

**T.C.
BAHÇEŞEHİR UNIVERSITY
GRADUATE SCHOOL
THE DEPARTMENT OF BUSINESS ADMINISTRATION**

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**ARTIFICIAL INTELLIGENCE (AI) IN THE FINANCIAL
SECTOR: THE MIDDLE EAST AND NORTH AFRICA
(MENA) REGION CASE**

**MASTER'S THESIS
ASEEL ABU HASHISH**

BAU 2023

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Doç. Dr. Mustafa SUNDU

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ABSTRACT

ARTIFICIAL INTELLIGENCE (AI) IN THE FINANCIAL SECTOR: THE MIDDLE EAST AND NORTH AFRICA (MENA) REGION CASE

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Entrepreneurship and Innovation Management

Assoc. Prof. Dr. Mustafa SUNDU

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This study examines the views of financial employees on the application and implications of Artificial Intelligence (AI) technology tools in the financial sector of the Middle East and North Africa (MENA) region. By the utilization of both quantitative and qualitative research approaches, our objective is to unveil the fundamental elements influencing the perspectives of employees regarding the integration of AI in their respective professional spheres. Our study illuminates a nuanced interaction involving optimism, skepticism, and uncertainty, particularly among financial professionals in the MENA region as they navigate the potential advantages and hurdles posed by AI-driven advancements. These findings offer valuable insights for financial institutions, policymakers, and AI technology providers, helping to ensure a more comprehensive understanding of the workforce's perspective on AI's role in the region's financial sector.

Keywords: Artificial Intelligence (AI), Financial Sector, Middle East, and North Africa (MENA), Adoption

ÖZ

FİNANS SEKTÖRÜNDE YAPAY ZEKA (YZ): ORTA DOĞU VE KUZEY AFRİKA (ODKA) BÖLGESİ ÖRNEĞİ

Abu Hashish, Aseel

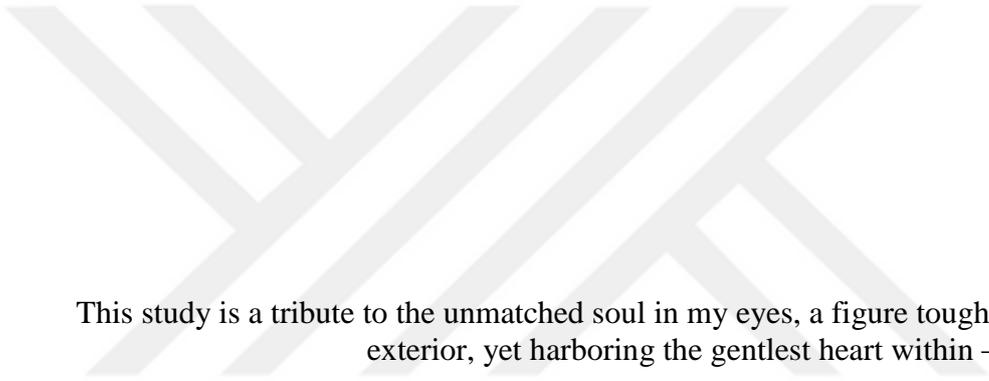
Girişimcilik ve İnovasyon Yönetimi

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Bu çalışma, Orta Doğu ve Kuzey Afrika (ODKA) bölgesindeki finans sektöründe yapay zeka (YZ) teknolojisi araçlarının uygulanması ve sonuçları hakkında finans çalışanlarının görüşlerini incelemektedir. Hem niceliksel hem de niteliksel araştırma yöntemlerini kullanarak, çalışanların profesyonel alanlarında YZ benimsemesine yönelik tutumlarını şekillendiren temel faktörleri ortaya çıkarmayı amaçlıyoruz. Araştırmamız, ODKA bölgesindeki finans çalışanlarının YZ destekli yeniliklerin sunduğu potansiyel fayda ve zorluklarla mücadele ederken, iyimserlik, şüphecilik ve belirsizlik arasındaki karmaşık etkileşimi vurgulamaktadır. Bu bulgular, finans kurumları, politika yapıcılar ve YZ teknolojisi sağlayıcıları için değerli içgörüler sunarak, işgücünün bölgedeki finans sektöründeki AI'nin rolü üzerine bakış açısını daha kapsamlı bir şekilde anlamalarına yardımcı olmaktadır.

Anahtar kelimeler: Yapay Zeka (AI), Finans Sektörü, Orta Doğu ve Kuzey Afrika (MENA), Benimsenme



This study is a tribute to the unmatched soul in my eyes, a figure toughened by the exterior, yet harboring the gentlest heart within – my father.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
ANOVA	Analysis of Variance
ATU	Attitude Towards Usage
BI	Behavioral Intentions
CS	Computer Science
FI	Firm Innovativeness
FinTech	Financial Technology
IT	Information Technology
MENA	Middle East and North Africa
ML	Machine Learning
NLP	Natural Language Processing
ODKA	Orta Doğu ve Kuzey Afrika
P2P	Peer to Peer
PEOU	Perceived Ease of Use
PU	PU
SMEs	Small and Medium-Sized Enterprises
YZ	Yabay Zeka

Chapter 1

Introduction

The financial industry has undergone a profound shift very excessively due to the revolutions in Financial Technology (FinTech) and artificial intelligence (AI) (Rasiwala & Kohli, 2021), presenting both novel opportunities and challenges for institutions and professionals alike. Increasingly, financial institutions are more incorporating AI-driven technologies, innovations, and terminologies such as machine learning (ML), natural language processing (NLP), and data analytics to enhance operational ability, efficiency, elevate client experiences, and more effectively mitigate risks. (Pandey & Sergeeva, 2022) Grasping the impact and focus of these technological strides on the financial sector is paramount as AI persists in reshaping conventional financial services and their modules.

The adoption and integration of AI applications of Machine Learning in the financial industry within MENA areas are genuinely influenced by its diverse cultural, economic, entrepreneur and political landscape. The regions and areas that belong to it have recent emphasis on economic diversification and the emergence of knowledge-based industries has led to substantial economic growth and its efficient stability. As a result, the financial discipline in the MENA region is experiencing notable changes, with both established entities and emerging participants actively leveraging the capabilities of AI and FinTech. This strategic approach is aimed at attaining a competitive advantage, maintaining strategic paths, and delivering enhanced services to clients. (Govil, 2022)

While there is a burgeoning interest in AI applications and their sectors within the global financial sector, there exists a dearth of research on their impact on the financial spaces and financial arts in the MENA region. This research gap prompts inquiries into the specific challenges and opportunities associated with adopting AI applications in the region, along with understanding the curriculum and perceptions of financial professionals directly involved. Furthermore, the comprehensive and additive exploration of both positive and negative impacts of AI applications on the financial sector in the MENA area remains insufficiently

examined. This underscores the need of the hour for further investigation to provide insights that can inform decision-making processes for pertinent stakeholders.

As the MENA region undergoes digitalization, factorial innovation and embraces innovation, it becomes imperative to comprehend the ramifications of AI on the financial discipline within this distinctive context (Shahbaz, Haouas, Sohag, & Ozturk, 2020), encompassing both positive and negative facts. This master's thesis endeavors to scrutinize the influence of AI applications within the financial discipline in the MENA region and delve into the perspectives of financial concerns, political and socialists, and professionals concerning these technologies. The objective is to furnish valuable insights for financial arts institutions, policymakers, and researchers invested in the evolution and assimilation of AI and FinTech in this dynamically evolving region and its areas.

1.1. Problem Statement

Although the impact of AI applications and uses on the financial sector has undergone extensive and intensive examination in developed countries, a conspicuous gap exists in comprehensive and detailed studies concentrated on the MENA region. This research void prompts inquiries into the specific challenges, creatives and opportunities associated with adopting AI applications and its uses in the region of the particular area, along with a focus on the perspectives of financial professionals and proficient experts on the ground. The distinctive cultural, economic, and political landscape of the MENA region accentuates and authenticates the necessity for a more thorough comprehension of the influence of AI applications on the financial sector within this context.

Furthermore, the current research tends to concentrate on either the favorable or unfavorable aspects of AI applications and its uses primarily and excessively in the financial sectoral region, resulting in an imbalanced portrayal of the subject. A more all-encompassing approach is imperative to summarize and scrutinize the dual perspective encompassing both the positive and negative impacts of AI applications on the financial discipline in the MENA region specifically. This approach aims to provide a nuanced and a unique understanding that can effectively guide decision-making processes for pertinent stakeholders, entrepreneurs including financial institutions, policymakers, and shareholders.

Acknowledging the escalation of significance of FinTech in the global economy and the imperative for the MENA region to align with technological development and innovative minds, it is crucial to bridge this research gap and educational reasoning. An important examination of the enhancement of AI uses within the financial sector of MENA region, promoting both opportunities and challenges, will yield very useful insights. This research endeavor aims to inform strategies for effective installation, ultimately contributing to the sustainable growth and development of the financial discipline.

1.2. Research Purpose

The focus of AI applications on the financial department has been thoroughly investigated in developed countries; nevertheless, there is a conspicuous get off to comprehensive studies dedicated to the MENA region. This research gap prompts inquiries into the challenges and to adopting AI uses in the regions, as well as the perspectives of financial professionals. The distinctive cultural, economic, and political landscape of the MENA regional areas underscores the necessity for a more profound understanding of the fundamentals of AI uses on the financial department within context.

Far more, prevailing new research trends tend to disproportionately emphasize either the positive or negative facts of AI applications in the financial sector, resulting in an imbalanced perspective on the subject. A more inclusive approach is imperative to explore the dual perspective encompassing both the positive and negative impacts of AI applications on the financial sectoral area in the MENA region specifically. This detailed investigation aims to provide a useful understanding that can effectively guide decision-making processes for pertinent stakeholders, including financial institutions and policymakers.

As for the escalating environment of FinTech in the world and the imperative for the MENA region to go through technological advancements, rectifying the research gap which is more exciting. In modification of the impact of AI uses within the financial department in the MENA area, encloding both opportunities and challenges, will yield useful insights. This detailed investigation aims to know the strategies for effective implementation, ultimately contributing to the sustainable growth and development of the financial department.

1.3. Research Question

The fast development of AI is significantly more impacting the financial industry departments, leading to more catchment with the transformative innovation. The adoption of AI applications and their uses in finance is reshaping and rechanging the landscape of the sector in the MENA areas, introducing novel opportunities, abilities, and challenges. This study research is centered around primary as well as two secondary research questions aimed at gaining a deeper understanding of the repercussions of AI integration in the financial sectoral discipline of the MENA region.:

RQ1: What is the prevailing viewpoint of the financial workforce regarding the integration of AI applications in the MENA region?

RQ2: What potential advancements in AI applications are anticipated for the financial sector within the MENA region?

1.4. Significance of the Study

The significance and importance of the study lies in its potential contributions to the understanding of the focus of AI applications on the financial sector in the MENA region, addressing the research gap in the existing literature. Some of the key aspects of the study's significance include:

- **Comprehensive Analysis:** Through a comprehensive analysis that delves into both the positive and negative dimensions of AI applications in the financial sector, this study provides a well-rounded and nuanced perspective. Such insights hold significance for stakeholders, including financial institutions and policymakers.
- **Region-Specific Insights:** Centered on the MENA region, this study illuminates the distinctive challenges and opportunities encountered by financial institutions in embracing AI applications. These insights perform duties as a foundation for connects tailored strategies, facilitating effective implementation, and fostering sustainable growth within the region.
- **Financial Professionals' Perspectives:** Empowering the perspectives of financial specialists in the MENA regional areas concerning the impact of AI applications on job roles, efficiency, and industry ambitious offers substantial insights into the practical implications of AI within the financial sector.
- **Contribution to Knowledge:** Addressing the identified research gap in the

existing literature, this study serves as a valuable resource for future academic and practical endeavors within AI, FinTech, and the financial sector in the MENA region and beyond.

- **Informing Decision-making:** The insights and recommendations generated from this research can support evidence-based decision-making for financial institutions, policymakers, and researchers interested in the development and adoption of AI and FinTech in the rapidly evolving MENA region.

1.5. Definitions

- **Financial Technology (FinTech):** The innovative cousin of traditional banking. It's where the financial world meets the latest tech, aiming to make financial services smoother and more user-friendly.
- **Artificial Intelligence (AI):** At its core, AI is like teaching machines to think and make decisions similarly to us humans. It's the magic behind your voice assistants, recommendation engines, and more.
- **Machine Learning (ML):** A subset of AI where computers evolve their actions based on the data they process.
- **Data Analytics:** Ever swam in a sea of data and looked for patterns or insights? That's data analytics. It's about diving deep into data, understanding its story, and making informed decisions from it.
- **Natural Language Processing (NLP):** This is all about getting computers to understand and respond to human language. It's why your voice assistant understands your song request or why some chatbots seem almost human.
- **Middle East and North Africa (MENA):** This term captures a diverse group of countries spanning two continents – from the historical lands of the Middle East to the vast terrains of North Africa.
- **Stakeholders:** Anyone from investors and customers to employees or even the local community.
- **Policy Analysis:** Picture this as dissecting rules and guidelines to see what's working and what isn't. It's about digging into policies, weighing their pros and cons, and suggesting better routes if necessary.
- **Knowledge-based Industries:** Brainpower takes the front seat. These industries thrive more on intellect and expertise than on tangible goods.

Chapter 2

Literature Review

2.1. Overview of AI

Since computers or rather machines were invented and deployed to the world, their abilities, and powers to perform and compute several different tasks have been growing exponentially. Scientists have been working hard to develop the power of computer systems on the basis of their diverse working environments or rather domains, their computational speed, their storage capacity, and their size (London, 2019). For instance, initially, computer systems were exceptionally huge; some of them could not fit in a single room. But today, one can carry a computer in a handbag or even a pocket. This is quite a huge improvement that cannot be overlooked.

Apart from reducing the size of a computer, scientists and computer engineers have managed to increase the functionality of computer systems. People are now developing computer systems that can reason and act as if they were human beings. In other words, scientists are equipping computer systems with AI. In principle, the creation of intelligent computer systems is pursued by a branch of computer science known as AI (Angelov, Soares, Jiang, Arnold, & Atkinson, 2021).

AI is one of the hottest fields in the world of technology now. In recent years, humans have witnessed several powerful innovations and advancements that were previously rooted in the realm of science rapidly transforming into reality (Angelov, Soares, Jiang, Arnold, & Atkinson, 2021). Consequently, AI is broadly inspired by the way the human brain works. AI systems are built to work almost the same way the biological nervous system works in the human body.

The biological brain is regarded as the controller of every move one can possibly make. It controls the way someone thinks, learns, decides, and even solves problems (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). Having studied the human brain, scientists became curious and started thinking and developing computing systems that could reason just like a human can.

We have seen that out of curiosity after seeing the increasing power of computer systems, humans started thinking about making the computer think too. Yes, that was quite impressive. But what was the goal of AI? Why spend a lot of

resources and time creating computer systems such as robots that can demonstrate some level of intelligence. Well, one of the goals of AI is to create expert systems. (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019)

Expert systems are those computer programs that use AI principles to simulate the behavior and judgment of humans or even an organization (London, 2019). Recently, we have had the privilege of using several chatbots. These are just computer programs that try to simulate how humans respond to one another while chatting. A good example of these systems is Google assistant which can actually help you perform some of your phone operations.

The other goal of AI, which is obvious, was to implement human intelligence in machines. Today, computers have become more powerful in terms of processing speed and even storage capacity (Angelov, Soares, Jiang, Arnold, & Atkinson, 2021). This means that we can use computer machines to do more than traditional computational activities. One of the ways in which we can make computer systems more useful to our lives is by making them learn how to reason and perform duties like humans. For example, robots are now quite common, and they are used for various purposes. Some use robots in the manufacturing industries to perform casual work while others use these robots in the medical sector. These robots and automotives are specifically coded and programmed to assimilate their primary tasks in the work area, starting their performance once they have learned them precisely.

2.1.1 AI in the MENA region. The actively contributing of AI to addressing challenges in the region, including mitigating water scarcity, enhancing its energy efficiency, and boosting agricultural productivity (London, 2019). However, concerns surrounding data privacy, cybersecurity, safety, and job displacement persist. Ongoing dialogue and collaboration among governments, businesses, and researchers are assertive to realize the benefits of AI and its environment while effectively addressing these challenges. (Dukakis, 2020)

2.1.2 How AI is perceived in the MENA region. In the MENA area, AI is generally running as a promising technological innovation with having power to yield benefits across various industries and other sectors (London, 2019). Increased acknowledgment of AI's power is centered on its ability to escalate its creativity productivity, efficiency, and innovation. Furthermore, there is a recognition and elevation of its ability to set key challenges in the regional area, including reducing water scarcity, enhancing energy efficiency, agricultural productivity, and development.

Thus, there are detailed oriented environments regarding the powerful risks and unintended consequences, minds associated with AI, including issues like job discernment and privacy violations. (Gaudio, Faloutsos, Smailagic, & Costa, 2022). These processes have spurred heightened debate and dialogue regarding the behavior of AI, emphasizing the necessity for a responsible and inclusively high approach to both its development and deployment.

Generally speaking, AI is perceived as a double-edged sword, emphasizing the imperative for continuous dialogue and collaboration among governments, businesses, and researchers. This collaborative effort is essential to ensure the realization of AI benefits while effectively addressing its potential risks and challenges.

2.1.3 Are employees in the MENA regions happy with AI features? Creating a detailed statement about employee attitudes towards AI in the MENA region proves challenging, given the conscious variation influenced by deep factors such as industry type, specific AI applications, its uses, and individual employee roles abilities and experiences.

Broadly, employees in industries leveraging AI to automate representative or module tasks tend to be supportive of the innovation. This is because it liberates their time, enabling them to concentrate on more creative and value-adding activities (Sangwan, Harshita, Prakash, & S, Financial Technology: A Review of Extant Literature, 2019). Conversely, employees who perceive AI as a potential threat to their job security may exhibit less support for the technology.

It's crucial to acknowledge that the incorporation of AI in the workplace can profoundly affect employees. Employers must prioritize effective and transparent communication regarding the benefits and risks of the technology. Additionally,

providing support to employees in adapting to the changes introduced by AI is essential (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). This includes providing training, working, and development opportunities to help employees require the skills needed to thrive in the AI-powered workplace of the future.

In conclusion, employee attitudes towards AI in the MENA region are likely to be influenced by several factors and may vary widely depending on individual circumstances.

2.1.4 What contributes to AI? AI is a scientific and technological innovation that is based on disciplines such as CS, biology, psychology, linguistics, mathematics, and even engineering. A great milestone in AI is the development and progress of computer program functionalities that were associated with the human brain. This began with the development of the perceptron (England & Cheng, 2018). The following diagrams show a perceptron:

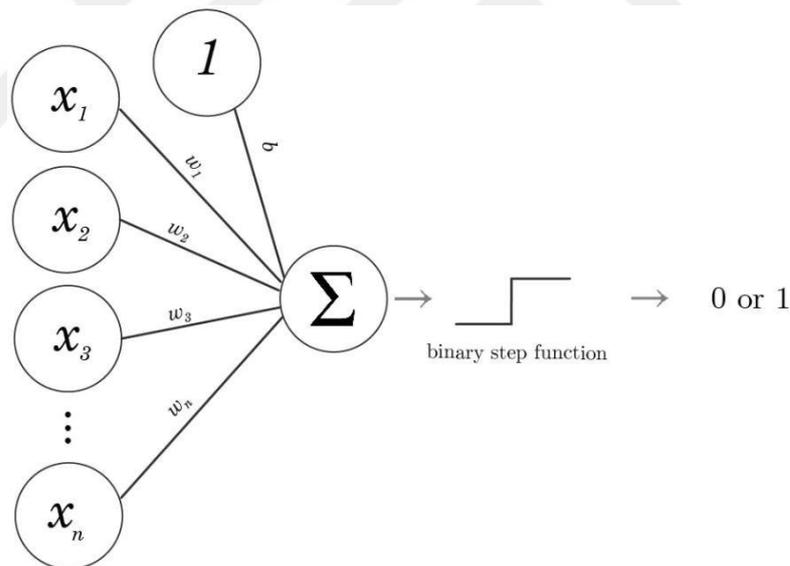


Figure 1. Perceptron Model

(Rosenblatt, 1958)

A perceptron is a single-layer neural network that is mainly regarded as one of the very first algorithms for supervised models (Kim, Jang, Kim, Shin, & Park, 2019). The diagram below shows some of the areas that contribute to the development of intelligent computer systems.

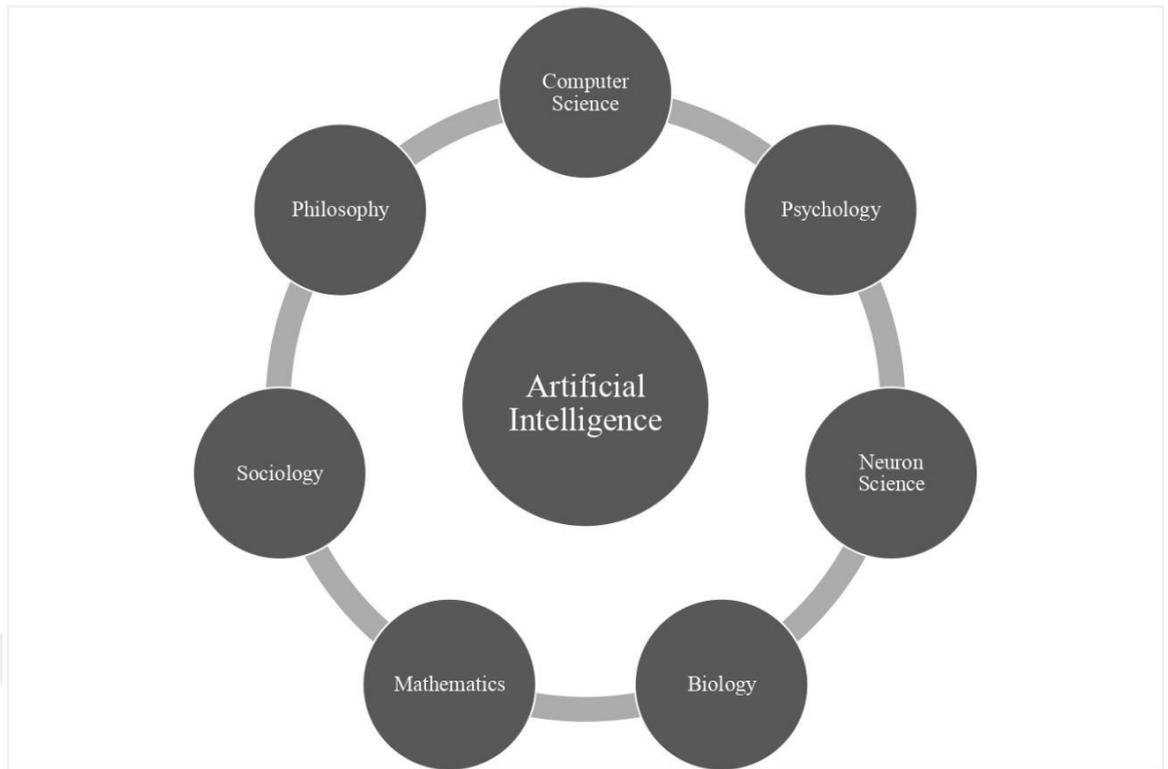


Figure 2. AI and its Applications in Various Disciplines

(T, Arumugam, Pandurangan, & Panjaiyan, 2023)

2.2 AI: Past, Present, and Future

In recent years, AI has grown tremendously allowing various computer systems such as robots to think and behave like human beings. Furthermore, many Information Technology (IT) firms all over the world have been attracted by AI systems. (Vincent, 2020). AI is being viewed as the second major technological revolution after the growth of mobile and cloud platforms.

Many people have already gone ahead to dub AI as the 4th industrial revolution (Vincent, 2020). One of the reasons for its rapid growth is its miraculous ways of solving problems. Some brilliant researchers have already created AI algorithms that are inclined to the theories of great scientists such as Darwin. One of the most famous theories by Darwin is the survival of the fittest theory. AI has already placed its foot in this area, and it is used to create systems that improve from one generation to the other without the need for human intervention.

In this section, we will dive deep into the history and evolution of AI. We will look at how AI was during its conception. Furthermore, we will dig deep into the current practices of AI in the world (Nawaz, 2019). Here, we will talk about how

AI is used to shape the world today. Lastly, we will discuss the prospects and the future of AI.

2.2.1 History of AI. The roots of Artificial Intelligence can be tracked back to the 1950s when researchers initially delved into the concept of developing machines with the capacity to think and reason akin to humans (London, 2019). In 1956, a gathering of scientists and scholars convened at Dartmouth College to contemplate the prospect of constructing "thinking machines." This conference is widely recognized as the seminal moment marking the birth of AI as a distinct field of study.

During the initial years of AI research, the emphasis was on crafting straightforward rule-based systems capable of executing particular tasks, like playing chess or solving mathematical problems (Vincent, 2020). Nevertheless, these early AI systems were constrained in their capabilities and encountered challenges when attempting to handle more intricate tasks.

During the 1980s and 1990s, strides in computer hardware and the formulation of new algorithms empowered AI researchers to achieve noteworthy advancements (Confalonieri, Coba, & Wagne, 2020). Expert systems, created to emulate the decision-making processes of human experts, gained popularity across various industries during this period, including healthcare and finance.

2.2.2 AI research today. Today, AI research is continuing to develop and widen its scope. Many studies show that the growth and improvement rate of AI research in the world in the previous five years is about 12.9% every year (Confalonieri, Coba, & Wagne, 2020). Consequently, many countries have been competing in AI research with China being predicted to possibly surpass the United States of America and become the world's top producer of AI technology in the coming years.

Additionally, in terms of AI development, Europe has taken the lead since it has many countries that have actively ventured into the technology (Gherhes, Yu, Vorley, & Xue, 2023). Elsewhere, India grabs a third place in terms of AI technology and has proved to be one of the countries to have many tech-savvy individuals

2.2.3 AI in the present day. AI has made importance factual progress in recent years and has become increasingly prevalent in many aspects of modern life (Confalonieri, Coba, & Wagne, 2020). Today, ML is used in a wide range of uses, including:

- Image and speech recognition: AI algorithms can accurately identify objects and people in images and transcribe speech into text, enabling the development of products such as smart speakers and image-based search engines.
- Natural Language Processing (NLP): AI algorithms can process and learn human language, which has led to the development of virtual assistants such as Siri and Alexa, as well as chatbots used in customer service. These virtual assistants have made the use of various computer systems become enjoyable and quite easy (Zaremba & Demir, 2023). For example, one can command google virtual assistant to make a google search for him. Apart from making the use of phones enjoyable, these assistants reduce the cost of operations for the owners of these technologies since one virtual assistant can serve more clients compared to physical customer care assistants.
- Healthcare: AI is being used by it to improve medical diagnosis, drug discovery, and personalized treatment plans. Also, we have witnessed very critical medical operations such as surgeries being conducted by robots (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). The use of AI technology in such operations has reduced human error by a great percentage. The following diagram shows an AI system working in the medical field to



perform

surgical

operations:

- Autonomous systems: AI is actively employed in the progress of self-driving cars, drones, and robots, harboring the potential to revolutionize the way we lead our lives and engage in work sites. (Lau & Haugh, 2018)
- Finance: AI is applied in the financial industry to identify fraud, assess credit risk, and automate trading decisions.
- Customer service: AI chatbots are being utilized to deliver prompt and efficient customer service, streamlining queue processes, and enhancing overall customer experience.
- E-commerce: AI is employed to personalize shopping recommendations, thereby enhancing the customer experience.
- Despite the myriad benefits of AI, concerns persist regarding its societal impact, encompassing issues like job displacement and the potential for malicious use of AI systems (London, 2019). In addition to these concerns, many countries are formulating behavioral guidelines and regulations to ensure the responsible use of AI for the advantages of humanity.

2.2.4 AI in the future. The future of AI is more advancing to divine, due to it is self-assured to imagine an even more controllable role in shaping our world (Emmert-Streib, Yang, Feng, Tripathi, & Dehmer, 2020). Here are some potential future innovations in AI:

- General AI: At present, AI supreme at presuming specific works, yet it under the versatility to run a diverse environment and its column of activities as humans can (Gaudio, Faloutsos, Smailagic, & Costa, 2022). In the future, researchers and scientists might update the general AI systems with the ability to run multiple works, potentially ushering in significant developments in the fields such as healthcare and finance department.
- Human-level intelligence: Certain researchers and individuals hold the belief that AI will ultimately attain human-level intelligence, enabling machines to over-power and interact with the world in a mannered environment from humans.
- Augmented human intelligence: AI has the potential to augment human intelligence, enabling us to think faster, make better decisions, and solve

problems more effectively.

- Autonomous systems: AI-powered autonomous systems, including self-driving cars, drones, and robots, are anticipated to become more advanced and widespread, potentially revolutionizing the way we live and work.
- Personalized experiences: AI is assumed to persist in its use for personalizing experiences, ensuring, and encompassing aspects like delivering tailored recommendations, enhancing customer service, reliability and crafting customized products for their consumers.
- Intelligent environments: AI-driven smart homes, cities, and workplaces are expected to become more prevalent, potentially fostering more efficient, sustainable, and convenient living environments.
- Ethical concerns: As AI advances, it is probable that ethical and societal concerns will persist, giving rise to issues related to privacy, security, and job displacement. It will be significant to ensure that AI is developed and used in a responsible manner.

Overall, the future of AI is uncertain, but it is likely to be a major driving force in shaping our world in the coming decades (Confalonieri, Coba, & Wagne, 2020). As AI continues to evolve, it will be important to consider and address the potential risks and ethical implications associated with its development and use.

2.3 Limitations of AI

To perform some AI-powered marketing jobs, one can only use unique solutions currently in the development of AI (Gaudio, Faloutsos, Smailagic, & Costa, 2022). There are several intelligent marketing options accessible, from employing AI to customize and improve your content to an AI tool that aids in the optimization of paid advertising. It can be expensive, time-consuming, and tricky to use a range of different instruments to carry out a variety of artificially intelligent operations because there is no universally applicable solution. Here are some of the demerits of AI.

2.3.1 AI systems require close monitoring. Just like an engine, updated algorithms work, but a key significance must still be turned. To plan, create, and carry out the marketing campaign, the marketer and dealers is still essentially significant. They provide the AI that is important for learning in the first place with new data (Gaudio, Faloutsos, Smailagic, & Costa, 2022). According to research, the fact that this kind of supervised learning does not mimic how people naturally learn presents one of the biggest hardships in creating a ML that is also like humans.

2.3.2 Most Artificial Intelligent systems are limited to pre-fed tasks. AI can only complete the tasks that have been assigned to it. While it frequently succeeds in doing so rather successfully, unlike a human being, it is unable to make split-second decisions (Emmert-Streib, Yang, Feng, Tripathi, & Dehmer, 2020). For instance, when a disastrous event occurs, a skilled marketer will change or stop any planned messaging. So that as people, we can have empathy and sympathy for the victims and their families. However, since a computer is unemotional, if it is not strictly controlled, it might get a company into difficulty in a time of crisis.

2.3.3 Installation and maintenance costs are extremely high. Just like any new modification and its technology, there might be a sizable starting investment as well as continuous maintenance, stable, and repair needs (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). Your ML software must undergo regular upgrades to keep up with the changing business environment. Your company should thoroughly assess the return on investment before using any technology of ML or AI.

2.3.4 AI hinders creativity. Let's examine this from a marketing perspective. Creativity and innovative concepts are essential to successful marketing because they help marketers keep one step ahead of the competition (Emmert-Streib, Yang, Feng, Tripathi, & Dehmer, 2020). Machines and AI, on the other hand, are limited by a lack of creativity.

Humans, in general, can think and feel, which ultimately influences their decision- making regarding creativity. Although machine learning AI aids in finding picture types that, for example, have a higher likelihood of a consumer clicking on them, it lacks originality and creativity. As a result, a machine cannot match human brains in terms of uniqueness and originality. (Tang, Shen, Zhao, Li, & Liu, 2023)

2.3.5 The use of AI systems has suffered a lack of privacy, safety, and even ethics. There's no agreement on safety, ethics, or privacy. The limitations of AI application cases still need further consideration and discretion (Gaudio, Faloutsos, Smailagic, & Costa, 2022). AI safety is critical given the existing limitations, and immediate action is needed. The majority of AI critics also raise ethical questions regarding its use, both from a philosophical and an ethical perspective, given how it compromises privacy. We believe that human intellect is unique and intrinsic. It might not make sense to give up such exclusivity.

One of the most fundamental contested issues is whether or not robots should be given basic and simplest rights if they are fundamentally equivalent to the people and can accomplish all things that humans can (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). If yes, how would you be describing these robots' rights? As of right present, such situations have no definitive answers. Since AI has only recently been developed, research on AI ethics is still in its infancy.

2.3.6 AI suffers from adversarial attacks. AI, in contrast to humans, is unable to adjust to changes in a wide range of circumstances, factors and applications. An autonomous vehicle may deviate into the wrong lane and crash if tape is only placed on the incorrect side of the road (Confalonieri, Coba, & Wagne, 2020). As a result, someone can overlook the video or not react at all. While autonomous vehicles are secure in some scenarios, it is concerning that these kinds of circumstances don't inspire trust in them.

This minimum log highlights unresolved security issues by highlighting its inadequacies. While occasionally "tricking" these quantitative data models and structures can be amusing and secure e.g., confusing a toaster for a banana, in urgent situations e.g., defense objectives, it could risk lives.

2.4 The Rise of FinTech

The financial and aid services of the industry have more and testified significantly in terms of innovation and technology during the last ten years. Technology has escalated the number of services moving to digital platforms (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). Today, AI and updated algorithms fuel a wide range of services, key factors, including robo-advisors that encourage customers to adopt better financial practices and analytics that assist in more wisely using their nest egg.

Even if this era, which I refer to as FinTech 2.0, has greatly helped people everywhere by enabling them to participate in the digital economy and enhance their financial well-being, most of the innovation we have seen thus far has been incremental (Sangwan, Harshita, Prakash, & S, Financial Technology: A Review of Extant Literature, 2019) As a result, they have paid more attention to the "tech" than the "fin" side of the home. FinTech 2.0 primarily repackages, understanding its financial services and aids in order to improve their usability, such as by adding a behavioral economics component, or functionality, such as by combining a previously divided service into a continuous flow.

Please understand that there are exceptions, realities, and imaginations. Many “digitally native” finance businesses have done well in achieving their objectives, sendups and successfully disrupting established competitors (Sangwan, Harshita, Prakash, & S, Financial Technology: A Review of Extant Literature, 2019). For example, a few smart companies found that non-financial data could be used to estimate client risk more precisely than previous financial data, allowing big FI and transforming credit rating globally.

2.4.1 The evolution of FinTech. The evolution FinTech, can be traced back to the introduction of ATMs and the computerization of banks in the 1960s and 1970s (Hua, Huang, & Zheng, 2019). However, it wasn't until the rise of the internet and mobile technology in the 2000s that FinTech truly began to gain momentum. Early 2000s, the advancement of internet banking and the development in electronics set the groundwork for the success of FinTech. The establishment of PayPal in 1998 enable secure online money transfers, ultimately playing an important role in the growth of Peer to Peer (P2P) payment platforms (Caciatori Junior & Szabo Che, 2020). In 2010s, the widespread use of mobile technology and the adoption of smartphones and tablets played an important role in the growth of mobile banking and the development of new FinTech services. Innovations like digital wallets, mobile payments, and robo-advisory services transformed how people set their finances. Anymore, the crowdfunding and P2P lending polices merged, providing alternative funding options for individuals and small businesses.

Currently, FinTech continues to undergo the advancement and diversification, venturing into new domains such as blockchain, AI, and the Internet of Things (Sangwan, Harshita, Prakash, & S, Financial Technology: A Review of

Extant Literature, 2019). These technologies have the potential to transform the financial services industry by improving security, cutting costs, and spreading access to financial services world widely. The overall motivative of FinTech has prompted key shifts in the financial department, challenging conventional entities while simultaneously opening up new prospects for innovation and technologies.

2.4.2 AI in the finance industry. AI plays a key and significant role in the finance industry, embracing how financial services are delivered and drawn. The power of AI technology lies in its ability to improve efficiency, reduce costs, and enhance the overall process (London, 2019). Some of the most prevalent uses of AI in finance include:

- Fraud detection: The systems powered by AI can analyse various fields and volumes of data in real time, setting the encryption identification and prevention of fraudulent transactions.
- Customer service: AI-powered virtual assistants and chatbots can deliver prompt and personalized responses to consumer inquiries, effectively alleviating the workload on customer check over teams.
- Risk management: AI with the ability to analyze financial information and market trends, aiding financial institutions in making well-informed investments and effectively perform risk management.
- Credit scoring: AI has the ability to analyze large masses of data to assess creditworthiness, giving a more accurate and efficient method for evaluating loan uses.
- Managing personal finances: AI-driven robo-advisors can provide customized investment suggestions, assisting individuals in better overseeing their financial affairs.

AI is still in its stages of adoption within the finance department, its potential to revolutionize the areas is considerable. The key role is anticipated to escalate importantly as financial institutions exploit avenues to enhance their services and stay competitive in an ever-changing landscape order.

2.4.3 FinTech trends, limitations, and opportunities. FinTech is a swiftly evolving industry, witnessing the regular emergence of new trends and innovations (Sangwan, Harshita, Prakash, & S, Financial Technology: A Review of Extant Literature, 2019).

2.4.3.1 Some of the current and emerging trends in FinTech include.

- Open banking: This trend involves the growing collaboration and sharing of financial data information among banks, FinTech companies, and other financial services providers. The goal is to improve financial services and empower consumers by giving them greater control over their data.
- Digital wallets: The significance of digital wallets is on the rise, extracted by an escalating number of people using their smartphones and other devices to manage their finances (Sangwan, Harshita, Prakash, & S, Financial Technology: A Review of Extant Literature, 2019). The likelihood of this trend assisting is expected to expand as mobile payments become increasingly prevalent and safe.
- Neo-banking: As the recent advances of emerging category of digital banks, neo-banks give a diverse array of financial orders, spanning savings accounts to investment profiles, all without the presence of physical branches. Generally oriented towards the younger, technologically adept demographic, these banks are premeditatedly crafted to be user-friendly and easily accessible.
- Insurtech: The current movement entails leveraging technology to enhance various facets of the insurance industry, ranging from the acquisition of policies to streamlining the claims process. Insurtech startups are striving to enhance accessibility, affordability, and efficiency in the insurance landscape through innovative technological solutions. (Poshtiri, Soleimani, Delafrooz, & Shahroudi, 2023)
- Blockchain: The blockchain technology within the financial department is scattering, embracing diverse environments such as ensuring secure digital transactions and even giving rise to digital currencies.
- AI: Artificial Intelligence is on the rise in the financial department, where its uses span from detecting fraud to providing personalized advice. AI technology holds the potential to modify the efficiency and precision of financial orders, concurrently leading to cost minimization.

These represent only a subset of the trends molding the future landscape of

the financial services industry. With the ongoing evolution of technology, it is probable that fresh trends will surface, and existing ones will undergo further developments. The FinTech sector remains in a perpetual state of evolution, underscoring the importance for financial institutions to stay abreast of the latest trends and innovations.

2.4.3.2 Limitations of fintech. *FinTech* has transformed the delivery and consumption of financial services, yet it is not exempt from limitations (Caciatori Junior & Szabo Che, 2020). Some of the limitations of *FinTech* are as follows:

- **Regulation:** Operating within a highly regulated industry, FinTech companies encounter challenges in adhering to regulations. In certain instances, regulatory compliance can impede the rapid pace of innovation and curtail the expansion of FinTech firms.
- **Cybersecurity:** As concern of online financial transactions increases, the vulnerability to cyber-attacks also increases. FinTech companies must prioritize the security and safety of their systems and data to safeguard consumers sensitive information.
- **Lack of trust:** Along with the advantages offered by FinTech, there remains a segment of the people strength that may exhibit hesitancy in advances of new technologies and services (Hua, Huang, & Zheng, 2019). Presenting trust with customers is paramount for the updating of FinTech companies, particularly within the financial department industry.
- **Technical limitations:** FinTech, being innovative, is receptive to service disruptions and erosion of consumers' trust because technical failures or glitches. To mitigate such mistakes, FinTech companies must invest in time and dependable systems.
- **Social exclusion:** The FinTech grip the power to escalate the access to financial order for those underserved by traditional institutions, its implementation, if not thoughtful, could lead to social exclusion by marginalizing individuals without access to innovation or digital financial department.
- **Privacy concerns:** The enforcement and utilization of consumer data by FinTech companies may promote privacy concerns. It is imperative for FinTech entities to maintain transparency regarding the use of consumer data

and implement measures to safeguard customer services.

In essence, by enhancing the adaptive financial services, orders and expanding world widely, it is important to acknowledge these limitations, drawbacks and actively work towards minimizing their impact.

2.4.3.3 Advantages and opportunities of fintech. *FinTech* has effectively transformed and molded the financial services industry, presenting numerous advantages and opportunities, including:

- Improved customer experience: FinTech furnishes consumers with convenient, swift, and personalized financial services accessible through their smartphones and various other mobile devices (Caciatori Junior & Szabo Che, 2020). The enhanced customer experience is instrumental in attracting new customers and retaining existing ones.
- Increased competition: FinTech companies are disrupting the conventional financial services industry through innovative and competitive offerings. The more raise competition is driving to reduce prices and improved services for customers.
- Increased financial inclusion: FinTech grips the power to escalate access to financial order and services for people traditionally underserved by conventional financial institutions, including those residing in rural areas or with the incomes.
- Improved efficiency: FinTech has the ability to automate many manual processes, thereby reducing the time and costs associated with delivering financial services and order (London, 2019). The more efficiency facilitated by FinTech can result in more reduced costs for consumers and augmented to earn profits for financial institutions.
- Enhanced security: Employing recent advanced innovations and technologies like blockchain and biometrics, FinTech companies bolster the safety and security of financial transactions, safeguarding consumers' sensitive financial information.
- Innovation: FinTech is a dynamic and innovative industry that consistently explores novel avenues to enhance financial services and adapt to evolving customer needs. This perpetual innovation often results in the creation of new and improved financial products and services.

Basically, the ascent of FinTech is encouraging opportunities for businesses, consumers, and the overall economic efficiency (Hua, Huang, & Zheng, 2019). The

current period is exhilarating for the financial services industry, and it will be intriguing to witness the ongoing evolution of FinTech and its impact on shaping the future of financial services.

2.5 Overview of the Financial Sector in the MENA Region

The financial sector in the MENA region is distinguished by diverse and rapidly expanding economies, substantial levels of oil wealth, and the emergence of a growing middle class (Sangwan, Harshita, Prakash, & S, *Financial Technology: A Review of Extant Literature*, 2019). Nevertheless, the sector is also marked by notable regional and geopolitical risks, along with limited banking and financial infrastructure in certain countries.

Furthermore, by using this technology, the stock markets in the region are undergoing more developed, with many countries initiating the initiatives to modernize and empower the depth of their capital core markets (London, 2019). As a result, the recent trend has witnessed an up in the cross-border mergers and acquisitions specific activity, mirroring the escalating integration of the economies within the specific regional area.

In conclusion, the financial department in the MENA regional area is undergoing a converted spurred by the imperative to diversify economies away from reliance on oil and address the escalating financial acquirments of a rapidly expanding population (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). However, the regional areas still grasp the double substantial challenges, embracing political instability, restricted regulatory frameworks, and a deficiency in visual transparency.

2.5.1 AI in the financial industry in the MENA region. The adoption of AI in the financial company within the MENA region is on the upswing, as an increasing number of financial institutions are bring embraced by AI technologies to augment operational efficiency, cut costs, and enhance the overall customer experience (Emmert-Streib, Yang, Feng, Tripathi, & Dehmer, 2020).

AI applications in the financial departments in the MENA regional areas encompass fraud detection, loan underwriting, risk management, customer service, and wealth management (Angelov, Soares, Jiang, Arnold, & Atkinson, 2021). For samples, the integration of AI in fraud detection is more assisting financial

institutions and departments in swiftly identifying and preventing fraudulent activities, thereby mitigating the risk of financial losses.

The affiliation alliances of AI in the financial departments and specific areas in the MENA region is still in its nascent stages, and several challenges must be addressed, including the scarcity of a skilled workforce, concerns regarding data and information privacy, and the imperative for robust regulatory frameworks (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019).

Nevertheless, the potentially based power the benefits of AI in the financial sector are substantial, and there is an exception that the departmental sectors will persist in investing and earning in AI technology to empower operational efficiency, cut costs, and increased the customer and consumer experience. The increasing adoption of AI in the financial department in the MENA region is poised to stimulate empowered competition, foster innovation, and speed up the development of new financial order, products, and services.

2.5.2 AI applications and opportunities in the financial sector in the MENA regional areas.

2.5.2.1 Applications of AI in the financial sector. The financial department in the MENA regional areas is increasingly embracing AI technology to empower operational efficiency, mitigate costs, and elevate the overall consumers i.e., costumers experience (Holzinger, Langs, Denk, Zatloukal, & Müller, 2019). The following are some of the various uses of AI in the financial department in the MENA regional areas:

- **Fraud Detection:** AI algorithms play a key and significant role in recognizing fraudulent transactions and detecting unusual and unethical behavior, setting up financial institutions to swiftly recognize, analyze and prevent fraudulent activities.
- **Loan Underwriting:** AI algorithms can examine the intensive and extensive datasets to facilitate quicker and more precise loan underwriting, thereby diminishing the time and cost, so that it should be associated with the loan approval process.
- **Risk Management:** AI can assist financial institutions in analyzing massive data based sets to pinpoint potential and powerful risks, enabling protective shields towards management of risk exposure (Emmert-Streib et al., 2020).
- **Customer Service:** AI chatbots can deliver more efficient consumer service,

alleviating the workload on human customer service agents and enhancing the overall customer experience and empowering it.

- **Wealth Management:** AI algorithms, by analyzing extensive data sets, can offer popularized investment and earning business advice, contributing to an empowered consumer experience and increased its efficiency in wealth management services.
- **Trading and Algorithmic Trading:** AI algorithms, with their least ability to analyze intensive and extensive datasets, can recognize lucrative trading opportunities, aiding financial institutions in achieving improved earnings.
- **Predictive Analytics:** AI algorithms are more able of analyzing and examining extensive and intensive datasets, can recognize trends and make predictions, empowering financial departments and institutions to make more effective and informed decisions.

2.5.2.2 Advantages and opportunities of fintech in the MENA regional area. FinTech is upgoing a transmitted focus on the financial department in the MENA regional area, presenting a visual spectrum of opportunities and advantages for consumers, businesses, and financial institutions alike (Hua, Huang, & Zheng, 2019). The following includes some of the pros and opportunities of FinTech in the MENA region:

- **Escalated Access to Financial Services:** FinTech firms are converting and introducing innovative financial orders and services that are both accessible and affordable, mainly catering to people who may be supervised by financial institutions. (Imerman & Fabozzi, 2020)
- **Improved Customer Experience:** With the recent advanced technology, FinTech firms are delivering swift, more useful, and personalized financial services to consumers, thereby increasing the overall consumer experience. (Mirchandani, Gupta, & Ndiweni, 2020)
- **Lower Costs:** By using vast technology, FinTech companies are actively lowering the cost of delivering financial services and orders, rendering them more affordable for both consumers and businesses.
- **Increased Competition:** The ascent of FinTech companies is heightening competition in the financial department, resulting in improved products, services, and pricing options for both consumers and businesses.
- **Improved Financial Inclusion:** FinTech is distributing the enhancement of

financial inclusion in the areas by expanding financial orders to people and entities previously excluded from the financial department, including low-income households and small businesses.

Certainly, it can be believed on that FinTech is reshaping the financial department in the MENA regional area, presenting a diverse array of environment and pros for consumers, businesses, and financial institutions (Vincent, 2020). Anticipated growth in the FinTech sector is poised to establish heightened competition, spur innovation, and enhance financial orders across the region.

2.5.2.3 Examples of fintech firms in the MENA region. The *FinTech* department in the MENA regional area is undergoing quick expansion, marked by an escalating number of innovative firms providing financial products and services to both consumers and businesses (Nawaz, 2019). Here are a few samples of *FinTech* firms in the MENA region:

- PayFort: A prominent online payment sector in the MENA regional area, offering online payment services to retailers and businesses.
- Souqalmal: A difference on the website specializing in financial products, embracing credit cards, insurance, loans, and savings accounts. It allows consumers to compare and select the most useful financial products for their needs.
- STC Pay: A digital wallet and payment principle provided by Saudi Telecom Company, enabling consumers to do payments, money transfer, and pay bills quickly by a mobile app.
- Beehive: A P2P lending policy facilitating the connection between investors and borrowers, allowing the investment in Small and Medium-Sized Enterprises (SMEs) within the MENA regional area.
- The National Bank of Ras Al-Khaimah: A digital bank depends on the United Arab Emirates, providing a variety of financial products and services by a mobile app, having savings accounts, personal loans, and investment products.
- Tabby: A mobile app-based platform providing a lot of financial services, embracing invoicing, payment processing, and business financing customized for Small and Medium Enterprises (SMEs) in the MENA regional areas.

These are just a few examples of the growing number of innovative FinTech companies in the MENA region, offering a range of financial products and services to consumers and businesses (Vincent, 2020). The sustained growth of the FinTech

sector in the MENA region is expected to bring increased competition, innovation, and improved financial services to the region.

Conclusion

In conclusion, we can contentedly say that AI has had great success in the recent past. Its impact on the world cannot be overlooked. As a result of AI, now many everyday jobs in manufacturing companies are completed very accurately by robots (Nawaz, 2019). Although one can say that AI has led to unemployment by overcoming traditionalism. The truth will still be that robots exist to complement us, not entirely replace us.



Chapter 3

Methodology

3.1 Research Design

Our quantitative research design consists of one primary component: an online survey involving a questionnaire developed by (Hentzen, Hoffmann, & Dolan, 2022) and (Kelly, Kaye, & Oviedo-Trespacios, 2023) with scalable answers. The survey targeted individuals in the financial workforce within the region, featuring a combination of closed-ended and open-ended questions. This approach enabled the collection of quantitative data concerning participants' utilization of AI and their perceptions of its efficacy. The survey was disseminated online through diverse environments, social media platforms, renders and email lists.

The exclusive use of quantitative data provided a focused and detail-oriented understanding of the topic. Relying on this single method, with its emphasis on measurable and statistical analysis, contributed to the study's rigor and validity. The careful selection of a purposive sample and the systematic analysis of the quantitative data ensured precise and reliable findings, demonstrating the effectiveness of using a singular, numerical approach in research.

3.2 Research Model

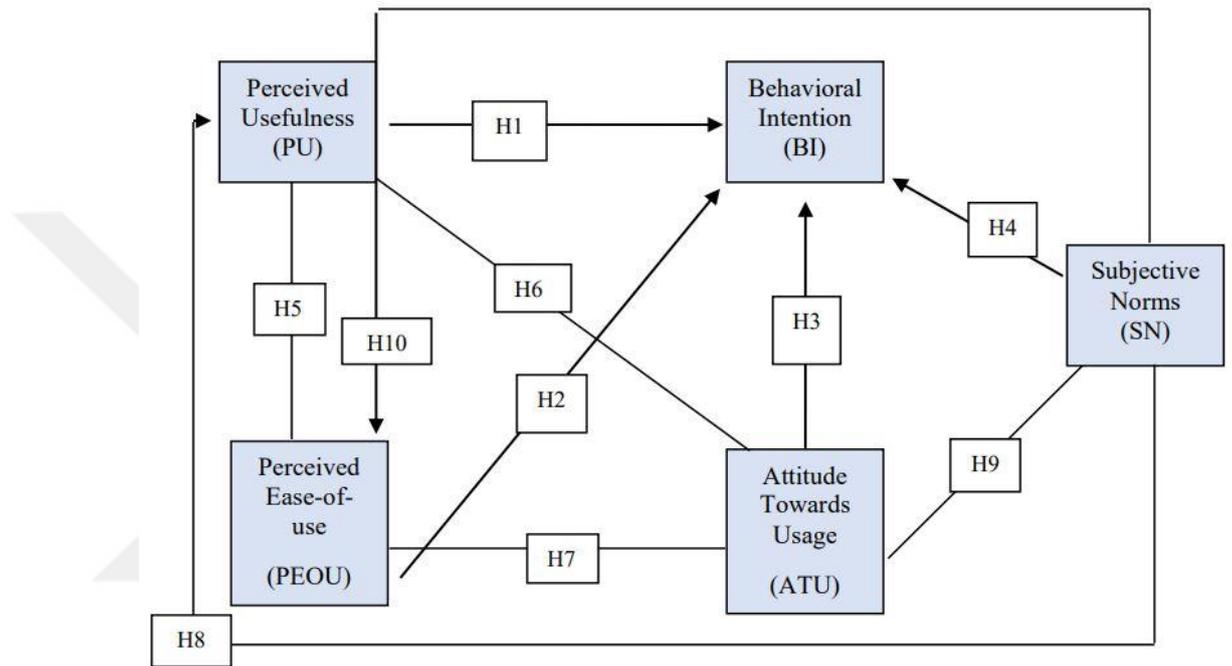


Figure 3. Research Model

The following research hypotheses are proposed in this study:

H1: Perceived Usefulness (PU) has a positive effect on behavioral intentions (BI).

H2: Perceived ease of use (PEoU) has a positive effect on behavioral intentions (BI).

H3: Attitude towards usage of AI tools (ATU) has a positive effect on behavioral intentions (BI).

H4: Subjective norms (SN) have a positive effect on behavioral intentions (BI).

H5: Perceived ease of use (PEoU) has a positive effect on perceived usefulness (PU).

H6: Perceived usefulness (PU) has a positive effect on attitude towards usage of AI tools (ATU).

H7: Perceived ease of use (PEoU) has a positive effect on attitude towards usage of AI tools (ATU).

H8: Subjective norms (SN) have a positive effect on perceived usefulness (PU).

H9: Subjective norms (SN) have a positive effect on Attitude towards AI use (ATU).

H10: Subjective norms (SN) have a positive effect on Perceived ease of use (PEoU).

H11: A higher level of perceived usefulness (PU) is positively related to firm innovativeness (FI).

H12: A higher level of perceived ease of use (PEoU) is positively related to firm innovativeness (FI).

H13: A positive attitude towards usage of AI tools (ATU) is positively related to firm innovativeness (FI).

H14: There is a positive relationship between subjective norms (SN) and firm innovativeness (FI).

3.3 Sample and Population

The population of this study is the MENA region's Financial Sector. We have a dataset comprising responses from 315 financial experts, which is the sample of this study. The information encompasses diverse aspects, including age, gender, education level, size of the institution they work at, annual revenue of the institution relative to industry norms, assessment of the institution's profitability compared to industry standards, and the ranking of AI tool adoption in their institution's operations. With no missing data, the dataset appears robust for drawing insights. The data set's breadth allows for a comprehensive understanding of the workforce, institutional characteristics, financial performance, and the integration of AI technologies.

The selection of the MENA region as our target was motivated by its rapid growth in the financial industry and the increasing adoption of AI technologies. Our goal was to secure a diverse sample to capture a broad spectrum of perspectives and experiences related to the effectiveness of AI in the financial sector. Additionally, we focused on our sample to be representative of the broader population of interest.

To fulfill this objective, we empowered the purposive sampling to choose participants. We extensively identified individuals with diverse based environment and job roles in the financial sector, encompassing managers, executives, and employees in various departments such as marketing, risk management, and operations. Additionally, we make sure that the inclusion of requirement individuals with non-constant years of experience in the financial firmly industry, ranging from recent entrainments to those with over ten years of experience and skilled abilities.

3.4 Procedures

As previously stated, an online survey was conducted in the data collecting process. Closed-ended questions on participants' exposure to AI technology, opinions on the usefulness of AI in the financial industry, and demographic data made up the poll.

In order to consider participants' language preferences, the survey was given online or offline physical using a platform that offered both English and Arabic versions. The survey was designed to take twenty minutes to complete so that selection will be easy and perfect. To make sure the questions and assessments were understandable and clear vision, a small sample of participants took part in a pilot test. The survey data was then extracted from the web platform and subjected to statistical software analysis data.

Several steps were taken to maintain the caliber and standard of the information gathered from the survey. Skipping logic and focus check questions were included in the survey to reduce answer bias and improve data accuracy and efficient response. The main objective was to collect high-quality data that would make it easier to respond to researchers and their questions and reach reliable judgments about the application of AI in the MENA financial departmental sectors.

3.4.1 Data collection instruments. We employed a survey questionnaire that incorporated Likert-type scales and multiple-choice questions. The survey questions were developed through a review of the literature on the effectiveness of AI in the financial sector and underwent pilot testing with a sample of 20 participants. The survey questionnaire assessed employees' agreement levels regarding the adoption of AI tools within the financial sector. It comprised nine demographic questions and utilized a five-point Likert scale for 22 items, distancing from one (strongly disagree) five (strongly agree).

The questions were derived from a comprehensive review of existing literature by (Davis, Bagozzi, & Warshaw, 1989) and (Venkatesh, Morris, Davis, & Davis, 2003) on the topic and underwent pilot testing to ascertain clarity and understandability.

3.4.2 Data collection procedures. To assure quality test and reduce bias, a number of procedures and individuals were put in place during the data gathering process. This involved giving participants simple, unambiguous instructions on how to complete the given survey. The goal of maintaining participant anonymity was to encourage truthful and accurate answers without worrying about the consequences.

Additionally, before beginning the analysis, we carefully checked the data to make sure it was accurate and comprehensive. Complete questionnaires were eliminated, and the data's correctness was confirmed by closely examining it for anomalies and contradictions.

In conclusion, a number of steps were taken to ensure the accuracy and consistency of the data gathered for this investigation. By maintaining the specific participant anonymity, using safe data gathering techniques, and carefully examining the correctness of the data, we were able to reduce the possibility of bias and validate the reliability of our findings furthermore.

3.4.3 Data analysis procedures. In order to summarize and explain all participant replies to the closed-ended survey that specific items, we used effective descriptive statistics, such as means and standard deviations, in the analysis.

Our first steps in the survey analysis of data were to look for outliers and missing data. To overcome this, we used multiple imputation with fewer than 5% missing data. The results of normality testing showed that the data was roughly distributed normally. We next calculated descriptive statistics to provide a concise summary of the participants' answers to the closed-ended questions, such as means and standard deviations. Then correlation and regression analysis will be conducted for hypotheses tests.

3.4.4 Reliability and validity. The reliability analysis conducted on the scale, incorporating all variables, reveals a Cronbach's Alpha coefficient of 0.584. Additionally, Cronbach's Alpha based on standardized items is reported at 0.596, with a total of 22 items in the scale. The Case Processing Summary indicates that all 315 cases were valid and included in the analysis, employing listwise deletion based on all variables. Certainly, reliability and validity are pivotal aspects of any research study, ensuring that the data collected is accurate and meaningful.

As a measure of internal consistency, Cronbach's alpha illustrates how closely linked items are to one another on a scale or subscale.

The reliability analysis was conducted on four different scales: PU (PU1, PU2, PU3, PU4), Perceived Ease of Use (PEOU1, PEOU2, PEOU3), Behavioral Intentions (BI1, BI2, BI3, BI4, BI5, BI6, BI7, BI8), and Firm Innovativeness (FI1, FI2, FI3, FI4, FI5).

Table 1

Scale: Reliability Statistics for Firm My Variables

Variable	Cronbach's Alpha	N of Items
Perceived Usefulness	.622	4
Perceived Ease of Use	.514	3



Table 1 (Cont'd)

Behavioral Intentions	.722	8
Firm Innovativeness	.653	5

The PU scale had Cronbach's Alpha of 0.622, while the PEOU scale had 0.514, while the BI and FI scales had Cronbach's Alpha values of 0.722 and 0.653, respectively. These positive values suggest reliable internal consistency among the items in the scale. This suggests that the items in the measure are closely related and are measuring the same underlying construct reliably.

3.5 Limitations

One of the study's limitations is that our example should not be entirely representative of the people's demand of the MENA regional area. Furthermore, our information collection processes may have run and introduced biases including social bias in survey to specific replies and biases from recurred individuals in qualitative and quantitative data. We ran a mixed-methods approach towards it and spoke with field professionals to improve the efficiency, accuracy and dependability of our information gathering tools and procedures in order to reduce these limitations.

Apart from that, our sample may be biased toward self-selection because those who chose to take part in our survey might have had more useful or adverse encounters that empowered it with AI in the banking department than those who did not.

Furthermore, the fact that our case study was limited and handled to the specific perspectives and experiences involved with shared by those individuals in the area that may have limited the acceptability of our results to other areas or sectors of the economy efficiency.

Also, our research focused only on evaluating AI's efficacy in the financial industry, ignoring other variables that can have an impact on the technology's adoption and success. We didn't look into things like the managers, leadership support, organizational culture, or legal frameworks.

Apart from that, there exists a possibility of bias in responses in the survey data, as respondents may have opted individual for a socially acceptable response to encountered difficulties in precisely recalling their AI-related experiences so that can

be more beneficial in the finance industry area. We used a variety of question formats in the survey to empower and ensure participant individuals to privacy to encourage open communication in order to allay this worry.

Finally, by using a mixed-methods approach, our case study aimed to expand and explore the efficacy of AI in the MENA regional area. Although our results show that participants generally believed AI to be helpful in the financial firmly industry, it's vital to recognize and to identify the limits of the case study. Subsequent investigations may set these constraints, so augmenting to the overall comprehension of the subject matter of overall efficiency.



Chapter 4

Findings

A clustered column chart is used to display the quantitative data, while a Likert scale is used to measure opinions or views. The elements on this scale are arranged in ascending order, with "Strongly Disagree" at the far-left end and "Strongly Agree" at the opposite end. Next, using this scale, participants were asked to rate 22 items according to how likely or how much they agreed with them.

Regarding AI adoption, the data suggests a balanced distribution of opinions, with 49.2% ranking adoption as medium, 48.6% as high, and 2.2% as poor. This indicates a moderate level of AI integration across the surveyed institutions. In summary, these frequency tables provide a comprehensive overview of the characteristics and perceptions within the sample, laying the groundwork for more in-depth analyses and insights.

4.1 Descriptive Statistics

This table presents the descriptive statistics of key constructs evaluated in our study, offering insights into the average scores (Mean), variability (Standard Deviation), and the number of responses (N) for each construct. These metrics provide a foundational understanding of the participants' perceptions and responses towards the assessed variables.

Table 2

Descriptives

Construct	Mean	Std. Deviation	N
Behavioral Intentions	4.0472	.29493	315
Perceived Ease of Use	4.1026	.45113	315
PU	4.1476	.33570	315
Firm Innovativeness	3.9917	.37577	315

These statistics indicate a generally positive response towards the constructs, with PU scoring the highest on average. The standard deviations suggest a range of responses, with PEOU showing the most variability.

4.2 Correlations

A Pearson correlation offers insights into the bivariate relationship between two variables.

Table 3

Correlations

	BI	PU	PEoU	FI
BI	1.0			
PU	0.361	1.0		
PEoU	0.462	0.019	1.0	
FI	1.0	0.228	0.17	1.0

The correlation matrix provides insightful findings that align with several hypothesized relationships. Notably, there is a statistically significant positive correlation coefficient of 0.361 between PU and BI, supporting H1 ($p = 0.000$ at the 0.05 level). This suggests that an increase in PU is associated with a rise in BI, thereby endorsing the anticipated positive relationship. Further, the correlation coefficient between PU and PEoU, as posited in H5, stands at 0.019. This represents a weak positive correlation, indicating only a slight association between these two variables. Additionally, the matrix explores the relationship between PEoU, and FI as outlined in Hypothesis H12. Here, the Pearson correlation coefficient is 0.170, signaling a weak positive correlation and implying a modest link between the two variables. Similarly, the Pearson correlation coefficient between FI and PU, corresponding to Hypothesis H11, is 0.228. This too indicates a weak positive correlation, suggesting a mild relationship between the two. These findings collectively offer a nuanced understanding of the interrelations among the studied variables.

4.3 Regression

In the presented regression table 4, we explore H1, the relationship between PU and BI. The analysis aims to reveal whether there is a positive effect.

Table 4

H1 Regression Table

	R ²	df	F	P	β	t	P
Constant	.053	1	17.2	.000 ^b	2.7	11.4	.000

PU	0.3	4.1	.000
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Moving to the regression analysis, the Model Summary indicated that the predictor variable, PU, accounts for 5.3% of the variance in BI (R Square = 0.053). The ANOVA results further confirm the significance of the model (F = 46.782, p = 0.000), suggesting that the regression model as a whole is a good fit for the data. The coefficient for PU is 0.053 (p = 0.000), indicating a positive and significant relationship. This suggests that for every one-unit increase in PU, BI are expected to increase by 0.053 units.

In this second regression analysis in Table 5, H2 was explored, the relationship between PEOU and BI.

Table 5

H2 Regression Table

	R ²	df	F	P	β	T	P
Constant	.214	1	85.0	.000 ^b	2.8	20.8	.000
Perceived Ease of Use					0.3	9.2	.000

Model Summary indicated that PEOU accounts for 21.4% of the variance in BI (R Square = 0.214). The ANOVA results confirm the significance of the model (F = 85.0, p = 0.000), indicating that the regression model as a whole is a good fit for the data. The coefficient for PEOU is 0.214 (p = 0.000), indicating a positive and significant relationship. This implies that for every one-unit increase in PEOU, BI is expected to increase by 0.214 units.

Exploring H5 in Table 6, the relationship PEOU and PU.

Table 6

H5 Regression Table

	R ²	df	F	P	β	T	P
Constant	.000	1	.111	.740 ^b	4.090	23.6	.000
Perceived Ease of Use				.014	.333	.740	

The analysis investigates the relationship between PEOU and PU in the context of Hypothesis H5, which posits that PEOU has a positive effect on PU, Model Summary indicated that the PEOU in H5 has the variance in PU (R Square =

0.000). The ANOVA results confirm the significance of the model ($F = .740$, $p = 0.000$), indicating that the regression model as a whole is a rather weak fit for the data.

Further exploring H11 in Table 7,

Table 7

H11 Regression Table

	R ²	df	F	P	β	t	P
Constant	.052	1	17.2	.000 ^b	3.0	11.4	.000
PU					.35	4.1	.000

Model Summary indicated that PU accounts for 5.2% of the variance in FI (R Square = 0.052). The ANOVA results confirm the significance of the model ($F = 17.2$, $p = 0.000$), indicating that the regression model as a whole is a good fit for the data. The coefficient for PEOU is 0.052 ($p = 0.000$), indicating a weak positive and significant relationship. This implies that for every one-unit increase in PU, FI are expected to increase by 0.052 units.

In this last regression table, H12 was explored stating a higher level of PEOU is positively related to FI.

Table 8

H12 Regression Table

	R ²	df	F	P	β	t	P
Constant	.03	1	9.4	.002 ^b	3.4	17.8	.000
Perceived Ease of Use					.142	3.1	.002

Model Summary indicated that PEOU accounts for 3% of the variance in FI (R Square = 0.03). The ANOVA results confirm the significance of the model ($F = 9.4$, $p = 0.000$), indicating that the regression model as a whole is a good fit for the data. The coefficient for PEOU is 0.03 ($p = 0.000$), indicating a weak positive and significant relationship. This implies that for every one-unit increase in PEOU, FI are expected to increase by 0.3 units.

Chapter 5

Discussion and Conclusion

In order to conclude the study, this chapter will examine the actual research findings with respect to the objectives and research questions as well as their significance and worth. It will also offer recommendations for further research.

5.1 Discussion of Findings for the Research Question

The empirical findings obtained from this research interpret a primary and optimistic perspective on the integration of AI within the financial sector. In addition to the visible operational efficiencies and enhanced risk management outcomes, a relevant discovery emerges relating to the approachability and proactive engagement of employees towards AI adoption in their professional atmosphere.

Contrary to alarms regarding workforce displacement, practical evidence emphasizes a persistent and productive attitude among financial sector personnel towards AI technologies. Employees exhibit a genuine enthusiasm to expand their knowledge and proficiency in AI applications (Morandini, et al., 2023), viewing these technologies not as potential substitutes but as collaborative tools augmenting their existing skill sets.

Furthermore, the data clarifies a collective leaning among financial professionals to seek educational opportunities such as training programs and workshops, affirming a commitment to continuous learning and adaptation in the face of evolving industry paradigms. This shift among employees not only signifies a union of human and technological capabilities but also underlines the potential for an all-in-one evolution towards a future characterized by the symbiotic integration of AI within the financial sector.

5.2 Conclusion

The purpose of this thesis study is to determine and assess the effects of AI applications on the MENA region's financial industry and look into the degree of agreement among finance staff over the adoption of AI. The study aims to answer the following questions: "What future transformations might AI bring to the MENA

financial sector?" and "How does the financial workforce in the MENA region view AI integration?"

According to our research, most participants thought AI was useful in the finance industry. The findings indicate that businesses typically use AI technology in their financial procedures and consider AI to be a significant and useful part of their business operations. The successful transition to the future workforce necessitates the joint efforts of executives and employees. By leveraging AI and adopting a lifelong learning mindset, we must all get ready for change. In order to involve employees in the process, companies need to reconsider their organizational structures and procedures. Additionally, employees should take advantage of any opportunity to learn in the long run.

5.3 Recommendations

Further exploration into the diverse applications of AI beyond the financial sector is imperative for a comprehensive understanding of its broader implications. Additionally, it is crucial to recognize the pivotal role AI plays in supporting the growth of financial services. Various institutions have already initiated digital transformations, leveraging AI to gather invaluable insights from their data, thereby augmenting productivity and facilitating sales. A forward-looking perspective suggests an imperative need for the future elevation of personalized, interaction-oriented client engagement.

Furthermore, an investigation into the potential strategic and economic advantages that AI offers to enterprises remains a viable avenue for research. To enhance the strength of findings and extrapolate meaningful insights, it is recommended that a broader spectrum of participants be engaged in forthcoming surveys. This approach will contribute substantively to refining the understanding of the strategic and economic implications of AI adoption across diverse sectors.

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