
THE ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING CONTROLLING AND ITS IMPACT ON INVESTMENT MANAGEMENT: SYSTEMATIC LITERATURE REVIEW

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Abstract

In light of the rapid development of technology, institutions benefit from the capabilities of advanced technologies to achieve efficiency. In a similar approach, control will benefit from artificial intelligence by providing great strategic supervision and reducing manual procedures, and providing a smart control service supported by modern technologies to improve investment management and thus achieve sustainable success in investment projects. The aim of the review is to fill the research gap by providing a blueprint for research methods on the topic in the literature and proposing a new intensive framework for the effective use of artificial intelligence, which represents modern technology has radically transformed investment project management, and artificial intelligence provides a wide range of opportunities to improve the efficiency and quality of investment management such as (data analysis, improved planning, improved decision-making). This paper includes a systematic literature review (SLR) approach and aims to shed light on the state of research on the use of artificial intelligence in enhancing control and the reflection of this development on investment management in projects to provide insights to scholars and researchers on this issue, and to reveal the implications of new artificial intelligence technology. This work makes significant contributions to guiding future research directions and developing theoretical foundations for the field of artificial intelligence. At the practical level, the work will help evaluate and understand the potential advantages and risks of applying artificial intelligence within the framework of control in institutions.

Keywords: Artificial Intelligence, Control, Investment.

Introduction

Our world today is witnessing a massive digital transformation, driven by rapid technological progress, especially in the field of artificial intelligence. This transformation is no longer limited to specific fields, but has extended to include all sectors, including the financial and business sector.

Artificial intelligence is a term given to the science of computer science. This science belongs to the modern generation of computer generations, as it aims for the computer to simulate the human mind so that the computer has the ability to solve problems and make decisions in a logical and organized manner that is consistent with the way the human mind thinks.

Audit is a high-quality technical procedure carried out by a qualified and independent employee to ensure that an objective and reliable assessment of the quality and accuracy of information is given and that the criteria applied in determining this information are respected under all circumstances.(Ali Karim Khudair Abu Zabiba and Sondos Majid Reda Al-Jaafari, 2023)

AI can detect hidden patterns and fraud faster and more accurately than humans can, thus contributing to enhanced controlling of investment projects. AI technologies play an important role in investment management, as they analyze a set of data by leveraging machine learning algorithms. AI systems can detect patterns and relationships that may be difficult for humans to identify. This enables informed, data-driven decisions to be made. AI can reduce human biases that affect investment decisions. For example, AI can identify patterns, predict future trends, and assist investors in making investment decisions. (Karthika et al., 2023)

Investment management is the lease on which the success of the institution is based in achieving the investment goal, by enhancing its ability to manage investments by achieving a balance between the elements of security and profitability, as this goal requires managing investments in a way(Ahmad, 2024)

At the heart of this transformation is the role of artificial intelligence as a powerful tool capable of reshaping our concepts of risk management and investment management. In the context of this development, artificial intelligence is gaining increasing importance in the field of control, thanks to its enormous analytical capabilities and its ability to process huge amounts of data in record time.(Khaled Ziadeh, 2024)

But(Fridgeirsson et al., 2021)Discusses the impact of AI in project management and highlights that AI improves the projects that are delivered and managed. Although such reports highlight that project leaders say that AI technologies encourage investment project management productivity and enhance the quality of work, there are no studies covering this topic in the literature that focus on analyzing AI technologies in the areas of investment project management performance. The question that arises is how AI technologies will be able to enhance control systems and procedures, and thus how it will evolve to achieve disciplined investment project management that is fully subject to control.

To the best of the researcher's knowledge, there has been no systematic literature review on the application of AI technologies to support regulatory systems to improve investment management. Therefore, the aim of this research is to explore the role of AI technologies in enhancing regulatory systems to improve investment management through literature

analysis. Our review provides insights into how AI technologies can be aligned with regulatory systems and their impact on investment management. This unique contribution distinguishes this research from previous literature reviews.

The subsequent parts of the study are organized as follows: Section 2 provides an overview of the AI, control, and investment management methodologies. Section 3 then explains the research methodology used and in Section 4, a critical review of biometric analyses and related literature is conducted. Section 5 presents the findings from the study. Finally, Section 6 presents the conclusions drawn from the research.

2- Related works

2.1 :- Artificial Intelligence

There is an ongoing debate about how to define artificial intelligence. In fact, there are different ways to define it. On the one hand, some researchers aim to introduce the capabilities of the human mind into computers, and on the other hand there is a trend to understand artificial intelligence as the science of creating intelligent machines, not necessarily using methods that can be observed biologically⁴. (Taboada et al., 2023)

It is also known as a branch of computer science that is involved in developing technology capable of human-like cognitive processing. Artificial intelligence includes everything from robots designed to interact with the physical environment and the use of complex algorithms capable of learning from existing data and reaching accurate predictions. (Jamnik, 2019)

In light of the above, it becomes clear to us that artificial intelligence is nothing but an evolution of information technology so that it has the ability to perform tasks that require intelligence similar to the intelligence of the human mind, which helps reduce time waste, increase accuracy and efficiency, and avoid bias with the lowest probability of making mistakes.

Given the above fact, there are a variety of technologies that contribute to the AI system. Below, we provide a description of the main technologies:

1- Artificial neural network (ANN) is one of the applications of artificial intelligence that uses many machines, devices, specialized programs, artificial knowledge bases, and simulation of the human mind model, to provide one of the most important methods used to increase the degree of accuracy in predicting variables in order to provide the optimal solutions that can be obtained to be achieved scientifically, and it is a system designed to simulate the way the human mind performs a specific task. (Jassim, 2020)

2- to treat Natural language (Natural language processing (NLP) is a branch of artificial intelligence that deals with human-computer interaction. Natural language processing enables understanding, synthesis, and interpretation of human language and makes activities such as sentiment analysis, language translation, and interactions with chatbots possible. (Zhang & Lu, 2021)

3- Machine learning (ML) develops mathematical models and algorithms that make computers learn from data without reprogramming them. Based on the data they analyze, machine learning algorithms discover patterns, make predictions, or take actions, which helps increase their performance through experience. (Goralski & Tan, 2022)

4-Expert systems (ES) are programs that have the ability to simulate the decision-making skills of human experts in many fields. Through a set of previously defined experiences, expert systems use the knowledge base to provide answers and suggestions to solve problems.(Qasim & Kharbat, 2020)

5-Computer vision (CV) is the field that deals with how visual information from images or videos is understood and interpreted, as artificial intelligence techniques help in knowledge, pattern discovery and task execution (face recognition, object tracking).(Chowdhury, 2023)

2.2: Controlling

Control has now developed and has become, in the opinion of management, economics and finance scholars, necessary in any system, as any administrative and material system that does not have effective and regular control is an incomplete system that lacks the components of its existence and contributes to the failure of organizations. Most opinions define control as the administrative procedure or process that management carries out to ensure that the plans laid down have been fully achieved or to verify performance, by comparing what is actual with what was planned, and making things happen according to the method or plans laid down, and in a way that achieves its interest, and working to correct any deviations that occur in the future.

The purpose of control is to verify the effective and appropriate management of business and that implementation is carried out in accordance with what was planned and within the applicable laws and legislation. Accordingly, the objectives of control can be summarized as follows:

- 1- Effective and optimal use of material and human resources.
- 2- Detecting deviations from what is planned in a timely manner.
- 3- Identifying the causes of deviations and taking the necessary measures to address them and ensure that they do not recur.

The functions of the controlling bodies were limited in the early stages to reviewing the central state agencies, and aimed to uncover accounting errors that might exist in the records and books of those agencies. Later, controlling targeted

Verifying compliance with various laws and legislations, which resulted in what is known as compliance control or legitimacy control. Then, control developed in terms of its function, to include research into the adequacy of projects and programs, and their effectiveness in achieving the goals of the state's economic and social plans. This developed aspect of control was called performance control.(Dr. Diwan Abdul Razzaq, 2021)

Division of control according to the date of its implementation into:-

- 1- Prior control: It is sometimes called preventive control because it aims to ensure that all decisions and activities are carried out in accordance with the regulations. This control is at a stage prior to the implementation process, as it prevents errors and deviations from occurring and confirms that the work is in compliance with the laws.
- 2- Concurrent control: It is the control that accompanies the implementation process, as it begins from the stage of implementing the work and following up the implementation steps step by step in order to identify shortcomings and deviations from what is planned and according to the established controls and instructions.

3- Subsequent control: This control is exercised after the completion of the work to measure the results and compare them with the standards that have been adopted. This control focuses on the results and directs corrective actions and directs the initial and concurrent control regarding the correct future activities.(Kamal Boudana and Professor Dr. Abdel-Aali Dibla, 2020)

2.3: Investment Management

Investment management means a series of actions and situations, a process aimed at solving some problems. The management mechanism can be represented in steps, which are defined as a series of actions or steps to solve a specific problem. But any work that can be done by a certain entity in the right way requires the use of the necessary tools and resources, and the full disclosure of the management mechanism requires the following: -

- 1- Analyzing the process into separate stages and continuous stages and steps, i.e. (the functional aspect).
- 2- Defining performance for managers and employees (the organizational aspect).
- 3- Choosing tools and methods and describing the management style (i.e. the methodological aspect).
- 4- Describe the general policy to solve the basic management problem.

Investment management is also known as an organizational mechanism for project performance management because it represents a system of actions, interactions and organizational structures that contribute to solving the main problem of performance management and ensuring the continuity and sustainability of project performance growth. In order to form such a mechanism, it is important to define a set of subjects and objects that govern relationships, as well as ways of implementing them.(Mohi, 2017)

Investment projects can be classified into distinct categories.:-

- Real investment projects and financial investment projects: Real investment projects include allocations in tangible assets, which are determined in the economic framework.. In contrast, financial investing involves purchasing securities such as stocks, bonds, certificates of deposit, etc..

- Long-term and short-term investment projects: Long-term investment is characterized by its manifestations in stocks and bonds, which are commonly referred to as capital investment..

Short-term investment includes allocations in financial instruments represented by Treasury bills, bankers' acceptances, or certificates of deposit, and is defined as a cash investment..

- Independent investment and investment stimulation: Independent investment serves as a key mechanism for enhancing national income and output, either through business, government initiatives or attracting international foreign investment..

Incentive investment is characterized by its emergence as a result of increased income, which creates a direct relationship between the two..

- Material investment and human investment: Material investment represents the traditional model of investment, synonymous with real investment. In contrast, human investment

emphasizes the importance of the human factor through means such as education and training.

- Investment in research and development: This type of investment is of particular importance in developed countries, as these countries allocate huge sums of money to it because it helps increase the competitiveness of their products in the global market and also find new methods of production.

It can also be divided into the following:

-Public investment: is any investment that is made by the state as a legal entity or one of its branches. Its goal is to stimulate the forces of production and meet consumer desires. It is noteworthy that its size increased in countries that adopted the socialist system, which enshrined the principle of solidarity, confiscation and expropriation for public benefit.

-Private investment: is the one that aims to achieve private and public interest. Whether a legal person or a natural person, its purpose is to achieve the maximum possible profit, which is related to the degree of availability. People invest for money by increasing purchasing power for the citizen and not for verification. This is unless the national economy is in good health. This is it. And he is two types:

-National private investment: is the investment that we get done by people who invest. They carry out the same sex and to the state that people invest. The project has it.

-Foreign private investment: is custom through it. Sex and the investor is a foreign person who does not carry sex and the country that people invest. It has investment.

60% of participants reported experiencing positive effects from incorporating more technology in their investment process. On the face of it, 21% stated that they use techniques such as Machine learning (ML), Natural language processing (NLP), and automation. Robotic operations (RPA). While he mentioned 30% use Artificial Intelligence. These technologies have proven to be game-changing, allowing for more efficient data analysis, better decision making, and improved overall performance. (Mehrabi et al., 2019)

3- Methodology:

This study applies the methodology. SLR is based on a well-defined and well-planned protocol. Unlike the traditional literature review strategy where the subjectivity and informality of the reviewers can influence the result, the SLR method removes this bias by applying systematic procedures to identify, select and evaluate an interesting topic. (Tranfield et al., 2003)

This approach is particularly appropriate in this investigation because of its relevance to all research most relevant to emerging topics. (Aarseth et al., 2017)

This review explores the use of AI techniques to enhance controlling and its implications for investment management through a rigorous process that includes planning a search strategy, identifying targeted academic publications on established topics, defining inclusion and exclusion criteria, conducting a review, and reporting on the results. SLR has two stages. The first stage includes: - Selecting keywords and setting inclusion and exclusion criteria for

research papers for the study (i.e., publication period, keywords, language) and conducting a literature search. The second stage: - Evaluates the selected papers.

The review process planning focused on analyzing and understanding the nuances of using AI technologies in regulatory systems to improve investment management. The researcher brainstormed to identify keywords and define the conceptual boundaries of the review process. At this stage, papers published from 2019 to the present were identified. October 2024 is the appropriate time frame to focus on the most recent publications. The researcher came up with the keywords “Artificial Intelligence”, “Regulation”, “Investment Management”. The selection was made Scopus, Google scholar, Research Gate. Due to their higher scientific impact and therefore search for peer-reviewed journals and conferences. (Martín-Martín et al., 2018)

The literature search was limited exclusively to publications in English and Russian. Title, abstract, and keyword searches were performed in databases using search strings in order to identify all papers related to the use of AI technologies in control systems, investment management, and investment projects.

The next level of filtering process of selected papers from the research process was first carried out by the researcher and supervisor by reviewing and evaluating the articles. The abstract and conclusions of each selected article were carefully examined at this stage to check that the papers were in line with the study criteria. Finally, the authors met as a committee to determine the final sample for the process (SLR) that fit within the conceptual boundaries of this study. This collection represents the most comprehensive body of academic work on AI in control and investment management published to date to the best of the authors' knowledge.

4- Results:

4.1:-Biometric analysis

Literature searches on the site revealed: Scopus, Google scholar, Research Gate in the first stage (163) and in the second stage after evaluating the articles found, we finally identified (38) research papers related to artificial intelligence, control and investment management.

4.2: Literature Review:

In this section, we review the regulatory systems supported by artificial intelligence technologies on investment management based on the selected literature.

foot (Sanchez, 2020) In his thesis *The Role of Artificial Intelligence in Investment Decision Making*, he examined the views of senior private equity managers toward the implementation of AI using objective analysis. Based on the objective analysis conducted, four themes were revealed: AI in the portfolio but little use internally, the potential benefits of AI applications in private equity and venture capital firms, and senior managers within these firms need to define a clear roadmap to begin leveraging the capabilities.

He also did (Karthika et al., 2023) Highlighting the exploration of the applications and benefits of artificial intelligence in the process of enhancing decision-making and improving operations efficiently, it was found that artificial intelligence analyzes extensive financial data to make informed investment decisions. The research showed that the most important

main applications of artificial intelligence in investment management is the use of machine learning algorithms.

In this regard, he presented (Abuzabiba et al., 2024) He highlighted the role of artificial intelligence as a key to improving the effectiveness of investment projects and the challenges facing this modern technology. He followed the descriptive approach by reading the literature and previous studies related to the research topic. It was found that artificial intelligence opens new horizons for improving the effectiveness of investment projects, as the technologies used enhance analytical and predictive capabilities, which enables investors to make more accurate decisions and also contributes to improving the quality of planning processes.

He also did (Wassie & Lakatos, 2024) Highlighting the role of AI and the future of the internal audit function, AI can support a company's internal audit function (IAF) by providing greater strategic controlling, reducing manual procedures, and providing additional value-added audit service. The study recommended that a strong internal audit function structure, policies, and guidelines are essential to capitalizing on AI opportunities.

He also discussed (Brozovic, 2019) In his thesis, "Application of Artificial Intelligence in the Investment Fund Sector," he demonstrated that by implementing artificial intelligence, investment fund management companies can see significant benefits such as reduced costs and improved decision-making across all their departments.

He also did (Damar et al., 2024) In a study on artificial intelligence, where artificial intelligence includes a wide range of methods, methodologies and techniques that aim to simulate human intelligence in machines, in recent times there is no doubt that the success of ChatGPT has played a significant role in attracting all the attention. AI technology has a profound impact on all sectors, and sector representatives are seeking to adapt to this technology more quickly. In this study, the topics of super-AI, generative AI, narrow AI, and chatbots were broadly evaluated in the context of the public sector and public administration. The study showed that there are four areas of AI application in the public sector: service delivery, efficiency and automation, ethical and regulatory challenges, and data-driven governance.

In this regard, he did (Dr. Diwan Abdul Razzaq, 2021) In numbers A study on the use of artificial intelligence techniques in implementing the controlling tasks of the supreme financial and accounting auditing bodies in the public sector to identify the determinants of the growing role of artificial intelligence in the field of management and controlling and to identify the follow-up procedures adopted by the supreme financial and accounting auditing bodies and to explain the importance of investing artificial intelligence techniques in implementing the controlling tasks (opportunities and challenges) and to explain the obstacles and risks of using artificial intelligence. The study reached approximate or fixed conclusions, and the ability to automatically or automatically correct. On this basis, the modern trend in auditing and controlling based on artificial intelligence techniques requires providing auditors and controllers with a computerized data processing system used to represent information and knowledge, algorithms to map out how to use this information, and a programming language that includes both information and algorithms in programs.

The researchers confirmed (Vinokurov & Sadovskaya, 2023) In an experimental comparison between trust in artificial intelligence and humans in economic decisions, they focused their study on studying the manifestations of trust in the context of economic behavior. procedure the study through Two stages, In the first stage- During the interviews, the main factors of trust and distrust in AI were identified, and the factors of trust in AI in economic decisions were formulated separately. A subjective indicator of the level of trust in the adviser - the participant's economic activity when implementing the recommended action was also determined.

and in The second stage, It has been done Experience where It was done Request from the developer Leaving the action By work In the stock market simulator. The goal of the game was to make money by buying and selling stocks. It was there option to do for Contact an economic advisor . and The experimental group had an AI as an advisor, and the control group had a human (trading expert). According to the results of the analysis of 800 economic decisions, economic activity during the game was higher among participants in the control group who followed the advice of the person ($3.646 = t$; $0.001 < p$). As a result of the study, three main conclusions were reached: 1) The level of confidence in economic decision advice can be expressed in the form of economic activity; 2) The level of confidence in economic advice depends on whether the recommendation is provided by a person or by artificial intelligence; 3- The specific factors of confidence in economic decision advice and the speed of the required decision are highlighted.

foot (Qader & Cek, 2024) A study on the impact of blockchain technology (artificial intelligence) on audit quality, the study aimed to investigate the impact of blockchain, artificial intelligence on the audit quality of Turkish companies. Primary data were collected from (300) respondents during sample collection in order to achieve the objectives of the study. The study used the (SEM-PLS) program to investigate the relationship between external and internal variables. The results were summarized that blockchain and artificial intelligence (AI) technologies in their financial system significantly and positively affect the audit quality by providing assistance in auditing and fraud detection, which contributes to improving financial reporting. Blockchain and AI technologies in the financial system create confidence for investors and stakeholders.

A statement (AGGELINA LASKA, 2023) In his thesis, The Role of Internal Control in Detecting Money Laundering and Fraud in the FinTech Ecosystem, the thesis provides empirical evidence on the effectiveness of internal control functions in detecting and preventing money laundering and fraud in financial technology institutions. The study confirms On the role of big that Represented by Technology and Analysis to Data and risk assessment You can Control of activities Fraudulent And In a way anticipation Yes And enhances the ability the Companies which is used Fintech on The chest in the face of Activities Finance illegal.

while (Al-Shorman & Al-Zoubi, 2024) They built a model to evaluate internal control in industrial companies using artificial intelligence. The study aimed to demonstrate the possibility of building a model to evaluate internal control in industrial companies using artificial intelligence, based on the eight elements of internal control included in the model. ERM-COSO. The sample consisted of a group of audit department heads and auditors

in companies. The research used a carefully designed questionnaire tool along with a practical program developed specifically for the study. The main objective of the opening questionnaire was to collect relevant data that would facilitate the preparation of the conceptual model. The following questionnaire was formulated with the aim of obtaining the necessary data to evaluate the model that was created. A descriptive analytical methodology was used to clarify the phenomenon and statistically analyze the data collected, while an applied methodology was used simultaneously to build the research model. The results were extracted with an amazing accuracy of 98.6% by applying the decision tree algorithm.

In this regard (Guo, 2022) He did for Propose a method for evaluating the university's internal financial control based on artificial intelligence technology. First, introduce artificial intelligence technology in the application of internal financial control in colleges and universities, then build the internal financial organizational structure to meet the requirements of handling the huge workload, establish the evaluation of internal financial control in colleges and universities and at the same time use the financial system of the public service, and output the evaluation data of the university's internal control to the financial system. Use MData acquisition program that Related in Custom Report for Evaluation in order to Internal Financial Control Assessment in Universities and Colleges in shadow use Artificial Intelligence Technology Experimental results. I came to The evaluation is faster as the time to evaluate the basic elements increases., The effect of evaluation is the best; it is the closest also To the ideal value of 0.01 and the FDR curve is stable relatively.

foot (Chronopoulos et al., 2023) A comprehensive study of the impact of regulatory controlling changes on banking risks, using economic growth, regulatory exemptions and the Consumer Protection Act of 2018 as key elements. It was used Sample of Institutions Banking BHCS) covering the period from Q1 2015 to Q1 2020 found that risk increases for large bank holding companies affected by changes in regulatory controlling. In addition to increasing bank-level risk, affected bank holding companies increase their contribution to systemic risk. Bank holding companies also experience higher profitability, increased market valuations, and lower compliance costs. The results show that the reduction in regulatory controlling designed to reduce the regulatory and compliance burdens facing large banks has consequences, namely increased individual and systemic banking risk.

He also did (Aobdia & Shroff, 2017) Examining whether auditor regulatory controlling affects the value of financial statement audits. Using the PCAOB's International Inspection Program as a framework for generating within-country variation in regulatory controlling, We find that non-U.S. auditors inspected by the PCAOB gain a market share of 4% to 6% over competing auditors after the PCAOB's inspection reports are published. When inspection results reveal multiple deficiencies in the auditor's level of engagement, Market share gains following inspection reports are much smaller. Our evidence suggests that regulatory scrutiny increases the value of assurance provided by audit and highlights the role of general regulatory controlling in the audit market.

He explained (Professor & Catea Hashim, 2024) The effectiveness of external audit in enhancing control over the performance of investment projects and its impact on achieving transparency in the general budget. This research aims to analyze the effectiveness of external audit in enhancing control over the performance of investment projects. The research is based

on a theoretical analysis and a field study that included a careful review of secondary sources related to performance monitoring and its impact on monitoring the completion of investment projects in the general budget. A questionnaire was conducted for a sample of government units whose budgets include financial allocations for investment projects to obtain their opinions and experiences regarding performance monitoring. The research concluded that effective external audit directly enhances confidence among stakeholders, including investors, donors and citizens. This confidence is built on ensuring that funds allocated to investment projects are managed efficiently and in accordance with international standards. The most important recommendations were: To achieve comprehensive control over investment projects, it is necessary to enhance cooperation between external and internal audit and other regulatory bodies. The research results contribute to a deeper understanding of the importance of controlling the performance of investment projects and enhancing their financial performance.

Discuss (Bondarenko et al., 2021) Planning, Accounting and Control as Tools for Risk Management of Investment Projects in Small Businesses The purpose of this study is to develop scientifically sound proposals and recommendations for implementing planning, accounting and control tools in managing the risks of investment projects of small businesses. To achieve the objective of the study, methodological approaches were used to assess the sustainability of enterprise risks, based on an assessment of the resource potential of the enterprise. This study suggested system Indicators to Evaluation of the quality of enterprise resources. Theoretical and methodological approaches to the formation of an early warning system in risk management were developed. The authors proved that the risk prevention system should be integrated into the overall organizational structure and become part of the enterprise management system.

In this regard (Epishkina et al., 2023) They developed a system for automating the process of planning and monitoring the implementation of investment projects. This work is devoted to the development of a system for automating the process of planning and monitoring the implementation of investment projects in government agencies. The activities of public sector structures are strictly regulated by regulations, which in most cases correspond to the directive form of management. Such a process can be successfully automated by a set of algorithmic solutions. In particular. During the analysis it was found that the current organization of business processes in terms of planning and monitoring the implementation of investment projects in government agencies does not imply a single automated flow of work. The proposed system solves this problem by creating a single automated work process for all participants in the process and a single repository of data on investment projects. The study makes proposals for the development of a system for planning and monitoring the implementation of investment projects using coding IDEFO for business process design, IDEF1x notation for database design, and UML notation for creating architectural diagrams. The results of this study confirm that developing a system to automate the process of planning and monitoring the implementation of investment projects can help an organization increase the efficiency and transparency of investment projects.

Discuss (Ling & Min, 2019) Critical issues related to investment control in the project BT from the perspective of project governance where he studied the case of Metro Project, the

basic theory was used to identify the key points in the hierarchical structure in order to complete and improve the investment control system as well as study the mechanism of the influence of key factors on the investment control system, so the new Mode-BT project should study the control strength and help the government in a dominant position in the control of investment projects.

a statement (Dang et al., 2023) Factors affecting investment control in the form of public-private partnerships This study aims to identify the factors affecting investment control in build-operate-transfer (BOT) contracts. (BOT for road traffic infrastructure. Data were collected through in-depth interviews with (280) people who have experience in project management, PPP project management, and BOT project management and who are users of these services. After collecting the data, it was analyzed. The research results showed that: - Groups of factors such as legal framework, policy, and state administration affect investors, risk management, and supervision of BOT projects in infrastructure in Vietnam. The authors recommended a system of solutions to strengthen supervision of investment management in BOT projects.

He did (Li, 2023) Analyzing and monitoring financial data. He built Intelligent financial data analysis system based on(OLAP). Two models (logistic regression and decision tree algorithm) were selected as the operating algorithm of the system to complete the intelligent analysis of data by combining the random forest algorithm and the auto-regressive moving average model based on the idea of Bagging, and the financial status of energy projects after investment was evaluated to achieve the purpose of dynamic monitoring. Based on the results of monitoring and analyzing the financial data of renewable energy projects, the correct probability of intelligent analysis of financial data is 94.5%, 83.1% and 92.7% for different sample sizes of data, respectively, achieving a significant improvement in capital utilization efficiency, with the capital concentration increased by 30.42%, the inventory turnover rate increased from 10.68% to 13.04%, and the overdue accounts receivable rate increased from 60.31% to 67.83%. This method has proven to be able to help investors make greater use of uncertainty so as to improve the investment value of the project, thus providing investors with a new framework for thinking about decision-making.

Touched (Anand & Baird, 2024) To assess AI investment managers, how managers prioritize investments in AI with different autonomous capabilities. They present a taxonomy of AI based on two central dimensions of value creation (work autonomy and learning autonomy) and develop propositions that explain differences in AI investment valuation through the lenses of time-bound agency and AI delegation preferences. Their insights into how managers' time-bound trajectories and value creation preferences influence AI valuation provide a starting point for thinking about tensions managers face when considering AI investment options. The theory proposed here contributes to laying the foundation from which further AI investment research can be developed and provides opportunities for future research in AI valuation.

As searched (Sun, 2024) In the quantitative investment strategies based on artificial intelligence, this study focuses on exploring the cross-pollination of artificial intelligence with the Chinese stock market. The study is based on 7 types of factors, with a total of 29 factor indicators, covering multiple types of value, valuation, leverage, financial quality,

growth, technology, risk factors, etc. Through data pre-processing, feature engineering and other steps on the factors, and then combined with 8 machine learning algorithms to build corresponding quantitative trading strategies on 300 stocks.CSI. By comparing the results of different models, it is found that trading strategies generated by machine learning algorithms can achieve significant returns in the Chinese market. Except for Bayes Park Gaussian, the returns of the other seven model strategies outperform the benchmarks, among which XGBoost performs best, achieving a return of 20.10% and the smallest drawdown. He built a quantitative investment strategy using machine learning algorithms by researching and learning about knowledge related to quantitative investment and machine learning. This study provides investors with a way to build a strategy that integrates artificial intelligence into quantitative investment, and provides a valuable reference for improving subsequent investment decisions and practical application.

The study also came (Sutiene et al., 2024) To enhance portfolio management using AI, the study reviews the latest approaches by answering the fundamental question of how AI can transform portfolio management processes. Furthermore, given that the use of AI in finance is challenged by requirements for transparency, fairness and explainability, the study finally discusses recent regulatory developments in the European investment sector and highlights specific aspects of this work where explainable AI can enhance the transparency of the investment process.

While touching (Santos et al., 2024) On EU-funded investment in AI and regional specialization This research assessed the geographical distribution at the 2 level.NUTS for EU-funded investments in AI. It uses information on projects implemented by the main EU funding programmes: Horizon 2020 and Cohesion Policy during the 2014-2020 programming period. The results show that during this period, around €8 billion of EU funding was targeted for investments in AI in the European regions, which contributed around 7% of the total annual investment in AI in recent years. This study also examines the relationship between the specialization patterns of EU funds in relation to AI-related projects and regional characteristics. The research results show that more innovations and developments tend to show a higher specialization of public investment in AI-related activities.

In this regard, (Rodionova, 2024)In numbers Research on legal control of venture capital investment in Russia: contradictions and conflicts The research analyzes the current Russian legislation regulating relations in the field of investment in technology companies at the early and growth stage (venture investment), in order to identify gaps and contradictions in them. The general scientific method of analysis and the formal legal method were used. Results and discussion. Problems in the legal regulation of relations in the field of investment were identified. It is concluded that the effective development of venture investment is hampered by a number of legal obstacles, some of which relate to determining the legal status of participants in investment and risk relations, and some of which relate to problems in ensuring the implementation of transactions that bring the main benefits to venture investors. He explained (Volynets et al., 2024) A study titled Protection from the Exploitation of Artificial Intelligence in E-Commerce Investment Management aims to improve understanding of the problem of misuse when using artificial intelligence in e-commerce

investment management. This study examines the issues surrounding the use of artificial intelligence in investment and e-commerce and focuses on the widespread adoption of artificial intelligence and its benefits in the field of investment. E-commerce investment management may have an international dimension, raising questions about compliance with international standards and regulatory requirements in artificial intelligence. Artificial intelligence in e-commerce investment management offers many opportunities to improve the efficiency and accuracy of operations. However, it is important to ensure that such applications comply with legal standards, ethical principles, and security requirements. Only this approach will maximize the benefits of artificial intelligence in investment management while ensuring the legality and ethics of the use of the technology.

foot(Khatijah et al., 2023) In his study Automated system to Y Help investors who They are planning.to make investments to Provide features to evaluate the financial performance of specific companies. And Makers And Certain. The authors proposed two strategies: TOPSIS and Fuzzy Logic approaches The successful automated system has been developed using these approaches. Investors can freely choose between a set of performance evaluation criteria to determine the ranking. Investors can see how companies rank in terms of their financial performance. Investors can also avoid being overwhelmed by complex, and possibly conflicting, web information by using the existing systems. The proposed system is very easy to use and has been able to help investors in making investment decisions. It is worth mentioning that the developed systems can be of great benefit not only to investors but also to students who are enrolled in business management courses.

As suggested(Xiong et al., 2021) Use of technologyG5 combined with big data, artificial intelligence, situational awareness, and video recognition technology to create a 3D visualization platform for construction site information.

He explained (Engku Abdullah et al., 2024)Factors Influencing FinTech Adoption in Investment Among Malaysians This study investigated the impact of FinTech adoption factors on Malaysians' investment FinTech on investment, FinTech's potential to reduce costs, enhance human resource efficiency, and increase customer satisfaction, This study used the Unified Theory of Acceptance and Use of Technology (UTAUT) framework. This study helps individuals in the financial services industry align their organizational goals with the development of digital financial ecosystems. The comprehensive development of FinTech is essential for investment management that includes value aggregators, advisors, and competitive access facilitators in light of the increasingly challenging digital technologies landscape. Effective and systematic investment services and in-house FinTech capabilities can be combined across the investment landscape of external innovations, service providers, and advice facilitators. The study used a questionnaire approach to collect empirical information on the use of financial technology (FinTech) in investment among Malaysians. Both descriptive and inferential analyses were conducted. The research revealed a significant impact of performance expectancy, effort expectancy, and social influence on behavioral intention.

As it came (Mohamad et al., 2018) Study on the adoption of financial technology (Fintech in Mutual Fund/Unit Fund Investment Trust Among Malaysians: A Unified Theory of Acceptance and Use of Technology (UTAUT) The study aims to determine the level of

FinTech adoption in Mutual Fund/Unit Fund investment among investors in Malaysia. The objectives of this research are: 1) To ascertain the degree of awareness of FinTech application in Mutual Fund/Unit Fund investment,

2) Study bezel Accreditation Fin Tech)) in investing in unit funds / mutual funds,

Goals explore howHe does FinTech)) has changed the customer base in terms of the extent to which Malaysians have adopted FinTech so far. The methodology of this research was conducted on the adoption of FinTech in mutual funds/unit funds through a questionnaire. This study helps participants in financial services management to take advantage of the opportunities provided by FinTech services. The implementation of FinTech will provide improvement and transformation of services in investment management services in the future.

As discussed (Harjoto et al., 2018) Board Diversity and Corporate Investment Controlling This study examines the relationship between board diversity, measured in both a relationship-oriented dimension (i.e., gender, race, and age) and a task-oriented dimension (i.e., tenure and experience), and board performance in corporate investment controlling. The study assesses investment by measuring the extent to which firms deviate from the expected level of capital expenditures, R&D expenditures, and acquisition spending within their industry. Using a sample of 15,125 firms from 1998 to 2014, they find that task-oriented diversity attributes, such as tenure and experience, are negatively associated with suboptimal investment, suggesting that boards that are diverse in terms of firm-specific experience and functional expertise are more effective in overseeing corporate investment activities than homogeneous boards. The results highlight recent regulatory requirements on board diversity and recommend further task-oriented exploration.

He also did (X. Ma et al., 2024)By examining the influence of chief accountant, a government official holding a leadership position in state-owned enterprises, on investment efficiency, our study uses the gradual implementation of chief accountant positions as a quasi-natural experimental framework to conduct a difference analysis. Using data from China,The study reveals having a relationshippositive impactbetweenPresenceSenior Accountant and Corporate Investment EfficiencyIt is also shown through analysisThe participation of the chief accountantRelatedAt cost Agency,and information environmentAlsoInternal controls and levelIcash flow In heteroskedasticity tests, we observe a more pronounced positive effect of the chief accountant on the investment efficiency of firms, the average investment efficiency (Inveff) is -0.049 with a standard deviation of 0.052 , which confirms the low investment efficiency of listed Chinese companies. The mean CA is (0.090) and the standard deviation is (0.287) indicating that the implementation rate of the chief accountant system is not high and the distribution is relatively discrete. The research provides objective empirical data on the discourse surrounding financial leadership and corporate governance in developing economies. Using a difference-in-differences methodology, we find a positive association between the appointment of chief accountants and improved investment efficiency, especially in state-owned enterprises undergoing ownership transitions and facing intense shareholder scrutiny. The results confirm the strategic value of integrating financial leadership into the governance structures of state-

owned enterprises and indicate that chief accountants play a pivotal role beyond traditional accounting functions, which has an impact on strategic decision-making.

compare (Nguyen, 2021) In a study on the control of banking risks by audit committees and Sharia committees: Conventional banks versus Islamic banks, this paper uses data from Focus Bank Orbis Bankscope, a global database containing data on both listed and unlisted banks for the period 2002-2018. Using fixed-effect estimations and a general variable model for a sample of 57 Islamic banks and 102 conventional banks from 10 countries for the period 2002-2018, we examine the impact of the effectiveness of audit and sharia committees on banks' risk-taking behavior and their transmission mechanisms. The results reveal that audit committee independence, number of meetings, and financial expertise negatively affect banks' risk-taking behavior, suggesting that the high effectiveness of their audit committees may constrain banks' risk-taking activities. With a different transmission mechanism, the proportion of female members and financial expertise in sharia committees negatively affect risk-taking, but the size of the sharia committee positively affects risk-taking in sharia banks. research (Hu & Li, 2024) In a study on benefits and labor investment efficiency in China, this study examined the impact of benefits on future labor investment efficiency. Agency theory suggests that benefits motivate managers to distort investments for personal gain. In contrast, incentive contract theory suggests that benefits can be a component of incentive contracts, encouraging managers to invest in the interests of shareholders. Based on a sample of 12,818 firm observations from 2009 to 2017, we find that benefits are positively related to future labor investment inefficiency, consistent with agency theory. Finally, the study finds that benefits and labor investment inefficiency harm firm value.

to focus (Zheng et al., 2024) Studying Compliance Management and Investment Efficiency in State-Owned Enterprises: Evidence from China: The sample was constructed using all listed Chinese state-owned enterprises for the period 2015-2022.

Taking advantage of the implementation of compliance management guidelines issued by corporate regulatory and supervisory bodies in China, they constructed a quasi-natural experiment to examine the impact of implementing these guidelines on investment efficiency in state-owned enterprises. rose Investment efficiency in State owned companies Very much Very especially after What has been implemented? Guidelines And the impact He was More clarity on companies It is owned by the state. That She has to suffer from Financing restrictions Majorand financing requirements High And competition Big In the product market, The guidelines also Help To improve investment efficiency in order to reduction desire Risk Management what a little Problems Of the first type And enhance the level of internal control. The study concluded Compliance Management verification strategy Of great importance for Enhancing investment efficiency in state-owned enterprises.

Analyze (Saba & Pretorius, 2024) The impact of investment in artificial intelligence on human well-being in G7 countries based on governance indicators/dimensions within G7 countries from 2012 to 2022 using the distributed lag augmented autoregressive technique (ARDL-CS) Based on the findings, policymakers should prioritize integrating AI investment into governance to enhance human welfare in the short and long term. However, caution is needed when considering the interaction of AI investment with corporate governance, as it has not supported human welfare. While AI investment and governance quality in general

appear promising, it is important to implement safeguards against potential negative effects of the interaction between AI investment and corporate governance on human welfare. The results indicate that the interaction between AI investment and explanatory variables such as public governance, political governance, and economic governance has a positive and significant effect on household governance and infrastructure at the 10% significance level in both the short and long term. While the interaction between AI investment and corporate governance has a negative and significant effect on household governance and infrastructure at the 10% significance level in both the short and long run, a 1% increase in the interaction between AI investment and explanatory variables such as public governance, political governance, and economic governance increases HWBG by 0.0070%, 0.004%, and 0.000% in the short run and by 0.0070%, 0.004%, and 0.000% in the long run. It is shown that when AI is leveraged in conjunction with improvements in public governance, political governance, and economic governance, there are positive effects on HWBG in both the short and long run. These results highlight the potential benefits of using AI technologies in a well-governed environment, which may contribute to the well-being of individuals and society as a whole.

In a scientific article by (Abdulai et al., 2024) On the impact of governance on investment: The study uses six indicators of institutional quality, as defined by Kaufman et al. (2009), to assess the quality of governance. These indicators include control of corruption, political stability, rule of law, accountability, government effectiveness and regulatory quality. A database was used WGI is used as a measure of governance quality in this paper because it assesses the effectiveness and efficiency of government work using the following indicators: government effectiveness, regulatory quality, and rule of law using a sample of forty-one (41) countries between 2002 and 2021 using the GMM system. Using seven proxies for institutional variables, the results showed that all institutional proxies had a positive and significant impact on private investment and a negative impact on public investment. The average value of institutional quality variables is as follows. The average value of anti-corruption is 38.439, the average value of rule of law is 37.623, the average value of government effectiveness is 36.053, the average value of political stability is 39.42, the average value of regulatory quality is 38.299, and the average value of accountability is 40.212. The average values of institutional variables indicate that the institutional development in the sub-region is relatively low, especially when minimum figures of 13.984 are recorded for political stability. It is worth noting that accountability recorded the highest average rating in the sub-region, while government effectiveness recorded the lowest average value.

In a research article by (C. Ma et al., 2022) How can we reduce the phenomenon of collusion between contracting companies at different levels (vertical collusion) in government tenders? What mechanisms and policies can be adopted to direct investment to determine future groups aiming to study the impact of social factors on the decisions of participants in the auction, predicting trends of collusion and using a modelObjective LDA in the process of constructing indicators, and analyzing control cases using the fsQCA method In this study, the fsQCA method was used on data from 166 governance cases in 31 Chinese localities in different periods and under different conditions. Thus, the effects of each variable on the

quality of collusion control were evaluated based on their different combinations. From the results of the single factor analysis, it was found that a lower degree of market competition is necessary to improve the quality of control from a set of conditions, and it was found that several paths affect the quality of vertical collusion control, and the improvements depend on choosing different methods for different situations. Based on the five paths reached from the analysis, suggestions are made, the most important of which is that the government should strengthen internal and external supervision and give full play to supervision mechanisms. Consideration should be given to building a national-level blockchain and BIM-based bidding management and payment system. The government should encourage the application of blockchain and BIM in bidding management to enhance trust and transparency in the process.

5- Discussion:

This section provides observations on AI-powered controlling and its implications for investment management based on the literature review presented above, followed by identification of the literature gap and future recommendations in this area.

The results show a significant increase in the number of high-impact publications related to the topic of artificial intelligence, regulatory systems and investment management over the past decade. According to the results, the investment projects sector is the sector most affected by artificial intelligence due to the complexity of the possibility of controlling large investment projects. Selected studies suggest different ways for artificial intelligence to assist in the control of investment projects. The enormous potential of artificial intelligence technologies is significantly reflected in the professional development of planning and measurement, where a large amount has been allocated to the control work supported by artificial intelligence. Artificial intelligence analyzes extensive financial data to make informed investment decisions.

Moreover, artificial intelligence opens new horizons to improve the effectiveness of investment projects, as the technologies used enhance analytical and predictive capabilities, allowing investors to make more accurate decisions. It also contributes to improving the quality of planning processes, as it enables risk prediction and data analysis to take immediate action to address challenges and improve the efficiency of forces and leaders in investment projects. The presence of a strong structure for internal audit functions, policies and guidelines is essential to benefit from artificial intelligence opportunities. Artificial intelligence supports the control function in reducing analysis based on manual procedures, and providing additional, extensive audits. The way of doing business has become more complex than before, due to advances in technology and immediate improvements in the way of operations

Moreover, the concepts of generative artificial intelligence have attracted (AI) and artificial intelligence (AI) have attracted a lot of attention, and Chat GPT's success in attracting all the attention has undoubtedly played an important role in this. AI technology has a profound impact on all sectors, and AI in e-commerce investment management offers many opportunities to improve the efficiency and accuracy of operations. However, it is of utmost importance to ensure that such applications comply with legal standards, ethical principles,

and security requirements. Only this approach will maximize the benefits of AI in investment management while ensuring the legality and ethics of the use of the technology.

6- Conclusions:

This research aims to understand how to classify studies related to the application of artificial intelligence in the field of supervision and investment management, and to identify artificial intelligence techniques that have contributed to enhancing supervisory systems, with the aim of finding solutions to move to optimal and efficient investment management and a tight, unbiased supervisory system that accurately identifies deviations in record time away from manual procedures to keep pace with technological development in the world or rather the great digital transformation in this era.

According to the literature, AI technologies have been developed to serve the various auditing and controlling fields in the investment sector and others.:

- Artificial intelligence turns out to be analyzing data. The big one To make informed investment decisions.
- Artificial intelligence opens new horizons to improve the effectiveness of investment projects, as the technologies used enhance analytical and predictive capabilities, allowing investors to make more accurate decisions and also contribute to improving the quality of planning processes.
- A Artificial intelligence supports the internal audit function of institution.
- order the My effective supervision It directly enhances the trust between stakeholders, including investors, donors and citizens, and this trust is built on ensuring that funds allocated to investment projects are managed efficiently and in accordance with international standards.
- Developing a system to automate the planning process and monitor the implementation of investment projects can help increase efficiency and transparency in investment projects.
- Building a control model supported by artificial intelligence technologies It helps investors better leverage uncertainty to improve the investment value of a project, providing investors with a new way of thinking about decision making. It also helps senior management monitor investment projects to identify deviations accurately, reliably, in record time and with minimal effort.
- Using artificial intelligence techniques in the context of Censorship and Management contributes to the well-being of individuals and society as a whole.
- Techniques such as machine learning, neural networks, and genetic algorithms are emerging. (GA), expert system, ant algorithm (ACO), support matrix (SVM-GA), deep learning (DL), decision tree, computer vision (CV) and expert systems (ES) are showing promising utility in planning, duration estimation, effort estimation, task scheduling, human resource assignment, resource allocation, and project cost estimation.

Therefore, the presented research contributes theoretically to the literature on digitizing investment management control by providing an understanding of how to improve investment management. Practically, this research will make investment management aware of the potential of investment projects and the extent of their progress and procrastination.

However, there is a lack of studies in developing comprehensive frameworks for AI-enabled regulatory systems that take into account project lifecycle professional development, sustainability and security, which remain future research tasks.

Some researchers used the questionnaire as a research tool, others used interviews and many techniques such as machine learning technology. Google Gemini, ChatGPT, simulator, decision tree algorithm, G5 technology, big data, AI, video recognition technology, smart programs, and a proposed method or system development, as shown in Table No. (1): -

Table: 1

researcher	Year	Roads	Database	Results	Disadvantages	Benefits
Sanchez	2020	Questionnaire + Interview	General	It was found that the internal operations of companies depend on traditional methods of data analysis.	The sample is small as it was limited to 9 companies.	Providing guidance for companies that do not have a specific roadmap for implementing AI technologies in their work.
Karthika and others	2023	techniqueML	General	AI technologies enable businesses to analyze big data to make accurate decisions.	-	Harnessing the benefits of AI technologies to propel businesses to a successful future
Abuzabiba and others	2024	poll	General	Artificial intelligence improves the effectiveness of investment projects	Technical and ethical challenges are not addressed.	-
Wassie & Lakatos	2024	Literature review	General	AI technologies support internal control function	-	Provide an outline of literature search methods and propose a framework for using AI techniques.
Damar et al	2024	Google Gemini, ChatGPT	General	Artificial intelligence technology has a profound impact on all sectors.,There are four areas of application for AI in the public sector: service delivery, efficiency and automation, ethical and regulatory challenges, and data-driven governance.	-	Statement on the feasibility of applying artificial intelligence in surveillance in many sectors
Vinokurov & Sadvovskaya	2023	Interviews + Simulator	General	The result of economic activity with artificial intelligence as an advisor was higher accuracy than the group who followed the advice of the human advisor.	No assessment has been made of the personal factors that influence attitudes towards AI.	-
Qader & Cek	2024	programsIm-pls	Questionnai re	Technology affectsBlockchain and AI on Audit Quality and Controlling through Proactive Fraud Detection	-	-
Al-Shorman & Al-Zoubi	2024	Decision Tree Algorithm	Build a model + questionnair e	The use of the decision tree algorithm among the techniques used reaches the highest accuracy, reaching 98.6%.	-	He analyzed the results inspps and compare it with the results of the artificial intelligence analysis
Guo	2022	Suggest method a	Data from the evaluation report	Evaluation using artificial intelligence techniques is more accurate, efficient and faster.	-	-
Professor & Catea Hashim	2024	poll	Field study	An effective external auditor enhances the confidence of the management of funds in investment projects.	-	Understand the importance of monitoring the performance of investment projects and enhancing their performance
Epishkina and others	2023	System development	General	The system helps organizations increase efficiency and transparency in investment projects.	-	Automation and planning of investment projects will lead to achieving the goals
Ling & Min	2019	Case Study	-	Provides important guidance for decision-making on the controlling of public sector investment projects.	-	-
Volynets et al	2024	Historical method + analytical method	General	Artificial intelligence provides many opportunities to improve the efficiency and accuracy of operations.	-	Ensuring AI technologies comply with laws and ethical principles
Xiong et al	2021	technique G5, big data, AI, video recognition technology	Smart location system application	Implementing a smart construction site supported by modern technologies reduces risks, improves work accuracy, enhances design efficiency and lowers overall costs.	-	-

There are also many techniques in artificial intelligence that can be used in the field of control and investment management, with their main uses and expected benefits specified as in Table No. (2):

Table No. (2)

Technology	Main use	Benefits
Machine Learning	Analyze data, predict risks, and detect abnormal patterns.	Reduce human error and increase decision-making accuracy
Natural Language ProcessingNLP	Analyze legal documents and texts.	Reduces the effort of traditional analysis and increases efficiency
big data analytics	Extract information and insights from large amounts of data.	Improve investment strategies and reduce costs.
Neural Networks	Forecasting future trends and trend analysis	Improve forecast accuracy to develop a proactive strategy
Robotic Process Automation	Automates routine processes such as auditing and report analysis.	Speed up processes, reduce costs and increase efficiency.
Blockchain technologyNPowere by AI blockchain	Enhances security and credibility in financial transactions	Improve transparency and prevent manipulation.

Source: Prepared by the researcher

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