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## **Study plan**

**The role of artificial intelligence in financial management At the  
Commercial Bank of Iraq**

### **Preparation**

**Abdul Rahman Ashour Hamed Hamed**

**Academic year**

**2022-2023**



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## **“Study plan”**

### **Chapter One: Introduction**

#### **1. Introduction**

<1.1> The importance of the study and the reasons for choosing the topic

<1.2> Objectives of the thesis

<1.3> The problem (questions) of the thesis

<1.4> Limitations of the thesis and its obstacles

<1.5> The approach followed in the thesis

<1.6> The most important previous studies

### **Chapter Two: The role of artificial intelligence in financial management**

<2.1> History and development of artificial intelligence.

<2.2> How can artificial intelligence help develop the work of the financial management department?

<2.3> Areas of use of artificial intelligence in financial management

<2.4> Mistakes that can be avoided using artificial intelligence in financial management



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<2.5> The most prominent companies that have applied artificial intelligence in financial management

<2.6> Using Android Studio and Java to write code.

**Chapter Three:** Field , applied study And Coding.

**Chapter Four:** Result Of Study

**Conclusions and Discussions**

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## **1. Introduction**

Financial institutions nowadays are feeling more and more pressure to adopt the societal expectations that are now a part of their business plan. This factor has expanded the idea of business sustainability because all of these organizations want to give stakeholders and employees the freedom to investigate other alternatives in order to realize competitive advantage. Promoting sustainable practices and development within the financial industry requires careful financial management. Organizations have embraced the use of Artificial Intelligence (AI) in key financial management procedures to ensure that financial management is properly implemented in monitoring, assessing, and disclosing the progress made within the specified period.

Some financial processes, such as the fiscal diligence used to modernize and enhance credit judgments, have improved as a result of various AI methodologies. The finance managers have had success using this strategy to oversee and control all administrative activities and transactions within the firms.

The ongoing application of AI has sparked the creation of business models that have significantly altered the finance industry. In the finance industry, AI has also been a significant technological achievement because it has allowed financial firms to reduce costs and increase value faster. The majority of the global financial sectors use AI in their daily operations to provide consumers with better functional help. These features of functional assistance range from fraud detection chatbots, recheck testing, robotic instructing, simulated purchaser subordinates, market exploration, as well as supervisory and trial assessment testing (Babel et al., 2019; Johnson et al., 2019). Some of these



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features include algorithm tradeoff, configuration of the trading portfolio, and model authentication.

These technological capabilities have caused tremendous transformations in the sector of finance increasing transparency and security while conducting diverse financial transactions across the 3 globe. Therefore, the analysis of diverse literature materials, as well as discussions on applications of AI in financial management, would contribute to the evaluation of the general effectiveness of AI in increasing financial transactions globally.



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### **<1.1> The importance of the study and the reasons for choosing the topic**

The importance of the thesis comes down to identifying technology within the financial industry and its use in financial management, and the phrase “artificial intelligence” encompasses a very broad scope. We also need to study and present the applications and potential risks associated with the use of artificial intelligence in financial management, and the sole purpose of this thesis is to investigate, and ideally, find out the financial management applications in which artificial intelligence is now being used. We will discuss how technology has recently impacted the market and provide actual examples of how different AI technologies are being used and impacting businesses today. The following reasons are of interest:

1. To describe the role of artificial intelligence in financial management: a theoretical perspective At the Commercial Bank of Iraq.
2. To represent the classic and modern look of AI At the Commercial Bank of Iraq.



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## **<1.2> Objectives of the thesis**

The term “artificial intelligence” covers a very broad scope, and our goal with the thesis is to identify technology within the financial sector and its use in financial management. Furthermore, we will analyze and present the potential applications and risks that may spread with the application of artificial intelligence in financial management. The aim of this thesis is simply to study and hopefully discover the areas of finance management in which AI is being used today and what it can do in the future. We will cover how technology has penetrated the market in recent times and come up with real-life cases where different AI technologies are being used and how they are impacting businesses today. Attention is paid to the following objectives:

1. Examine the theory and history behind AI to better understand the use cases and what the technology can do in financial management At the Commercial Bank of Iraq.
2. Examine the sub-technologies within our AI and whether they can be integrated with financial management At the Commercial Bank of Iraq.
3. Discussing applications, risks, and potential impacts of using artificial intelligence in financial management At the Commercial Bank of Iraq.
4. Identify the current and future use of artificial intelligence in financial management At the Commercial Bank of Iraq.
5. Conduct a case study where the theory is put into a practical context in financial management At the Commercial Bank of Iraq.

## **<1.3> The problem (questions) of the thesis**



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1. What is artificial intelligence?
2. What is the role of artificial intelligence in developing and solving financial management problems At the Commercial Bank of Iraq?
3. Why isn't AI currently being used as frequently in financial management as it is in tech companies like Google, Facebook, etc.?
4. What potential benefits and drawbacks could arise from integrating different AI technologies?
5. What role does AI play at Boulder Bank, and how does it differ from Sparebanken Vest?





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## **<1.4> Limitations of the thesis and its obstacles**

### **<1.4.1> The limits of the study:**

- You will be in the Commercial Bank of Iraq.

### **<1.4.2> Study obstacles:**

1. Awareness and study of employees about the new system for artificial intelligence in management at the Commercial Bank of Iraq.
2. Solutions to problems and challenges of errors in the software of the new system for artificial intelligence in management at the Commercial Bank of Iraq.

## **<1.5> The approach followed in the thesis**

The research method is desk and conceptual research. This research is propounded for new age financial learners and management students, who want to familiarize themselves with financial knowledge. The Research Design has been done on the basis of personal reading, observation and focus on the conceptual framework of artificial intelligence in financial performance. Data Collection: In this research the data has been reviewed from secondary sources such as books, research paper or journal articles, internet reports and newspaper articles etc.

S.No	Development Stages	Reform Technology	Mode or Services	Financial Performance	Impact of Technology in Finance (As Relationship)
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1.	Fintech 1.0	Computer (Information Technology in Finance)	(i) Credit Card, (ii) ATM, (iii) Customer Relationship in Management etc.	Low	Technology as a tool in Finance.
2.	Fintech 2.0	Mobile Internet (Internet in Finance)	(i) Third Party Payment (ii) E- Insurance (iii) E- Banking (iv) Crowdfunding (v) E- Commerce etc.	Medium	Technology reforms financial activity such as offers and services to ease and convenience.
3.	Fintech 3.0	AI, Big data, Block Chain, Data Science (AI in Finance)	(i) Intelligent Finance (ii) Data Automation	High	Technology helps to make financial decisions
Finance Look		Financial Problems			
Financial Institutions and Services	Credit Management, Risk Management, Loan Management, Investment Portfolio Management, Automation Investment Management, Fund Transfer Management	AI(Artificial Intelligence) based Automation Investment, Credit, Loan, fund and Risk Management	Major Problem s: Financial Fraud, Error and Mistake, Credit Rating Analysis, Financial Valuation and Estimation Security, Finance Optimizing, Financial Risk, Credit Risk Management, Repayment of Loan Credibility, Financial Loss and	Problem Solving by AI : <ul style="list-style-type: none"> <li>Financial Analytics,</li> <li>Risk Analytics,</li> <li>Game Theory,</li> <li>Simulation,</li> <li>Optimization and Prediction Analytics,</li> <li>Smart Work by Machine,</li> <li>Reinforcement Learning Techniques,</li> </ul>	



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			Crime, Financial Mechanism, etc.	<ul style="list-style-type: none"> <li>• Profiling Techniques,</li> <li>• Behavior Analytics and Behavior Information Method,</li> <li>• Classification in Clustering Techniques</li> <li>• Hypothetical or Probabilistic Modeling</li> <li>• Semi – Supervised Learning Method,</li> <li>• Event Analysis</li> </ul>
			Minor Problems: Set Financial Limit, Financial Scheduling Management, Financial Predicting and Forecasting  related Credit valuation, Estimation	
			Find out Default List, Refund  Services, Refinance, other Risk Financial Services, etc.	<ul style="list-style-type: none"> <li>• Deep Neural and Sequential Modeling, etc.</li> </ul>



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Financial Market	Financial Market Analysis, Check Market Performance and Trends, Marketing Mix Analysis and Campaign, Market complexity, Market Dynamic, Customer Relationship Management, Financial Interaction and re-location Management, Market anomaly analysis	<ul style="list-style-type: none"> <li>Intelligent Market</li> <li>Financial market analysis and forecasti ng</li> </ul>	<p>Major Problems: Market Testing Mechanis ms, Financial M arket Models, Financial Market and Investors Influences, Financial Market Participations, Marketing Performance</p> <p>Minor Problems: Simulating Market, Market Trading Rules &amp; Regulations, Relationship and Interaction w Multidimensional Propaganda of Financial Events or</p>	<ul style="list-style-type: none"> <li>Quanti tative Model ing</li> <li>Computer Simulation Modeling</li> <li>Data Analytics</li> <li>Game Theory</li> <li>Agent-based Modeli ng</li> <li>Market Outlier Detection Method</li> <li>Machine Interaction with Human or Human Machine Interaction</li> <li>Optimizatio n Learning Method</li> <li>Information and Network Theories</li> <li>Machine Learning</li> <li>Statistic al and Mathem atical Modelin g</li> <li>Relation Learning Model</li> <li>Graph Theories</li> <li>Behavior Analytics</li> <li>Event Modeling</li> <li>Probab ilistic Modeli ng</li> <li>Classification and Clustering Method</li> <li>Numerical Modeling</li> <li>Change Analysis</li> <li>Econometric</li> </ul>
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- s and Forecasting
- Reinforcement Learning
- Profiling
- Social Media Analysis
- Recommender Systems, etc.



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E-Financing	Trading Design, Trading Optimization,	Intelligent e-Trading & Investment, Management	Major Problems: Financial Market Trends, Movement, Predicting and Modeling	<ul style="list-style-type: none"> <li>Machine Learning</li> <li>Pattern Mining</li> <li>Deep Models</li> <li>Time-Series Analysis</li> </ul>
	Automation and Smart Investment, Machine based financing or Artificial financing, Financial Time Analysis		Movement, Volatility dynamics, Design Portfolio, Event and Market Minor Problems: Market Volatility Dynamics, Explore and Optimizing Strategy, E- Trading Management, Algorithms, Choosing Platforms and services with Market Forecasting, etc.	<ul style="list-style-type: none"> <li>Quantitative Analysis</li> <li>Game Theories</li> <li>Risk Analysis</li> <li>Sequence Analysis and Dynamic Process</li> <li>Market Representation</li> <li>Learn To Rank</li> <li>Portfolio Optimization Techniques, etc.</li> </ul>
Financial System	Acquaintance Financial Systems	Modeling and Economic Financial Mechanisms	Major Problems: Financial Process, Interaction, Pattern Design, Modeling Policy Pattern, Financial Pricing, Path, etc. Minor Problems: Hypotheses, Financial Relations, Financial Services & Trading, Movement & Financial effect, etc.	<ul style="list-style-type: none"> <li>Statistical Modeling</li> <li>Machine Learning</li> <li>Theories of complex Systems</li> <li>Simulations and Modeling</li> <li>Qualitative and Quantitative Techniques</li> <li>Mathematical Modeling</li> <li>Game Theories, etc.</li> </ul>



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## **<1.6> The most important previous studies**

### **<1.6.1> Financial Management and Sustainable Business Practices**

A study on the relationship between financial management and corporate sustainability business practices indicates that financial management facilitates the formulation of decisions related to the acquisition and management of financial assets resources. This is an important aspect that helps in streamlining the organizational plans (Al Ahbabi and Nobanee, 2019). The research findings have indicated that financial management facilitates effective administration and compliance of cash flow management for the future productivity of an organization. The skills of financial management enhance the tracking of the organizational performances, identification of financial problems, and exploration of new opportunities to reduce the occurrence of major risks. The financial organizations have also implemented corporate sustainability that fosters the realization of sustainable prosperity of the business (Alkaabi and Nobanee, 2019). Some of the corporate governance practices embraced by the financial organizations comprise financial management, risk management, compliance to code of conduct, and talent attraction.

Studies on effective financial management practices have indicated that the improvement of management systems, creation or developing of financial value, increases transparency to all stakeholders as well as motivating staff members to increase their innovativeness (Al Muhairi and Nobanee, 2019). The presence of financial management procedures offers a robust corporate structure of governance that lowers the information asymmetry linked to institutional ownership, equity incentives, and board independence (Al 4 Muhairi and Nobanee, 2019). This allows all stakeholders to ensure that the financial organization can



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achieve its overall goal of being profitable and competitive. Financial management facilitates the popularization of corporate reputation within the financial limits of the organization considered as a capital risk that promotes sustainability in capital budgeting (Rashmi & Nirmal Raj, 2021). Researchers have also indicated that long-term profitability is achieved through the use of modern technological approaches (Ali et al., 2020). The presence of issues affecting sales and hat costs associated with external financing may subject an organization to consider pursuant for more capital management strategies that would increase the effectiveness of the financial organization.

### **<1.6.2> Artificial Intelligence and Financial Management**

Studies on AI in the financial sector have indicated that AI has made major progress in enabling the creation of professional financial applications that have shaped the finance industry (Babel et al., 2019). Through this approach, AI has complemented human capabilities in ensuring that customers can access high-quality services. Major organizations globally utilize AI applications in determining anomalies that lead to the establishment of optimal investment strategies. A study on the AI applications has provided recommendations that innovations such ass trading algorithms should be utilized in integrating information regarding the changing market dynamics and price levels (Johnson et al., 2019). This can be achieved with the proprietary algorithms that make trading rapid and effective (Johnson et al., 2019). Before implementing the AI features within the organization, the financial management team should ensure that the main tasks which include risk recognition, assessment, and prevention are identified and captured in the system for better market improvements. These unique features have made been a part of the great interventions of the financial industry utilized to increase the delivery of





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modern and consumer-based services. The capitalists have realized that they require robust methods of dealing with financial procedures as there is an advancement of 5 digitization from the international perspective. The most important aspect is that as the financiers and the private enterprise invest in diverse technological applications, they should pinpoint the emergent areas of the business.

Research studies on chatbots and the simulated subordinates have highlighted that the financial world is embracing these features at a very high rate, which shows that the financial market is rapidly embracing modern innovations (Jakšič & Marinč, 2019). More precisely, such financial institutions as banks require these AI innovations as they need expanded capacities for queries related to customer call centers and client correspondence by e-mail. To satisfy this need, the financial sector has embraced the use of the bank convectional customerservice model that has ensured that all customer-related services are synchronized effectively. The hi-tech personality chatbots are important features implemented by financial organizations as they provide automatic assistance within fiscal applications. The emergence of E-commerce resulted in online fraud where many financial institutions and customers have been defrauded of great sums, which made most of them less confident in utilization diverse online platforms (Donepudi et al., 2020). The system developers have recently incorporated AI to identify and crosscheck all transactions with reliable prevention sectors in a move to increase safety in all the transaction procedures. For example, the studies on how AI is incorporated in the use of banking MasterCard have indicated that this innovation has contributed to the reduction in crime rates. Hence, if the fraudster tries to perform financial transactions with the card, the system quickly scans the card and shares a message to the original user on their emails or phones where the owner



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of the card will be required to approve the transaction before the operation is completed (Tang, 2021). This approach has greatly helped in the reduction of the criminal cases related to the stealing of MasterCard since the thieves cannot perform any transaction without the owners' consent.

### **<1.6.3> Challenges Associated with the Use of AI in the Financial Sector**

Research studies on the challenges associated with the use of AI have highlighted that AI is a powerful tool financial institutions already widely incorporate. However, it should be utilized with caution due to several diverse obstacles. The innovations have led to an influx in AI investment in the financial sector that has raised questions around the aspect of data security and transparency (Donepudi, 2017). These challenges contributed to the presence of unclear queries regarding data management practices. One of the main challenges associated with AI in this sector is the amount of data collected containing sensitive and confidential information, which is an indication that the system developers receive plenty of raw information they can wrongfully utilize to perform diverse fraud actions. To lessen this challenge, these financial institutions should ensure that the companies selected are compliant with industry-specific or religion-specific data regulations such as the SOC2, HIPAA, GDPR, and the CCPA (Vieira & Sehgal, 2018). Another major challenge is the lack of localization of technological innovations and applications. A research study on the importance of system localization has shown that localization is a vital component within the financial service sector as the companies need to design models with multiple markets to serve customers with unique needs and requirements. The research findings of this study have indicated that the lack of the localization aspects limits the financial sectors from incorporating diverse cultures,



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languages, and demographics properly in customizing unique customer experiences (Kumar & Balaramachandran, 2018). Only the AI system developers can improve such challenges allowing in the future the local organizations to adjust the nature of the systems to fit all customers' orientations. This will enhance their use of the systems that will, in turn, contribute to improved financial transactions, thus increasing the growth of the financial digital market.

A study on the models utilized in enhancing the networks and other machine learning models indicates that the preferred models are quite complex that makes the interpretation harder to understand and explain as compared to traditional methods. To some extent, the strategy leads to an increase in risks and demands that might minimize the fines, which will lead to the loss of reputation for the financial firm (Prentice et al., 2020). To curb this challenge, the financial sectors have ensured that they explain the rationale behind using the model to all stakeholders, thus making them support the model despite the presence of different challenges. The applications have also another challenge of being provided with accurate and reliable data throughout the operations as new information will be required by the system for efficient interpretation procedures. Most of the financial sectors have limited capacities to incorporate this type of data that will facilitate the provision of reliable and valid services to the customers (Soni, 2019). The above challenge can be resolved through the hiring of qualified individuals and offering in-service training to ensure they can identify the major aspect that will be incorporated in the system to make it more valid and reliable.

A study on traditional methods used in the financial sector has led to the realization that most of the financial sectors are utilizing data centers with shared drives and computer



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networks to share information from one office to another (Kaur et al., 2020). This trend is outdated as robust systems are being implemented, thus easing the conveyance of the information as these systems can complete all the transactions without consulting other offices (Kaur et al., 2020). The incorporation of such innovations requires considerable capital investments that might not be affordable for small financial institutions. This challenge can only be resolved by these companies either merging or identifying cheaper AI applications that can service similar purposes as they grow their revenue base to enhance the purchasing of the complex systems (Lui & Lamb, 2018). The shifting from the traditional systems is now a compulsory alternative as most of the service providers have opted for the use of these innovations considered as being reliable and effective in the management of customer-related operations and transactions. Organizations that have invested in AI are facing the challenge of 8 having difficulties in identifying whether they have reaped big from the AI investments, which shifts the focus to direct and fast returns from these systems. This mentality has led to a loss of productivity since the organizations will be fully dependent on the systems for decisions instead of complementing these decisions with their personal knowledge (Wall, 2018). The organizational leader should ensure that all the employees are fully aware of the needs associated with the systems to increase system acceptance within the company. In such a way, the employees will work hand in hand with the systems to ensure the interpretation of all the required information is done competently and reliably.



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