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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON IMPROVING SMART MANAGEMENT: AN APPLIED STUDY AT THE MINISTRY OF DIGITAL ECONOMY AND ENTREPRENEURSHIP IN JORDAN.

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1. Introduction

The concept of Artificial intelligence (AI) has become one of the most popular concepts in the field of computer technology in recent times. It is a tool that has achieved significant scientific innovations and tangible realities. It has impacted all fields and aspects of business, becoming a general topic for all segments of society. Its global market is expected to continue to grow significantly every year. In this article, we explain the definition of artificial intelligence, its mechanism of action, its importance, characteristics, fields, stages of application, ideas, and categories. (Antikazinov, 2023)

Artificial intelligence technology is used to create a computer or robot that acts under the control of a program that thinks intelligently, like the human mind. Artificial intelligence is achieved after conducting numerous studies of human brain patterns and analyzing cognitive processes. Intelligent programs and systems are then developed. An artificial intelligence concept map is a visual diagram containing various ideas or concepts and showing the relationships between them. These concepts appear as nodes, interconnected by lines or arrows. An AI concept map provides a visual framework that helps analyze information, exchange ideas, and solve problems. This map can be created using AI-powered tools, or even manually. (Sayeda, 2025)

Smart management also relies on the use of technology and data analysis to make better and innovative decisions, enhancing the learning experience and improving the performance of public and private organizations in general. Leveraging Data: Smart management in organizations relies on collecting data from various sources. In light of rapid digital developments, smart business management applications have become an essential element in the success of organizations and achieving operational efficiency. These applications provide advanced technical solutions that enable companies to manage their resources, improve productivity, and enhance their competitiveness in the market. These applications rely on AI technologies, data analysis, and cloud storage to provide accurate insights that help make strategic decisions faster and more accurately. (Almieda, 2024)

The value of AI is most evident in the field of public utility management. Transforming traditional management into smart management through digitization and electronic storage of documents or files enables faster response times for beneficiaries of public utility services, and they feel they are dealing with professional and innovative management. Artificial intelligence is not just a passing technology; it is a revolution in the world of technology. It is important to be prepared to adapt to the changes it will bring and to harness this technology to improve our lives and solve problems. By understanding the potential and challenges, we can achieve a better and more sustainable future (Yuan, 2005).

Therefore, this study aims to determine the impact of using artificial intelligence on improving and developing smart management at the Ministry of Digital Economy and Entrepreneurship in the Hashemite Kingdom of Jordan.

1.1 StudyProblem

To avoid the potential negative impacts of artificial intelligence, societies and governments must take deliberate steps. These steps include: Education and Training: Educational and training programs must be provided to prepare individuals to work in an environment increasingly dependent on artificial intelligence. Legislation and Policies: Legislation and regulatory policies must be put in place to ensure the ethical and responsible use of artificial intelligence. Research and Development: Research and development in artificial intelligence must be supported to ensure this technology develops in ways that benefit everyone. Awareness: The public must be educated about the uses, benefits, and risks of artificial intelligence to avoid unjustified fear and deal with it realistically. Therefore, the Ministry of Digital Economy and Entrepreneurship in Jordan needs to utilize technologies that are scientifically and methodologically compatible with artificial intelligence so that it can develop a smart administration capable of achieving the state's vision and mission of providing services to citizens at a quality and cost that matches their financial situation. Therefore, this study addresses the following question: "Do artificial intelligence elements contribute to the development and improvement of smart management in the Ministry of Digital Economy and Entrepreneurship in Jordan?" The elements of the study problem can be derived as follows:

1- What is the impact of computer networks on improving smart management in the Ministry of Digital Economy and Entrepreneurship in Jordan?

2- What is the impact of continuous computer development on improving smart management in the Ministry of Digital Economy and Entrepreneurship in Jordan?

3- What is the impact of artificial intelligence technologies on improving smart management in the Ministry of Digital Economy and Entrepreneurship in Jordan?

1.2 Study Hypotheses

Based on the study problem, the following hypotheses can be formulated:

1- There is no statistically significant impact of computer networks on improving smart management in the Ministry of Digital Economy and Entrepreneurship in Jordan.

2- There is no statistically significant impact of continuous computer development on improving smart management in the Ministry of Digital Economy and Entrepreneurship in Jordan.

3- There is no statistically significant impact of artificial intelligence technologies on improving smart management in the Ministry of Digital Economy and Entrepreneurship in Jordan.

1.3 Study Objectives

The study seeks to achieve the following objectives:

1- Find Tools for conceptual linking between artificial intelligence and smart management to arrive at a theoretical framework that addresses the similarities and differences between them.

2. Conduct a field study based on linking the theoretical framework to the practical reality of artificial intelligence elements to improve smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan.

3. Assist analysts and researchers in developing a theoretical and practical reference for how to improve smart management through artificial intelligence technologies and elements.

4. Identify the impact of computer networks, artificial intelligence technologies, and computer-based continuous training on developing the mechanisms, efficiency, and effectiveness of smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan.

1.4 The Importance of the Study

The importance of the study stems from the following:

1. Artificial Intelligence **(AI)** is one of the most important modern technologies that significantly contributes to rapid technological development and increased opportunities for innovation and growth in the provision of various electronic services to citizens. AI plays a significant role in enhancing quality, increasing capabilities and business efficiency, and improving productivity, thereby improving the quality of government e-services.
2. AI technologies provide numerous benefits to society and the economy, including improving operational efficiency, promoting innovation, reducing errors, assisting in risky tasks, and addressing complex global challenges. Operations have become smarter and more efficient, enhancing productivity and profits.
3. The importance of the Ministry of Digital Economy and Entrepreneurship lies in its pivotal role in leading the Kingdom's digital transformation, regulating and developing the technology and innovation sector, and supporting entrepreneurship to build a thriving digital economy. The Ministry works to develop digital infrastructure, develop citizens' digital skills, and provide a regulatory and legislative environment that supports the growth of digital businesses, enhancing the Kingdom's competitiveness and achieving the goals of the Economic Modernization Vision.
4. Artificial intelligence is used in a range of areas within the government. It can be used to advance public policy objectives (in areas such as emergency services, health, and social care), as well as assist the public in interacting with government (through the use of virtual assistants, for example).
5- One of the most important benefits of smart management is facilitating administrative procedures, increasing transparency, and enhancing community participation. E-government refers to the use of information and communications technology (ICT) to enhance and support the delivery of government services, improve the efficiency of government operations, and facilitate citizen participation in the democratic process.

1.5 Previous Studies

Ghazi and Al-hosban (2025) study, "The Impact of Artificial Intelligence on the Development of Internal Auditing"

The study aimed to determine the extent of the impact of artificial intelligence tools on reducing time wasted in the internal audit process in public universities. It also aimed to determine the impact of computerized documentation as evidence for the internal auditor's report. The study relied on a questionnaire distributed to internal auditors at the University of Mosul in Iraq. Among the most important findings of the study are: Artificial intelligence tools in public universities helped reduce the time required for the internal audit process, and artificial intelligence tools have a positive impact on the effectiveness of obtaining audit evidence. Among the study's most important recommendations are: the need to expand the use of artificial intelligence applications in internal audit work and provide the necessary recommendations for developing work mechanisms. The study also calls for continuing computer-based training courses that link internal auditing with artificial intelligence to improve the quality of services provided by internal audit to company management.

Yuan's (2025) study, "The Impact of Artificial Intelligence on Digital Government"

The study aimed to determine the impact of using artificial intelligence mechanisms on providing high-quality digital services to citizens. This study uses data from cities at the governorate level. And above in China to systematically examine the impact of AI development on the effectiveness of government digital services, further exploring its underlying mechanisms and contextual modifiers. Among its most important findings: AI has a positive impact on increasing the capacity to provide digital services, and it also demonstrated the ease of exchanging information and data necessary for government decision-making. Among its most important recommendations: working to enhance and support the capacity of government employees to use AI mechanisms and technologies, and the necessity of continuous qualitative training using modern technology.

Kasa's (2025) study "The Impact of Artificial Intelligence on Organizational Performance" aimed to determine the impact of artificial intelligence on organizational performance through an intervening factor, worker productivity. It also aimed to provide a comprehensive view of the study's elements and variables. The study relied on an observational approach to worker productivity. Among its most important findings: a positive relationship between artificial intelligence and worker productivity, and a positive relationship between worker or employee productivity and organizational performance. The results showed an expansion in the use of artificial intelligence in various decision-making. Among its most important recommendations: the need to consider other factors, such as the level of technology or ongoing training, to determine the relationship between artificial intelligence and organizational performance.

Sirinivasan's (2025) study, "The Impact of Using Artificial Intelligence in Decision-Making in Project Management," aimed to determine the impact of artificial intelligence on decision-making in terms of opportunities and risks. The study relied on observation to collect data by observing managers at various administrative levels and from various projects using artificial intelligence tools to improve the quality of administrative decisions.

Ahmed's (2022) study, "The Impact of Using Artificial Intelligence in Administrative Decision-Making," aimed to determine the impact of artificial intelligence on improving and developing administrative decisions so that decisions are error-free and help improve strategic plans. The study relied on a deductive approach by referring to regulations and instructions from both the state and the company to achieve the study's objective. Among its most important findings are the positive impact of computer networks or mechanisms for communicating the information necessary for decision-making, and that computerized decisions are not subject to time and space constraints. Among its most important recommendations is the need to expand the use of other artificial intelligence tools to improve decisions, and to diversify studies through questionnaires or interviews to obtain a comprehensive view of computerized intelligent decision-making.

1.5.1 The current study differs from previous studies:

1. This study relies on examining variables not found in previous studies, such as computer networks and smart management.
2. This study links artificial intelligence with smart management through the combination of artificial intelligence and smart management elements.
3. This study relies on a questionnaire to obtain primary data from the study population and sample.
4- It should be applied to the most important ministry concerned with artificial intelligence and AI applications, namely the Ministry of Digital Economy and Entrepreneurship in Jordan.

5- It takes into account the variable of smart management as one of the study variables that was not considered in previous studies.

2. Theoretical Framework

2.1 Artificial Intelligence(AI)

2.1.1 Introduction

Technological development has led to the use of artificial intelligence in all areas of the business environment, to the point that artificial intelligence has become a competitive advantage for business organizations. Accounting and auditing are considered among the most important fields in the business environment. Despite the transfer of artificial intelligence to the fields of accounting and auditing, its objectives have not changed with the entry of information technology into its scope of work. However, the method by which evidence is collected and evaluated, the methods of modeling and selection of audit samples, the methods of assessing audit risks, and the preparation of reports within the organization have changed, which may differ completely from the traditional environment to the electronic environment (Saad , , 2022). It has become imperative for organizations in general, and the state in particular, to reconsider and update their management methods to ensure their continuity by adopting artificial intelligence applications that allow for the development of new and innovative working methods that meet customer expectations and needs and provide competitive services, not only to maintain but also to develop their competitive advantage. The trend towards simulating human intelligence is one of the most prominent current technological developments that banks seek to adopt with the aim of reducing operational costs and strengthening customer relationships, which will positively impact their performance and achieve their multiple goals (Ali, 2023).

2.1.2 The Concept of Artificial Intelligence

- Artificial intelligence is defined as the technology that harnesses human capabilities to learn and solve problems. Its goal is to develop advanced technology that relies on human intelligence by understanding large amounts of data and converting it into information that aids decision-making.(Ankita , 2024)
- Artificial intelligence (AI) is the technology that enables computers and machines to simulate human learning, understanding, problem-solving, decision-making, creativity, and autonomy.(Brynjolfsson , 2017)
- Artificial intelligence is the process of developing advanced and complex systems capable of surpassing human capabilities in various fields (Venkateswaran et al., 2024).

We conclude from the above that, as AI significantly transforms the field of project management, there are ways in which it can transform the project management industry by streamlining every process, enhancing predictive analytics, and enabling better decision-making at every step.

2.1.3 Artificial Intelligence Applications

AI can be applied in the following areas:(Oberg , etals , 2019)

1. Therapeutic: Through accurate diagnosis of health issues and the use of neural networks.
2. Educational: Through providing smart teaching tools for students and providing important recommendations to trainers to improve work performance and enhance the quality of education.
3. Business and commerce: Through more efficient resource management, machine learning techniques help analyze big data to provide accurate forecasts of future orders and inventory management. In addition, AI-powered chatbots provide efficient and rapid customer service, improving customer experience and reducing costs.

2.1.4 Risks of Artificial Intelligence

There are risks and challenges associated with AI, including: (Wu , etals , 2019)

1. Job loss and increased poverty and unemployment due to robots replacing humans.
2. Privacy and security, due to the possibility of personal information being hacked and illegally modified remotely using AI.
3. Bias and fairness: AI systems may suffer from bias based on the data they were trained on, leading to unfair or discriminatory decisions.
4- Ethics: Artificial intelligence raises questions about ethical responsibility, especially in sensitive applications, such as self-driving cars and drones.

2.1.5 AI tools in business management

Can be summarized as follows:(Arrevalo , 2024)

1- Data analysis and prediction tools: Companies rely on data analysis tools to interpret massive amounts of information and transform them into actionable insights.
2- Human resources tools: Human resources management has become smarter through tools based on behavioral analysis and performance prediction.
3- Intelligent marketing tools: Marketing has become more accurate and effective thanks to AI tools that understand audiences and predict customer behavior.
4- Chatbots and customer service: Chatbots are one of the most important applications of AI in customer service, reducing costs and improving response speed.
5- Process automation (RPA) tools: Automated process bots rely on artificial intelligence to replicate routine tasks and improve efficiency.
6- Performance monitoring and intelligent reporting tools: With tools like Looker Studio and Sisense, managers can track performance in real time and generate accurate reports supported by intelligent analytics.

2.1.6 The Importance of Using Computer Networks in Artificial Intelligence

It can be summarize as follow (Ferandaze , etals , 2019)

1. Increasing the stability and reliability of computer networks and their reliance on information sources
2. Ease of electronic reporting of errors in the content or components of networks in general
3. Increasing the highest levels of security, safety, and privacy of information if artificial intelligence is applied to a large extent
4. Reducing expenses incurred on spare parts, maintenance, or installation costs for computer networks
5. Improving the quality of service or product for the end user in terms of price and quality

2.1.7 The Importance of AI-Powered Smart Management Processes:

Artificial intelligence (AI) has emerged as a revolutionary force in the management field, revolutionizing established technologies and opening up new horizons for businesses. AI-powered smart management processes offer numerous advantages that enhance a company's success and competitiveness (Shukla, 2024).

- Improved Decision-Making: AI technologies enable accurate data analysis, allowing managers to make more informed decisions. AI can detect patterns, correlations, and trends in massive amounts of data that human decision-makers may not see. Data-driven decision-making leads to better strategic choices, optimized resource allocation, and improved performance outcomes.
- Automation and Efficiency: AI-powered smart management processes automate time-consuming and repetitive chores, freeing up human resources to perform more profitable and

challenging tasks. Organizations can improve operational efficiency, reduce errors, and accelerate task completion by automating routine procedures. Employees can then focus on higher-value jobs that require creativity, critical thinking, and problem-solving.

- Predictive Analytics and Forecasting: AI systems can analyze historical data to produce accurate forecasts and predictions. Organizations can use this skill to predict market trends, customer behavior, and demand patterns. Businesses can also use predictive analytics to proactively respond to market changes, optimize inventory levels, and reduce risk. This helps improve resource planning, reduce costs, and increase customer satisfaction.
- Personalized Customer Experiences: AI-powered solutions, such as chatbots and virtual assistants, enable businesses to deliver personalized customer experiences at scale. These systems can understand and respond to customer inquiries, provide recommendations, and assist with the purchasing process. AI-powered customer relationship management (CRM) improves customer satisfaction and loyalty by providing personalized interactions and efficient support.
- Process Optimization and Resource Allocation: AI can optimize business operations by detecting inefficiencies, bottlenecks, and opportunities for improvement. AI algorithms optimize workflows, save costs, and improve resource allocation through data analysis and trend recognition. As a result, operational performance, productivity, and resource utilization are improved.

2.1.8 The advantages of artificial intelligence in business organizations

can be summarized as follows:(Khattat , etals , 2024)

1. Increasing the efficiency and accuracy of future forecasts. This is achieved through the use of advanced algorithms capable of handling and processing massive amounts of diverse data at exceptional speed, enabling the financial and competitive position of projects to be accurately predicted.
2. Reducing costs: Artificial intelligence has an impact on reducing waste costs, which positively impacts a company's market continuity.
3. Marketing services and products: Through computer networks and e-marketing, reaching targeted customers and determining optimal pricing.
4. Studying customer desires and needs for the goods and services provided to them through the use of social media tools.
5. Improving business efficiency and computerized commercial security through reliance on reliable, trustworthy, and dependable computer networks.

2.2 The rise of smart management processes powered by artificial intelligence.

The following are the key aspects that have contributed to the rise of smart management processes powered by artificial intelligence:(Ankita , 2024)

- Data analytics and big data: The massive expansion of data generated by organizations, along with the availability of powerful data analysis tools, has facilitated the emergence of intelligent management processes powered by artificial intelligence. AI technologies have the ability to analyze massive amounts of structured and unstructured data, uncover hidden patterns, and extract important insights. Organizations can make more informed decisions and develop effective strategies using this data-driven approach.
- Machine Learning Breakthroughs: Machine learning, a branch of AI, has seen significant breakthroughs in recent years. Algorithms such as neural networks, deep learning, and reinforcement learning have become increasingly powerful and capable of handling complex tasks. Machine learning algorithms can learn from data, recognize patterns, predict, or act upon

them. This capability has enabled the creation of AI-powered intelligent management processes that automate tasks, provide intelligent recommendations, and optimize operations.
- Computing Power and Cloud Infrastructure: The availability of high-performance computing resources and cloud infrastructure has played a critical role in the development of AI-powered intelligent management processes. These technologies provide the computing power and storage capacity needed to train complex AI models and process massive datasets. Cloud-based AI systems have made AI accessible to businesses of all types, allowing them to leverage AI capabilities without requiring significant upfront investments in hardware or infrastructure.
- Internet of Things (IoT) and Connectivity: The proliferation of IoT devices, coupled with increased device connectivity, has led to the emergence of massive networks of interconnected devices and systems. AI-powered smart management processes can monitor operations, optimize resource allocation, and enable predictive maintenance by leveraging data from IoT devices. AI and the IoT enable organizations to collect real-time data, make intelligent decisions, and automate processes to increase efficiency and performance.
- Improved decision-making and automation: AI-powered smart management processes enable companies to make data-driven decisions and automate routine tasks. Managers can access quick and accurate information by employing AI technologies, allowing them to make more informed and effective decisions. Employees can focus on higher-value activities, such as strategic planning, innovation, and customer interaction, by automating routine processes.

2.2.1 The benefits of AI in smart management include the following (Oleg, 2025):
- Improved decision-making skills: AI technologies give managers access to vast amounts of data, superior analytics, and predictive modeling skills. This allows for better-informed decisions, increased accuracy, and the ability to detect patterns and trends that humans might not notice on their own.
- Improved productivity and efficiency: AI-powered automation and process optimization can streamline daily processes, reduce manual effort, and enhance overall efficiency. Employees can then focus on higher-value activities, leading to improved productivity and better resource utilization. - Better Consumer Experience: AI-powered systems can analyze consumer data, preferences, and behavioral patterns to personalize interactions and provide personalized recommendations. This improves customer experience, satisfaction, and retention rates.
- Risk Mitigation and Fraud Detection: In real-time, AI systems can detect anomalies, identify potential risks, and report fraudulent activities. This enables proactive risk management, improved compliance, and stronger security measures.

2.2.2 Limitations of AI in Smart management

It can be represented by the following (Oleg, 2025):
- Poor Creativity and Judgment: AI systems are designed to analyze data and draw conclusions based on pre-defined rules or patterns. However, these systems may lack human intuition and creative problem-solving talents, limiting their effectiveness in complex or ambiguous situations.
- Data Dependence and Quality: AI systems rely on massive amounts of high-quality data for training and accurate predictions. Insufficient or biased data can lead to incorrect results and biased decisions. Ethical and Privacy Issues: AI technologies raise ethical issues, including privacy, transparency, and bias. AI systems must be designed and used ethically, with safeguards in place to protect user privacy and prevent discriminatory practices.

2.2.3 The Concept of Smart Management

Smart management is defined as the ability to leverage modern technology tools in managing human and material resources to achieve company goals at the lowest possible cost and highest returns for shareholders. Smart management is in constant communication with all levels of management within the company, while enhancing employee morale and citizenship, based on achievable and measurable goals.(Alqarni , 2025)

Smart management can also be defined as an approach that relies on digital technology, big data, and analytics to improve the efficiency of administrative processes and effectively direct resources toward shared goals, with a focus on flexibility, innovation, and the ability to adapt to changes.(Alkhalidi , 2023)

2.2.4 Characteristics of smart management

can be summarized as follows: (Redeida , 2016)

1. Data reliance: Data is computerized and categorized in a way that facilitates analysis of both qualitative and quantitative data.
2. Analytical reliance: Improves decision-making, increases productivity, and reduces losses.
3. Idea reliance: Adopts technological and creative ideas through the effective use of technology tools available within the company. These ideas help provide technical and logistical support to achieve goals.
4. Enhances competitive advantage: This is achieved by ensuring continuity and remaining competitive in the market by leveraging competitor information and motivating company employees.
5. Teamwork: A team of professionals from multiple disciplines makes decisions based on multiple ideas and disciplines, helping to increase the company's profits and achieve the appropriate price for target customers.
6- The Smart Manager: Through transparency in dealing with all administrative levels, the ability to solve problems, embrace creative ideas, and enhance communication with all parties within the company, both internal and external.

From the above, it can be concluded that smart management is based on the concept of teamwork, including planning, organizing, hiring, and monitoring. This allows communication with relevant stakeholders to make decisions that help increase profitability, reduce risk, and achieve a competitive advantage for the company, employees, and customers.

3. Study Methodology

The study relied on the descriptive-analytical approach, as this is considered a field study that is appropriate for adopting the descriptive-analytical approach. The aim was to identify the impact of artificial intelligence on improving smart management at the Ministry of Economy and Entrepreneurship in Jordan. Data was studied and analyzed by converting qualitative variables into measurable quantitative variables, with the aim of using them to test hypotheses and present the study's results and recommendations.

3.1 Data Collection Sources

To achieve the study's objectives, the researcher used two primary sources for data collection:

1. Secondary Sources: The researcher consulted library sources and reviewed previous literature to identify the sound scientific foundations and methods for writing studies, clarify the concepts

related to the study, and explain its variables, causes, and effects. This was also used to formulate hypotheses for the study and enrich the research process.

2. Primary Sources: The study is classified as a field study for collecting primary data. To achieve this, primary data was collected using a questionnaire as the primary tool for the study. Its paragraphs were prepared based on the relevant theoretical framework and previous studies. The questionnaire included several paragraphs that reflect the study's objectives and questions, to be answered by the respondents. Study Tool

The researcher designed the questionnaire for the current study to identify the impact of artificial intelligence on improving smart management at the Ministry of Economy and Entrepreneurship in Jordan. This tool was designed to cover the study's hypotheses and use evaluative phrases to determine the study sample's responses. This was done after extensively reviewing studies that addressed the measurement of study variables. The questionnaire consisted of two sections, as follows:

Section One: This section was devoted to collecting personal data on the study sample members, including job title, years of experience, professional certificates, and academic qualifications.

Section Two: It contains specific paragraphs covering the variables and hypotheses of the study. The number of paragraphs is 15 paragraphs., divided as follows:

- Continuous computer development variable: (5) paragraphs were devoted to it.
- Artificial intelligence technologies variable: (5) paragraphs were devoted to it.
- Computer Networks: (5) paragraphs were devoted to it.

The researcher also used a five-point Likert scale (1-5) to determine the degree of agreement of the study sample members with each item in the study tool. This scale helps convert responses into quantitative data that can be measured statistically, as shown in Table (1).

Table (1)
The five-point Likert scale used in the study tool

Level	More agree	Agree	Neutral	Not agree	More not agree
Level of approval	5	4	3	2	1

To determine the degree of importance of each item in the study when commenting on the arithmetic means of the variables included in the study model, a statistical criterion was used, which divides the arithmetic means into three levels (high, medium, low), according to the following equation:

Category length = (Upper limit of alternative - Lower limit of alternative) / Number of levels

Category length = (5 - 1) / 3 = 4 / 3 = 1.33. Thus, the levels are as follows:

Low degree of agreement: Represents arithmetic means from (1 - 2.33).

Medium degree of agreement: Represents arithmetic means from (2.34 - 3.66).

High degree of agreement: Represents arithmetic means from (3.67 - 5).

3.2 Study Population and Sample

The study population consisted of all individuals working in departments related to the study variables: Strategic Management, Entrepreneurship Management, Digital Transformation Management, the Institutional Development Unit, and Computer Networks Management at the Ministry of Digital Economy and Entrepreneurship in Jordan. Thus, the study sample consisted of (68) respondents, of whom (59) questionnaires were returned, representing (87%) of the total number of questionnaires distributed to the study sample. This percentage is considered good, and all questionnaires are valid for statistical analysis.

3.3 Decision Rule for Hypothesis Testing

Decision Rule for Hypothesis Testing: When testing the main hypothesis and sub-hypotheses, the decision rule stipulates that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted if the (T) values are statistically significant at a significance level of ($\alpha \geq 0.05$). The decision rule also stipulates that the independent variable has an effect within the multiple regression equation if the (T) values are statistically significant at a significance level of ($\alpha \geq 0.05$). Tests of the Study Tool

3.4 Validity of the Study Tool:

The study tool was presented to experienced and specialized accounting faculty members at Jordanian universities. The aim was to determine the clarity and simplicity of the phrases used in the study tool, as well as its consistency with the study objectives. This was also to confirm that the researcher had measured what was intended, and to achieve a high level of internal validity in the study. After the questionnaires were returned, the researcher made the modifications suggested by the referees before distributing them to the study sample.

3.5 Stability of the Study Tool

The researcher conducted a stability test for the study tool using the Cronbach's alpha internal consistency scale for the responses of the study sample obtained to determine the degree of reliability of the study tool. The statistically acceptable value for this scale is (60%) or greater. The following are the results of this test:

Table (2)
Cronbach's alpha internal consistency coefficient for the study areas and for the tool as a whole

Scope	Variable	Number of paragraph	Alpha
Artificial intelligence	Continuous computer development variable	5	86%
	Artificial intelligence technologies	5	77%
	Computer Networks	5	74%
	Total	15	79%

Table (2) indicates that the Cronbach's alpha coefficient values for the study variables and domains ranged between 0.74 and 0.86. This is considered acceptable according to statistical standards and provides good internal consistency for application purposes. The alpha value for the entire instrument was 0.79, indicating that all values were greater than the standard reliability measure of 0.60. This demonstrates the reliability of the data and its reliance on it for conducting the study's statistical analysis.

3.6 Tests of the Study Model's Suitability for Analysis

To test the suitability of the study data for linear regression analysis between two or more variables and parametric tests, the following tests were conducted:

3.6.1 Testing the Normality of the Data

Most parametric tests require that the data follow a normal distribution. To verify this, the One-Sample Kolmogorov-Smirnov Test was conducted to determine whether the data follow a normal distribution. The decision rule indicates that data follow a normal distribution when the Z value reaches a significance level greater than 0.05. The results of this test are shown below.

Table No. (3)
Normal distribution test for the study areas and for the tool as a whole

Scope	Variable	Significant
Artificial intelligence	Continuous computer development variable	9%
	Artificial intelligence applications	22%
	Computer Networks	18%
	Total	18%

The data in Table (3) show that the significance value for the study areas has a significance level greater than the statistical significance level ($\alpha \geq 0.05$), indicating that the data follow a normal distribution.

3.7 Characteristics of the Study Sample

The study sample consisted of (59) respondents working in departments and divisions related to the Ministry of Digital Economy and Entrepreneurship. To describe the characteristics of the study sample, frequencies and percentages were calculated for the personal variables of the study sample members. Table (4) shows the distribution of sample members according to personal variables

Variable	Title	Frequencies	Percentage
Function	Strategy Management	18	%30
	Entrepreneurship	16	%28
	Digital Transformation Management	14	%24
	Institutional Development Unit	5	8%
	Computer Network Management	6	%10
Qualification	Diploma	8	%13
	Bachelor's	35	%59
	Master	12	%21
	Doctorate	4	%7
Years of experience	Less than 5 years	12	%21
	5-10 years	17	%28
	11-15 years	12	%21
	More than 15 years	18	%30
	Total	59	100%

Source: Prepared by the researcher based on the outputs of the statistical analysis (SPSS).

The following is noted from the table:

1. It is noted that the job variable for the study sample has five jobs in the Ministry of Digital Economy and Entrepreneurship related to the study variables, namely artificial intelligence and smart management. The strategy management position has the largest percentage of the study

sample, at 30%, while the remaining percentages are close to each other in terms of entrepreneurship and digital transformation management. The researcher believes that the study sample's jobs target specific categories mentioned in the table above, as all jobs have a positive impact on the credibility and reliability of the study's results and recommendations, as the respondents have jobs closely related to the study variables.

2. It is noted from the educational qualification variable that the vast majority of the study sample hold a bachelor's degree, representing 59%. It is also noted that postgraduate studies (master's and doctorate) represent 28% of the study sample. The researcher believes that the study sample has good academic qualifications, which positively reflects on the validity and consistency of the study sample's answers, both in terms of clarity and clarity of responses. This positively impacts the achievement of the study's objectives and the credibility of the study's results.

3. From the variable of years of experience, it is noted that the largest percentage of those in the study sample had more than 15 years of experience, at 30%. Conversely, the percentages of the remaining experience categories were equal, with 79% of those with more than five years of experience. The researcher believes that dealing with AI and smart management variables requires years of experience to understand the changes in AI and its risks, how to identify them over time, and how to develop the necessary plans to address these risks should they occur, especially given the presence of AI variables that rely on information technology systems to achieve the greatest degree of responsiveness to smart management.

From the above, the researcher believes that the qualitative characteristics of the study sample have a set of characteristics that may provide several insights from various perspectives in dealing with AI and smart management variables. This may form a working team from multiple disciplines that helps integrate opinions and arrive at the best smart methods for dealing with smart management. 4-2 Results of the Descriptive Analysis of the Study Items

3.8 Artificial Intelligence Variables

1. Computer Networks
2. Continuous Computer Development
3. Artificial Intelligence Applications

Table (5) shows the arithmetic means and standard deviations for artificial intelligence, arranged in descending order of importance, according to the arithmetic means.

Table (5)
Arithmetic Means and Standard Deviations for Artificial Intelligence Variables

Rank	No paragraph	Variable	Average	Standard deviation	Evaluation score
1	1	Computer Networks	4.20	0.57	High
2	2	Continuous Computer Development	3.64	0.59	Medium
3	3	. Artificial Intelligence Applications	3.26	0.81	Medium
			3.60	0.65	

The table indicates that the opinions of the study sample members working in the relevant departments of the Ministry of Digital Economy and Entrepreneurship regarding the impact of

artificial intelligence ranged between (3.26-4.20), where computer networks came in first place with the highest arithmetic mean of (4.20) and a high evaluation level and a low standard deviation of (0.57), computer development came in second place with an arithmetic mean of (3.64) and an average evaluation level and a standard deviation of (0.59), while networks came in the latest artificial intelligence applications with an arithmetic mean of (3.26) and an average evaluation level and a standard deviation of (0.81). The overall results indicate that the average AI score in the Ministry of Digital Economy and Entrepreneurship was average, reaching 3.6, with an average evaluation level. This can be explained by the study sample members' awareness that AI variables have an impact on the Ministry of Digital Economy and Entrepreneurship in general. Therefore, this impact must be leveraged to anticipate risks in a way that facilitates their rapid diagnosis, management, and planning. The standard deviation for the field as a whole was low (0.65), indicating a convergence of opinions and a lack of dispersion in the study sample's responses to the AI variables for each variable individually. The results were as follows:

1**. Computer Networks**

Table (6) shows the arithmetic means and standard deviations for the computer networks variable items from the perspective of employees at the Ministry of Digital Economy in Jordan, arranged in descending order of importance, based on the arithmetic means.

Table No. (6)
Arithmetic means and standard deviations for computer network items

No	Paragraph	Average	Standard deviation	Rank	Evaluation score
1	Computer networks help enhance the Ministry's smart competitive advantage.	4.15	0.504	1	High
2	Computer networks help facilitate interactive data exchange across the Ministry's departments in a smart manner.	4.017	0.65	3	High
3	Computer networks help provide remote technical support, facilitating the intelligent delivery of data and information.	3.44	1.03	5	Medium
4	Computer networks help provide scalability and security to maintain the integrity of data across the Ministry in a unique and distinctive manner.	3.77	0.935	4	Medium
5	Computer networks help foster innovation and information leadership among employees in a smart manner.	4.08	0.761	2	High
Total		3.89	0.771		High

It is noted from the table above that the first paragraph has the highest average of 4.15 and a high evaluation score. This paragraph represents the help of computer networks to improve the smart competitive advantage of the ministry. This means that artificial intelligence methods represented by networks are based on storing all the problems that were previously dealt with and how to solve those problems and deal with them smart management by presenting the

experiences of the ministry itself and evaluating risks and recommendations for dealing with them in the event of their occurrence with the help of modern information technology tools. It is also noted that the fifth paragraph has the second highest impact score with an average of 4.08, which is a high evaluation score. This paragraph represents "Computer networks help enhance innovation and information leadership among employees in an intelligent manner." This means that computer networks have a positive role in classifying employees' intelligence through the creation of customer files and determining the degree to which their entrepreneurial ideas can be exploited to provide better services to citizens or customers. It is also noted that the second paragraph has an average of 4.017. This paragraph "Computer networks help facilitate the exchange of interactive data in the ministry's departments in an intelligent manner," which helps improve the quality and efficiency of managing the exchange of ideas and data in a distinctive interactive manner that helps enhance leadership and ideas in the ministry. This means that the continuous development and improvement of employee competencies, along with the presence of modern technology, helps networks improve the quality of customer databases. It is also noted that, in general, the standard deviation of most paragraphs of the computer networks variable is low, which indicates the absence of significant dispersion in the deviation of the average answers of the study sample in general. It is also noted that the overall average of the variable is 3.89, which is a high evaluation score. This indicates that the computer networks variable plays a role in enhancing and developing the methods and characteristics of smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan, in terms of providing recommendations and proposals for this purpose and improving the quality of reports related to smart management.

2- **Continuous Computer Development**

Table No. (7)

Arithmetic means and standard deviations for the continuous computer development variable

No	Paragraph	Average	Standard deviation	Rank	Evaluation score
1	Artificial intelligence helps improve the ministry's financial resources for smart management.	3.47	0.768	1	Medium
	AI helps develop customized programs tailored to customer needs to maximize benefits and service for citizens.	3.14	0.754	4	Medium
	AI helps provide effective communication networks among employees, helping generate creative ideas within the ministry.	3.06	0.850	5	Medium
	AI helps create new and innovative programming languages that facilitate the exchange of information with citizens in a distinctive and modern manner.	3.20	0.683	2	Medium
	AI helps create innovative training and educational tools to mitigate technology risks, such as account hacking and	3.14	0.754	3	Medium

	information security.				
	Total	3.20	0.761		Medium

It is noted from the previous table that most of the study sample's answers tended towards the agree and neutral paragraphs in the neural networks variable as one of the important variables of artificial intelligence, as the averages for the paragraphs of this variable ranged from (3.06-3.47), with the first paragraph representing the highest average of 3.47 and an average evaluation score. This paragraph represents that artificial intelligence helps improve the material resources for smart management in the ministry. This means that the Ministry of Digital Economy in Jordan is working to develop the necessary resources and spare parts for smart management and provide the necessary budgets to activate smart management to achieve the ministry's goals. It is also noted that the fourth paragraph represents the second best degree of influence according to the opinion of the study sample members with an average of 3.20, which represents that artificial intelligence helps create new and innovative programming languages that help exchange information with citizens in a distinctive and modern way. This means that the Ministry of Digital Economy uses advanced and unique programs to solve citizens' problems by creating innovative communication tools to exchange data that is relied upon to make the necessary decisions. It is also noted that the fifth paragraph has a positive impact, with an average score of 3.141. This is represented by the fact that artificial intelligence helps create innovative training and educational tools to mitigate technological risks, such as account hacking and information security. This may be achieved through the quality of information provided about customers, the continuous updating of customer data through social media, and the continuous collection of information about citizens. It is also noted that the standard deviation for most items of the continuous computer development variable is low, indicating a lack of significant dispersion in the deviation of the average responses of the study sample in general. It is also noted that the average of the variable overall is 3.89, which is an average evaluation score. This indicates that continuous computer development has a positive impact on smart management in terms of developing human and material resources, creating programming languages specifically for citizens, and creating strong and intelligent communication channels for dealing with citizens.

3- **Artificial Intelligence applications**

Table No. (8)

Arithmetic means and standard deviations for the artificial intelligence technologies variable

No	Paragraph	Average	Standard deviation	Rank	Evaluation score
1	Machine learning helps enhance the availability of modern technology tools that help define smart management within the ministry.	3.17	1.33	5	Medium
2	Big data helps enhance smart management within the ministry.	3.45	0.790	1	Medium
3	The ministry has an integrated infrastructure that helps develop smart management within the ministry.	3.24	0.785	4	Medium
4	The ministry's smart organizational structure helps distribute duties and tasks in a distinctive manner, helping	3.33	0.64	2	Medium

	generate pioneering ideas among employees.				
5	The ministry has special budgets from the state to adopt smart management principles.	3.32	0.687	3	Medium
	Total	3.30	0.846		Medium

It is noted from the previous table that the second paragraph represents the highest impact score with an average of 3.45, which is that machine learning helps enhance the presence of modern technology tools that help define smart management in the ministry. This means that the ministry uses modern applications in e-learning to provide distinguished services to citizens and help provide high-quality services. It is also noted that the fourth paragraph represents the second impact score with an average of 3.33, which is that the smart organizational structure of the ministry helps distribute duties and tasks in a distinctive way that helps generate pioneering ideas among employees, as the process of designing a smart organizational structure requires high capabilities and skills and a complete understanding of all the ministry's operations and how to link information between the various operational and technical departments in the ministry. It is also noted that the fifth paragraph has an average of 3.32, which is that the ministry has special budgets from the state to adopt smart management rules. This means that the state's general budget allocates special funds to promote pioneering ideas that help provide the best services in the easiest ways to citizens. It is also noted that the overall average variable score is 3.33, which is a medium evaluation score. This indicates that artificial intelligence technologies have a positive impact on dealing with smart management elements, such as machine learning, the presence of a smart organizational structure that defines the sequence of jobs and the relationship of each department to the next, and the availability of budgets and financial support for this purpose.

3.9 Hypothesis Testing

A single-sample t-test was applied to accept or reject the study hypotheses. The decision rule is that if the calculated t-value is greater than the tabulated t-value, the alternative hypothesis is accepted and the null hypothesis is rejected.

Hypothesis 1: "There is no statistically significant effect of computer networks on improving smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan."

Table 9: Statistical Data for the First Hypothesis

Calculated T	Schedule T	Variable	Null hypothesis result
18.60	1.96	Networks	Rejected

Based on the decision rule mentioned above, since the calculated t-value of 18.6 is greater than the tabulated t-value of 1.96, the decision is to reject the null hypothesis and accept the alternative hypothesis, which states that there is a statistically significant effect of computer networks on improving smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan.

Hypothesis2, "There is no statistically significant effect of continuous computer development on improving smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan."

Table 10
Statistical data for the second hypothesis

Calculated T	Schedule T	Variable	Null hypothesis

			result
3.73	1.96	continuous computer development	Rejected

Based on the decision rule mentioned above, since the calculated t-value of 3.73 is greater than the tabulated t-value of 1.96, the decision is to reject the null hypothesis and accept the alternative hypothesis, which states that there is no statistically significant effect of continuous computer development on improving smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan.

hypothesis 3, "There is no statistically significant effect of artificial intelligence technologies on improving smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan."

Table 11
Statistical data for the third hypothesis

Calculated T	Schedule T	Variable	Null hypothesis result
5.17	1.96	AI Techniques	Rejected

Based on the previously mentioned decision rule, since the calculated t-value of 5.17 is greater than the tabulated t-value of 1.96, the decision is to reject the null hypothesis and accept the alternative hypothesis, which states that there is a statistically significant effect of artificial intelligence technologies on improving smart management at the Ministry of Digital Economy and Entrepreneurship in Jordan.

4. Study Results and Recommendations

4.1 First: Study Results

The study reached the following results:

1. All primary and secondary variables of the study variables related to artificial intelligence and smart management follow a normal distribution. The degree of internal consistency of the questionnaire items is very good, indicating the validity and reliability of the study tool.
2. Computer networks at the Ministry of Digital Economy in Jordan help improve smart management, represented by achieving a competitive advantage, as competitive advantage is considered a characteristic of smart management.
3. Computer networks have a positive impact on enhancing and developing smart management by fostering the entrepreneurial ideas of employees, which is positively reflected in the provision of high-quality services to citizens.
4. Artificial intelligence helps the Ministry of Digital Economy and Entrepreneurship in Jordan is exchanging data in a unique and distinctive way that helps achieve the goals of fulfilling citizens' desires for electronic services in less time and with appropriate effort.
5- The artificial intelligence used in the Ministry of Digital Economy in Jordan helps develop material resources in a distinctive manner, which helps create specific skills and capabilities among employees that help develop smart management ideas and applications in the Ministry's departments and divisions.
6- Artificial intelligence in the Ministry of Digital Economy helps create new and innovative programming languages that help exchange information with citizens in a distinctive and modern manner. This helps develop the exchange of ideas between administrative levels in an innovative manner, which is a positive indicator of the development of smart management in the Ministry.

7- The organizational structure and the availability of financial allocations for the implementation of artificial intelligence technologies have a positive impact on the development of smart management in the Ministry of Digital Economy and Entrepreneurship.

4.2 Second: Recommendations

Based on the study results, the following recommendations can be made:

1. Establish a dedicated department within the Ministry whose job is to collect and update data related to current and future customers, using both fixed and dynamic databases.
2. Establish a multidisciplinary team with the primary role in exchanging pioneering ideas. This team should include financial, legal, accounting, and behavioral specialists, to obtain a comprehensive picture of how to provide distinguished services to citizens.
3. Establish regulations and legislation within the Ministry of Digital Economy that document all previous experiences, whether of employees or citizens themselves, within expert systems data. This facilitates innovative decision-making, free from bias or personal opinions.
4. Reduce the use of free computer network data and avoid relying primarily on it to obtain, update, or expand customer data. Instead, rely on reliable computer network data, even if it entails paying additional sums or incurring additional expenses. 5- Enhancing employee capabilities in dealing with smart management and artificial intelligence, preparing annual or periodic reports, reviewing these reports with the Ministry, and making the necessary recommendations to develop mechanisms to mitigate the risks of artificial intelligence tools.
6- Applying the study to other sectors, such as the services sector, the industrial sector, or other sectors, to obtain a complete and comprehensive picture of the impact of artificial intelligence on risks in general, or on good governance in particular.

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