientific and Technology Research, Vol. (07), No. (05), PP: 116-122.
- Imad, Hassan, Alam Al-Din, Mahmoud. (2009). Information and Communication Technology, Arab House for Publishing and Distribution, Cairo.
- Kenneth Payne. (2018). Artificial Intelligence: A Revolution in Strategic Affairs?
<https://doi.org/10.1080/00396338.2018.1518374>
- Naseef Omar Abdullah. (2010). Using Artificial Intelligence Systems as a Tool for Excellence in Quality and Competitiveness: A Field Study in the Private Hospital Sector in Jeddah Governorate, Andalusia Journal of Social and Applied Sciences, Volume 3, Issue 5, Andalusia University, Yemen
- Saleh, Faten Abdullah. (2019). The impact of applying artificial intelligence and emotional intelligence on the quality of decision-making, Master's thesis in Business Administration, College of Business, Middle East University, Amman, Jordan.
- Shahid M Z, Li G, (2019), Impact of artificial intelligence in marketing: A perspective of marketing professionals of Pakistan, Global Journal of Management and Business, Vol. (19), No. (02), PP: 26-33.
- Tallir, K. (2017) An IT/IS Acquisition & Justification Model for Supply Chain Management, Working Paper, Faculty of Economics and Business, University of Zagreb.
- Wang, w, lin, h., & chu, c.(2020(. Types of competitive advantage & analysis, international journal of business & management, 6(5).
- Whang S., (2019), "E-Business and supply chain integration", Stanford university .

The index

Chapter 1	2
Introduction.....	3
The problem statement.....	4
* The study objectives.....	5
Chapter 2	6
Literature Review	6
The literature review	7
Chapter III.....	17
Methodology	17
<i>The research methodology.....</i>	<i>18</i>
<i>The research sample</i>	<i>18</i>
<i>The Measuring Instrument.....</i>	<i>18</i>
<i>Expected results.....</i>	<i>19</i>
Conclusion	20
Recommendations	21
Gantt chart	23
References.....	24