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| Research Article

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The Role of Artificial Intelligence in Reducing Information Technology Costs

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Abstract: The purpose of this article is to check the effect of artificial intelligence (AI) and the increasing technological progress on accounting systems and the effect of how they change. This article presents the latest state of AI through a theoretical approach to accounting information technology and financial reporting applications, including information from all aspects of accounting and information technology. This phenomenon is still evolving, and many companies have not been able to use these strategies and methods properly. Since most of them reflect new ideas and expand the limits of accounting and information technology, this article discusses the information available on the subject.

We determined that the incorporation of AI-driven automation into the IT and financial services sectors signifies a transformative shift that offers substantial financial advantages, enhanced operational efficiency, and improved consumer experiences. We have identified AI's many applications, financial implications, difficulties, and opportunities in IT and financial services, which demonstrate the potential to reshape the industrial landscape and foster sustainable growth in a rapidly evolving digital economy.

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Introduction

The incorporation of artificial intelligence (AI) across several industries has emerged as a defining characteristic of the 21st century, fundamentally transforming business operations and services. AI-driven automation is transforming information technology in rapidly evolving sectors, as financial institutions swiftly adopt AI technologies to enhance operational efficiency, minimize expenses, and elevate customer experiences, encompassing banks, insurance firms, and investment companies.

Artificial intelligence denotes the utilization of methodologies such as machine learning, natural language processing, and robotic process automation to execute tasks traditionally carried out by humans within the framework of artificial intelligence. The activities encompass both basic administrative responsibilities and intricate decision-making procedures. Information technology and financial services, characterized by a significant reliance on data and precision, are especially amenable to such automation.

Utilizing AI in IT and financial services offers numerous financial advantages. This enables organizations to process substantial volumes of data swiftly and precisely, resulting in considerable enhancements in efficiency and production. The automatic technology significantly reduces costs, representing a fraction of the expense associated with human work.

Moreover, AI enhances the precision of financial procedures, diminishes human errors, and bolsters reliability. Nonetheless, despite these advantageous results, AI manual automation also presents numerous cost obstacles. A primary concern is job displacement. As the AI system advances in sophistication, it can first do tasks traditionally executed by people, leading to a reduction in the workforce in certain sectors. This heightens the likelihood of rising unemployment.

Research problem

Despite much to use artificial intelligence (AI) technologies in the IT environment - such as machine learning, natural language processing and robot process automation - many organizations do not realize an expected cost savings. This system is due to challenges in integration, data quality, security and privacy risk and change of skills. These problems make a difference between "promise" and "real feeling" of cost reduction.

Consequently, the research problem can be done as follows: AI application through its technical and organizational dimensions, to what extent, helps to reduce IT costs actually? What conditions or mechanisms does this effect increase or prevent it?

Research objectives

This letter aims to deliver a thorough examination of the influence of AI-driven IT solutions in the fields of information technology and financial services. It will identify both beneficial and detrimental outcomes, drawing on the analysis of major financial organizations that have adopted AI technologies.

This paper will analyze genuine examples to elucidate best practices and experiences, offering useful insights to decision-makers and industry leaders.

Research Significance

The study of AI's role in reducing the cost is an important topic in today's world, where technology has increased significantly in all areas of life. The importance of this research lies in

AI's ability to increase efficiency by automating many processes, which reduces the time and effort spent on repeated tasks. This costs cost reduction, better decision -making, minimum human error, increased operational efficiency, demand -driven adaptation, low maintenance costs, rapid innovation, adapted use of resources, market adaptation and time savings.

Checking these several dimensions of AI's role in cost reduction helps to understand how it can be taken effectively to maximize potential benefits, which can support business stability and competition.

Research Hypothesis

H1. Use machine learning technologies has a significant positive effect on reducing operations and support costs in IT departments.

H2. Applications for natural language treatment (eg chatbots and virtual assistants) have a significantly positive impact on reducing user service and technical support costs.

H3. Robot process automation has a significant positive effect on reducing regular commercial costs (data introduction, harmony, reporting).

H4. The cost savings in the form of maturity of integration between AI solutions and existing systems are improved (ie a reinforcement effect).

H5. Data quality and management affect the level of cost savings achieved through AI.

H6. Cyber security and privacy maturity reduce unexpected costs (which occur from events/fractures) and increase pure total saving.

H7. The actual level of automation conveys the relationship between AI Adotio

H8. Skills readiness and cultural transformation moderate the effect of AI on costs; the higher the skill levels and organizational acceptance, the greater the cost-reducing impact.

Study dimensions and variables

Depending Variable:

Reduction of information technology

Operating meter dimensions (cost reduction conditions / per user / per transaction / monthly cost):

Infrastructure and operating costs: Reduction in resource consumption, server driving time, licensing and maintenance expenses.

Support and service cost: per ticket cost, resolution time, amount of tickets checked automatically.

Error and compliance cost: A error rate in reporting/processing, compliance penalties, time for the preparation of the report.

Cost of shutdown and maintenance: Operating shutdowns, number of system errors, savings from forecast maintenance.

Technical labor Cost: Relates work hours from regular tasks to valued activities.

Independent variable (AI -adoption) and their dimensions

Machine Learning: Predictive and Classification Model, Discrepancy Detection

(Real use, model accuracy, number of cases of use in production).

Natural Language Processing (NLP): Chatbots, Virtual Assistant, Sentment Analysis

(The proportion of questions is automatically handled, user satisfaction).

Process automation: Number of automated processes, reliability rate, requirements for exceptions to human intervention.

Intelligent analysis and decision support: predictive dashboard, action recommendation (Decision -making, reduction in waste/reunion).

Chapter one

Literature review

Automation in information technology and financial services is not a recent development. The industry has a lengthy history of utilizing technology to optimize processes and enhance service distribution. The advent of automatic teller machines (ATMs) in the 1960s revolutionized financial services by facilitating round-the-clock access to cash and fundamental banking functions. In the 1980s and 1990s, stock markets transitioned to computerized trading platforms, resulting in expedited and more efficient transactions.

The advent of online banking occurred in the early 2000s, enabling clients to shop and manage their accounts remotely. These initial automation methods established the groundwork for more sophisticated technologies. The advancement of complex algorithms for high-frequency trading in the early 21st century was a substantial leap, emphasizing the capacity for automation to enhance market efficiency and liquidity. Nonetheless, these

Information Technology (IT): It refers to data organized and processed to make sense and references that can increase the decision. As a general rule, by increasing the amount and quality of the information, users are able to make better decisions. Useful and meaningful information is characterized:

Provides price and relevance,

Limited access to authorized persons,

Present events and activities correctly and without errors,

To be available when needed, in a format that is lightweight and quickly usable,

Reduce the uncertainty and improve the decision,

To be used and convenient for decision makers,

Topicality in delivery,

Authenticity, valuable for its reliable source or material,

Completeness is not important (Aqeel Hamza, 2022, p. 189).

At the moment, artificial intelligence has three generations (Bo Zhang, June Chu and Hang SU, 2023, P. 18).

Artificial intelligence, the first generation of knowledge -based AI, depended on three main factors: knowledge, algorithms and computing power to create intelligent systems.

Artificial intelligence, the second generation of data -driven AI, depends on three different factors: data, algorithms and calculation capacity.

Thus, the first and second generations of AI simulate human intelligent behavior in just a limited aspect, and each generation has its limits. In order to create AI that can actually reflect human intelligent behavior, it is necessary to develop strong and explanatory AI principles. It aims to produce and promote safe, reliable and scalable AI technologies - this is the third generation of artificial intelligence. The central idea is to combine knowledge -based approaches (first generation) to create more powerful AIS using four elements of knowledge, data, algorithm and

calculation to create more powerful AIS at the same time. Currently, the concept also exists with double location models.

For AI in accounting, most universities provide courses related to accounting systems; However, they are affected by many internal and external factors. These include course materials, theoretical knowledge and differences between practical applications and difficulties in developing a scientific computer system that is able to meet developed requirements.

The accounting profession is now facing important threats, as new techniques are specially designed to reopen the region. Since the arrival of the computer, the profession has undergone greater adaptation. However, such changes can also cost accountants to cost their jobs. In fact, Boston Consulting Group has predicted that by 2025, up to 25% jobs will be replaced by software or robot, and accountants are likely to automate 10% jobs.

Currently, the use of AI in accounting is still in its early stages. Although more and more companies have introduced accounting robots, these robots are mainly a form of automated operating technology with clear algorithms, which are beneficial for large numbers to be suitable for repetitive operating scenarios, but a lack of deep learning skills - mainly weaker AI - is.Currently, automation techniques are used more widespread, but the scope is mainly concentrated at the level of financial reporting. It has not yet added major sectors for accounting as financial analysis, nor has it had a transformation effect on accounting standards.

When AI is fully integrated into accounting work, it should be able to change each stage of traditional accounting processes, including general account book entries, formation of accounting information, generation of financial reports and generations of appropriate decisions- Suggestions - General improvement in general financial results.

Therefore, the depth and breadth of AI applications in the accounting industry are limited. The complexity of AI technologies combined with a lack of practical experience has created many challenges for their development. As a result, the forward road to pursue AI in the accounting sector is still long.(Elaha Soraush and Ali Reza Monjami, 2021, P. 50)

First requirements: Overview of the role of artificial intelligence technology in information technology

Robot Process Automatization (RPA):

RPA encompasses the automation of rule-based tasks through the utilization of software robots. In the financial industry, RPA is utilized for processes including data registration, match reporting, and account reconciliation. By automating these routine processes, financial institutions can liberate human resources to concentrate on more intricate and valuable activities (Silva Augusto, 2023, P. 13).

Increase in productivity and efficiency:

Research consistently indicates that AI can markedly enhance production and efficiency. By automating routine tasks, AI personnel enhance productivity by focusing on high-value work. A research by the McKinsey Global Institute indicates that AI has the potential to enhance productivity growth by as much as 1.4% per annum across many sectors, including banking.

Cost reduction:

AI-driven automation diminishes operating expenses by decreasing the necessity for human labor and minimizing errors. An Accenture analysis estimates that AI could enable banks to save as much as $447 billion by 2023 through cost reductions and productivity enhancements.

AI-driven automation is making substantial progress in information technology and financial services, with many applications showcasing their capabilities.

Scam detection and prevention:

The AI technology can evaluate extensive transaction data in real time to identify fraudulent actions. By detecting anomalous patterns and flagging questionable transactions, these systems enhance the security of financial transactions.

Risk Management:

AI-driven models can assess credit risk with enhanced precision by evaluating extensive datasets compared to conventional approaches. This enables financial firms to render more informed loan decisions and diminish default rates.

Customer service:

Chatbots and virtual assistants are increasingly employed to conduct customer surveys, delivering prompt and precise responses. This enhances customer satisfaction while also decreasing the expenses associated with human customer support professionals (Gixin Luo, Chengzun Meng and Yan Kai, 2021, p. 78).

Trade and investment:

The AI algorithm is utilized in trading to assess market data and execute trades at ideal moments, hence enhancing trade efficiency and profitability. In investment management, artificial intelligence is employed to build personalized investment strategies tailored to individual risk profiles and financial objectives.

Economic effect of AI-based information technology

AI operated automation formed the scenario for IT and financial services, which generates deep financial impact:

Efficiency and productivity

Cost management

Customer experience.

A. Positive Impacts

Cost Reduction:

AI-driven automation allows financial organizations to achieve substantial cost reductions by reducing labor expenses and operational inefficiencies. Automation reduces the necessity for human participation in routine tasks, resulting in diminished employment requirements and lower overhead costs. AI algorithms can automate threat assessment methods in lending, hence diminishing the necessity for manual credit evaluations and decreasing mortgage origination costs. Furthermore, AI frameworks using Morcover can enhance help distribution and asset management strategies, therefore reducing operational expenses and augmenting financial performance.

Section two: Research background

Foreign studies

Bo Zhang et al. (2023):

Since the birth of artificial intelligence (AI) in 1956, two competing paradigms have shaped its development: symbolism and relationships (or sub -discipline). Until the late 1980s, symbolism dominated AI research, gained speed in the 1990s and gradually changed symbolism. This article recognizes symbolism as the second generation as the first generation of AI and Connectionism. However, the two paradigms simulate the human mind only from a perspective, which means that

AI really cannot get human -like behavior by relying on a model. In order to develop safe, reliable and scalable AI technologies, the author emphasizes the need to establish a strong and explanatory principle for AI. Consequently, this article is dedicated to the third generation AI by combining the strength of existing models.

Zhang et al. (2020):

This study investigated recent technological progress that has significantly changed the accounting profession. The article offers a comprehensive observation of today's development in Big Data, Machine Learning, AI and Blockchain, which is quickly used in general business activities and by accounting people worldwide. This discusses the development of accounting professions in light of these technological innovations and evaluates the possible effects of future development.

The study also examines the challenges and opportunities related to these new techniques for accounting doctors and teachers. This emphasizes the increasing demand for IT professionals with accounting expertise compared to traditional accountants, provided the rapid expansion of AI applications in the area. The article further explains how The article further explores how those technological adjustments and evolving employer necessities are reshaping the abilties and talents needed for accounting graduates, and it requires a dialogue on how higher education institutions and accounting applications can adapt to fulfill these emerging needs.

Yanling Shi (2020):

With the improvement of synthetic intelligence (AI) technologies, AI has entered the accounting subject greater deeply, gambling a crucial function in enhancing business performance, reducing operational mistakes, preventing and controlling regulatory risks, improving company competitiveness, and strengthening human resources. However, AI era is a double-edged sword: at the same time as it advances accounting practices, it additionally places accountants susceptible to unemployment within the evolving work environment. Based at the concept of AI technology and its packages in the accounting enterprise, this newsletter examines the impact of AI at the accounting profession and outlines the demanding situations posed by way of AI technology, even as additionally providing techniques for growing roles together with designers and supervisors of AI-based accounting structures.

Steve J. Sutton et al. (2016):

This have a look at tested the studies productivity of AI professional systems in accounting and concluded that each instructional studies and sensible use of AI expert structures had declined for the reason that late Nineteen Nineties. However, whilst these findings are reviewed from a broader perspective focusing on AI as opposed to specialized systems, the consequences show that no matter a few stagnation in the overdue 1990s AI research in accounting has regularly multiplied over the past 30 years.

The look at also shows that studies into AI technologies as embedded modules within integrated audit help systems stays strong in exercise. Based on these results, the authors call for further studies into the ability use and alertness of AI strategies in accounting. Contrary to earlier perceptions, the sector remains vibrant and holds first rate ability for Accounting Information Systems (AIS) researchers to play a main function in advancing this area.

Local study

Laila Hafze (2022):

The existence of transparent and comparable economic information is the cornerstone of accountability and information is reported to be an financial decision. The primary role of financial reporting is to effectively communicate information in a reliable and timely manner to

external users. Many studies worldwide have focused on the quality of financial reporting, mainly on the structured report and quantitative accounting data. Today, however, a large part of economic information is published through qualitative revelations such as narrative reports and text documents.

This change has detected the equipment that is able to extract useful knowledge by examining and analyzing financial sources from unnecessary and qualitative data. It has known a branch of AI as data mining, and within it the use of text data has born another sub -region called text mining. Lesson mining is a special type of data mining, which is aimed at removing valuable information from unarmed or semi-composed text documents by mainly identifying and presenting the pattern.

Research has shown that in order to measure and predict financial and accounting variables today, it is necessary to go beyond quantitative reports and keep more dependence on qualitative reports and text analysis. Only based on figures, researchers should also consider corporate information and insights from reports. This change has inspired researchers in accounting and finance to use AI techniques in various fields for accounting knowledge and auditing, especially to reveal corporate text information and the relationship between basic company elements. So The article therefore tries to present and explain the most effective and often used the AI techniques in financial accounting and auditing.

Tavihad Banahi (2022):

This article discusses the nature of the Accounting System (AIS) and their interaction and impact on organizations. This begins with a difference between data and useful information characteristics, and explains how to determine the value of information. Type decisions with support for relevant information then emphasize organizations. The study also checks the value that provides AIS organizations, and in the end it is broad on the use of AI in different fields, including the implementation of accounting systems.

Al-Jaafari (2021):

The modern study goals to check the basic infrastructures with a focus on the synthetic intelligence (AI) measurement of expert systems or the AI chain and to provide an explanation for those variations within the studies literature, in addition to the position that teachers must play inside the destiny of AI in accounting. A better understanding of the intent in the back of this recognition is that expert structures are, in reality, a subclass of AI programs. It appears that using the broader class of AI is of greater significance, particularly if expert structures have simply been phased out and replaced with other, doubtlessly extra advanced and sensible types of smart systems that force studies and practice forward. This article discusses the programs of AI and expert structures in auditing and accounting.

Mohammed Akbar (2017):

AI, further to its use in various fields, has also discovered its region in accounting and auditing, wherein it involves the advent of software and sensible tools able to acting many human-like behaviors which includes learning and hassle-solving. Accounting become one of the very first commercial enterprise fields to include facts and conversation technology (ICT) tools. Although ICT was to start with used in fundamental accounting structures, it quickly have become obvious that monetary modeling structures had been highly beneficial in the analytical components of accounting.

Researchers cited, but, that the tempo of ICT adoption in accounting as a career become exceedingly sluggish, because of the conservative technique of practitioners inside the subject. Typically, ICT equipment have been employed for a wide variety of less complicated tasks, which includes complex mathematical computations, statistical analysis, and graphical analysis. Nevertheless, with the continuous advancement of computer era, maximum important audit

inmost of the most important audit firms have assessed the use of AI in audit decisions as an integrated body as an integrated body as an integrated body in an integrated audit audit system.

Chapter two: Application of artificial intelligence in information technology

Paragraph one: Case studies

The deployment of AI-driven automation in information technology and financial services has resulted in a notable case study detailing its economic impacts and operational advantages across many industry sectors.

JP Morgan Chase: Coin (Contract Intellence)

JP Morgan Chase utilized the COIN (Contract Intelligence) platform to automate the evaluation of legal papers, a process that is often labor-intensive. Coin employed Natural Language Processing (NLP) and machine learning techniques to analyze and extract pertinent information from intricate legal documents, including loan agreements and associated contracts.

By automating document review functionalities, the coin decreases the time and resources needed by legal teams for manual contract verification, hence enhancing operational efficiency and lowering expenses. JP Morgan Chase believes that the coin conserves around 360,000 hours of legal professionals' time, demonstrating significant financial advantages of AI-driven automation (Tablet, 2019, p. 284).

Bank of America: Erica (AI-Investigated Virtual Assistant)

Bank of America launched Erica, an AI-driven virtual assistant aimed at enhancing customer service and engagement. Erica use a machine learning system to analyze consumer surveys and deliver personalized banking advice and assistance.

Customers may engage with Erica via voice commands or text messages to check account balances, pay bills, and receive budgeting advice. Bank of America aims to enhance the overall customer experience by leveraging AI technology to deliver timely and precise support, while concurrently reducing costs and alleviating the workload of human customer support representatives.

Since its release, Erica has managed hundreds of thousands of patron interactions, highlighting its effectiveness in driving each operational performance and purchaser pleasure.

Mohra: AI in investment management

A prominent investment management firm employs AI algorithms to enhance agricultural practices, investment strategies, and portfolio management processes. AI-MANGO models evaluate market data and economic indicators, whilst AI-operated agricultural investment machinery assists in recognizing investment prospects and adjusting asset allocation.

These AI solutions offer real-time insights and recommendations to portfolio managers, enabling them to make informed decisions and achieve superior investment results. By incorporating AI into its investment management strategy, the firm demonstrates how sophisticated analytics and machine learning approaches can enhance operational efficiency, mitigate risk, and deliver value to investors. Vetrivel, S. C.

HSBC: AI in risk management

HSBC has employed AI technologies to enhance its risk management system and bolster regulatory compliance. The AI-driven risk models evaluate extensive transaction data and market information to identify potential hazards and anomalies in real time.

These models enable HSBCS to enhance the precision of risk assessment, detect fraudulent activity, and assure adherence to stringent regulatory standards. HSBC leverages AI in risk

management to mitigate operational risk, enhance decision-making, and uphold robust management processes throughout its global operations.

Section Two: Challenges and Considerations

The integration of AI-pushed automation into records generation and economic offerings affords numerous demanding situations and issues that must be addressed to maximize benefits and mitigate capacity dangers.

A. Technical and Operational Challenges

B. Regulatory and compliance problems

Talent collection and storage:

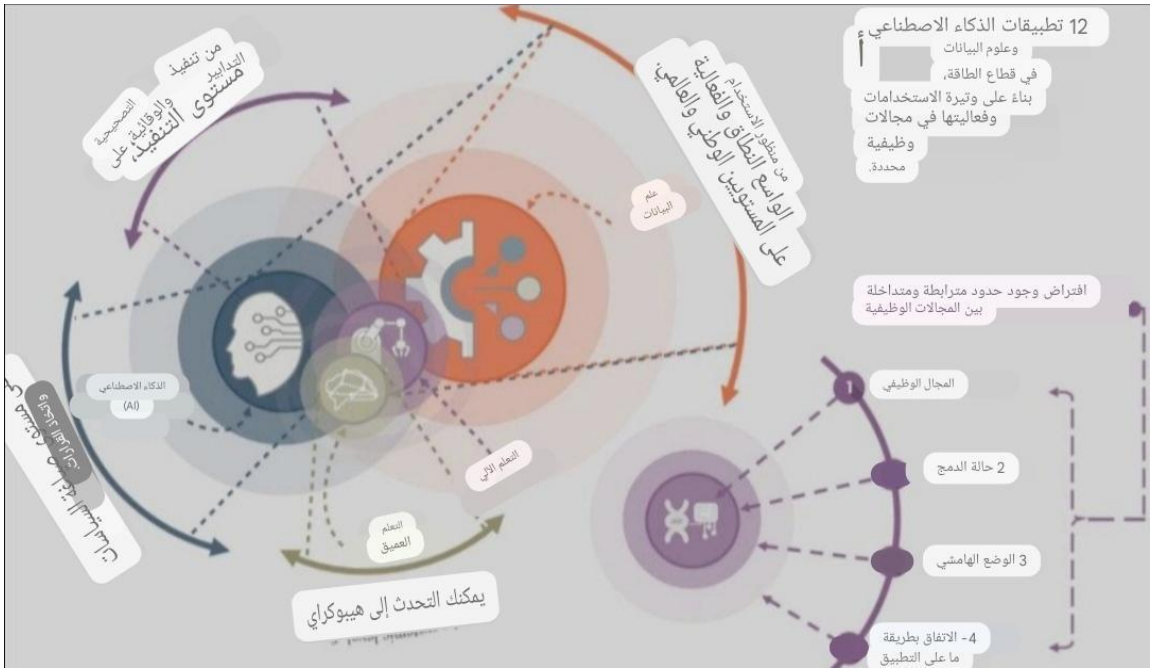
The demand for AI expertise, encompassing Data Scientists, Machine Learning Engineers, and AI specialists, has surged markedly across the IT and financial services sectors. Financial institutions have escalating difficulties in recruiting and retaining premier AI talent amid the evolution of global competitiveness and technological changes. Formulating competitive remuneration packages, fostering an innovative culture, and offering continual learning opportunities are essential strategies for attracting and retaining AI talent. These initiatives are crucial for facilitating digital transformation and fostering innovation in information technology and financial services.

Privacy Protection and Data Management:

The automation of AI operations enhances privacy protection and data governance, particularly with the collection, storage, and utilization of personal and financial information. Financial institutions must adhere to privacy regulations and industry standards, such as the General Data Protection Regulation (GDPR) and the Payment Card Industry Data Security Standard (PCI DSS), to safeguard data and uphold consumer privacy rights and trust.

Implementation of data Corresponding techniques, implement privacy effect and ensure transparency in computer use practices are important measures to promote moral data management and maintain the customer's trust in AI-operated IT and financial services.

As illustrated in Figure …



Policies that encourage innovation and entrepreneurship can stimulate process growth in these fields. Governments and industry leaders need to work collectively to create a positive environment for innovation, including offering investment for startups and strengthening studies and development tasks. To assist people tormented by AI-driven automation, social protection nets and sturdy economic regulations are critical. These include unemployment benefits, get admission to to healthcare, and retraining packages. Implementing rules that sell economic stability and mitigate the results of process displacement can facilitate the transition procedure for workers. Additionally, innovative monetary fashions, along with standard basic profits, can provide a safety internet for those most laid low with automation.

Methodology (Applied Framework)

1. Research Design

This have a look at adopted a descriptive–analytical design with a quantitative technique. It is predicated on a based questionnaire to measure the adoption of AI technologies, organizational elements, and their effects on decreasing IT costs. The accumulated information are then analyzed statistically to describe the phenomena and take a look at the proposed causal hypotheses mentioned within the theoretical framework.

The development of dimensions and items is grounded within the theoretical foundation of the studies subject matter, “The Role of Artificial Intelligence in Reducing Information Technology Costs,” and the accompanying structured questionnaire designed the use of a 5-point Likert scale.

2. Research Population and Sample

Research Population: Employees operating in IT and monetary services establishments who have direct interplay with IT-associated activities (along with infrastructure operations, technical aid, automation, and analytics) or who paintings in financial/regulatory units encouraged with the aid of those sports. This aligns with the theoretical scope of the observe, which examines the packages of AI in IT and financial services environments and their impact on cost discount.

3. Sample and Size

A purposive pattern was decided on, together with personnel and bosses who meet the situations of having revel in or familiarity with the adoption of AI tools within their institutions. The evaluation might be carried out on 70 legitimate questionnaires (n = 70) which can be statistically usable.

4. Unit of Analysis

The character (worker/manager) serves because the primary unit of analysis.

5. Inclusion Criteria

A minimal of three hundred and sixty five days of revel in in IT, support, or operations tasks, or in a monetary function at once associated with cost results.

Direct interplay with or publicity to as a minimum one AI utility (e.G., Machine Learning (ML), Natural Language Processing (NLP), Robotic Process Automation (RPA), or Intelligent Analytics) inside the ultimate 12 months.

6. Ethical Considerations

Participation within the have a look at become voluntary, with assurances of records confidentiality, and the consequences are to be used strictly for research purposes handiest.

3. Research instrument (questionnaire)

Structure and material:

The questionnaire is organized using a five-point similar scale (1 = strong disagree ... 5 = endurance) and includes the following sections:

Demographic data: years of gender, age, educational qualifications and experience.

Adoption of AI technologies: Elements that measure the use and operating effects of AI tools such as Machine Learning (ML), Natural Language Processing (NLP), Robotic Process Automation (RPA) and Intelligent Analytics. These elements consider dimensions as accuracy, cost reduction, fault/fraud detection and reduction of reaction time.

Organizational and assistant factors: Elements that address data quality and management, system integration, maturity of cyber security and preparedness and acceptance of labor.

Effects on cost reduction (dependent variables): elements that measure cost dimensions, including infrastructure and operating costs, support and service costs, errors and conformity costs, shutdowns and maintenance costs and low dependence on common functions.

4. Validity and Reliability Tests

Validity

Content Validity (Expert Judgment):

The questionnaire gadgets could be reviewed through an educational/professional panel of 3–5 professionals inside the fields of accounting facts systems, information technology, synthetic intelligence, and records. The assessment procedure targets to evaluate the relevance of items to their dimensions, clarity of language, comprehensiveness of coverage, absence of ambiguity, and consistency of the size. The experts' feedback could be documented, and the gadgets will be revised consequently (e.G., deletion, merging, rephrasing, or addition). This technique could be aligned with the theoretical framework outlined in the observe's conceptual basis.

Construct Validity:

Following facts collection, an Exploratory Factor Analysis (EFA) will be conducted to verify the grouping of items underneath the proposed dimensions. When required, a Confirmatory Factor Analysis (CFA) can be carried out to test the goodness-of-fit of the proposed structure, covering the dimensions of AI adoption, organizational elements, and their impact on fee discount. These analyses will be based on the conceptual framework defined inside the theoretical background.

3. Reliability

Internal stability (Alpha of Kronback):

Cronbach alpha will be calculated as a whole for each dimension and a whole for equipment. The values of α and 0.70 are considered an acceptable indicator of reliability, while α and 0.80 are considered good. In addition, Alpha will report being removed to improve measurement security if necessary. (It will be intended for trial data, n = 70).

Total reliability (CR) and average variance extracted (AVE):

These indicators will be used to strengthen the evidence of reliability and convergence. CR and 0.70 and AVE and 0.50 thresholds will be used for valid dimensions.

4. Data Suitability for Factor Analysis (testing of KMO and Bartlet)

Kaiser -Meer -Ookin (KMO) Measurement:

KMO is between the statistical 0 and 1 and assesses the sample that is sufficient for the factor analysis. Of 0.60 values are considered acceptable and 0.70 good, and. 0.80 excellent.

Bartlet's spherical test test:

This test must be statistically important ($p < 0.05$), indicating that correlation is suitable for matrix factor extraction.

The sought factor analysis (EFA) in the study of both KMO and Bartlet will be intended for trial data ($n = 70$) as a first step for and subsequent confirmation factor analysis (CFA) and regression tests.

5. Statistical Analysis Procedures (Summary)

Coding and Data Cleaning:

Likert scale objects (1–five) will be coded with standardized measurement guidelines to ensure consistency.

Descriptive Statistics:

Means, preferred deviations, and coefficients of variant will be calculated for each object and measurement. Additionally, demographic traits of the sample can be supplied in tabular form.

Factor Analysis Suitability (KMO

Descriptive Analysis

Table (3-1): Frequency Distribution and Percentages of the Research Sample by Gender

Gender	Frequency	Percentage
Male	46	%65.71
Female	24	%34.29

Interpretation:
The results show that the majority of the sample are **male respondents (65.71%)** compared to **female respondents (34.29%)**. This indicates that the study population is predominantly male, which is expected in IT and financial services environments where male representation is typically higher.

Descriptive Analysis

Table (3-2): Frequency Distribution and Percentages of the Research Sample by Age

Age Group	Frequency	Percentage
39–30	22	%31.43
49–40	19	%27.14
Less than 30	19	%27.14
and above 50	10	%14.29

Interpretation:

The most represented age group is **30–39 years (31.43%)**, followed by **40–49 years** and **less than 30 years**, each at **27.14%**. The **50 and above** group is the least represented at **14.29%**. This indicates that the sample is predominantly composed of **young and middle-aged professionals**.

Descriptive Analysis

Table (3-3): Frequency Distribution and Percentages of the Research Sample by Educational Qualification

Educational Qualification	Frequency	Percentage
Bachelor's Degree	33	%47.14
Master's Degree	22	%31.43
Doctorate (PhD)	9	%12.86
Other	6	%8.57

Interpretation:

The majority of the respondents hold a **Bachelor's degree (47.14%)**, followed by those with a **Master's degree (31.43%)**. Respondents with a **Doctorate (12.86%)** and **other qualifications (8.57%)** form a smaller proportion. This reflects a **diverse educational background**, with university-level qualifications being the most dominant.

Table (3-4) translated into **English** with academic interpretation:

Descriptive Analysis

Table (3-4): Frequency Distribution and Percentages of the Research Sample by Years of Experience

Years of Experience	Frequency	Percentage
years 10–5	28	%40.00
More than 10 years	27	%38.57
Less than 5 years	15	%21.43

Interpretation:

The majority of respondents have **5–10 years of experience (40%)**, followed by those with **more than 10 years (38.57%)**. The group with **less than 5 years of experience** represents **21.43%** of the sample. This indicates that the sample is largely composed of professionals with **moderate to extensive work experience**.

Table (3-5): Means and Standard Deviations of the Questionnaire Dimensions

Dimension	Mean	Standard Deviation
AI Adoption	4.00	0.80
Organizational Factors	3.59	1.17
Cost Reduction	3.83	0.85

Interpretation

- The **AI Adoption** dimension scored a mean of **4.00**, reflecting a high level of acceptance and application.
- The **Organizational Factors** dimension recorded a mean of **3.59** with a relatively high standard deviation (**1.17**), indicating variability in respondents' views regarding institutional readiness.
- The **Cost Reduction** dimension achieved a mean of **3.83**, suggesting that AI contributes positively to reducing costs, with a reasonable level of consistency among responses.

Validity and Reliability Tools

Table (3-6): Cronbach's Alpha Reliability Coefficients for Dimensions and the Instrument as a Whole

Dimension	Cronbach's Alpha
AI Adoption	0.759
Organizational Factors	0.791
Cost Reduction	0.803
Overall Instrument	0.754

Interpretation:

All Cronbach's Alpha values for the main dimensions are above **0.75**, indicating very high reliability and strong internal consistency among the items. The overall instrument value (**0.754**) falls within the acceptable threshold (> **0.70**), which further supports the credibility of the instrument for measuring the studied concepts.

Factor Analysis Suitability

Table (3-7): Results of KMO and Bartlett's Test for Data Suitability

Measure	Value	Significance (p)
KMO	0.801	–
Bartlett's Test	807.36	0.000

Interpretation

- The **KMO value = 0.801** indicates an **excellent** level of sample adequacy for conducting factor analysis.
- Bartlett's Test is statistically significant (**p < 0.05**), confirming that the correlation matrix is appropriate for factor extraction.

Correlation Analysis

Table (3-8): Pearson Correlation Matrix Between the Study Dimensions

Dimension	AI Adoption	Organizational Factors	Cost Reduction
AI Adoption	1.000	0.678	0.754
Organizational Factors	0.678	1.000	0.720
Cost Reduction	0.754	0.720	1.000

Interpretation

- There is a **strong positive correlation** between **AI adoption and cost reduction** (r = 0.754), indicating that greater application of AI technologies leads to stronger effects in reducing operational and technical costs.
- The relationship between **organizational factors and cost reduction** is also **strong and positive** (r = 0.720), reflecting that data quality, system integration, and institutional readiness are critical in maximizing the cost-reducing effect of AI.
- A **moderate-to-strong positive correlation** exists between **AI adoption and organizational factors** (r = 0.678), suggesting that institutions with robust infrastructure and governance are better positioned to adopt AI technologies effectively.

Hypothesis Testing – Multiple Regression

Table (3-9): Results of Hypothesis Testing Using Multiple Regression

Variable	Coefficient (B)	t-value	Significance (p)
Constant	0.521	1.919	0.059
AI Adoption	0.477	5.000	0.000
Organizational Factors	0.382	3.926	0.000

- Coefficient of Determination **R^2 = 0.649**
- Adjusted **R^2 = 0.639**

Interpretation of Results

1. **AI adoption** has a positive and statistically significant effect on cost reduction (**B = 0.477, p < 0.01**), supporting **Hypothesis H1**, which posits that the adoption of AI technologies contributes to reducing operational and technical costs.
2. **Organizational factors** also have a positive and statistically significant effect on cost reduction (**B = 0.382, p < 0.01**), supporting **Hypothesis H2**, which assumes that data quality, governance, and organizational integration enhance the cost-reduction effect.
3. The value of **R^2 = 0.649** indicates that the two independent variables (AI adoption and organizational factors) explain approximately **65% of the variance** in the dependent variable (cost reduction). This is a relatively high proportion, demonstrating the strength of the model.

Hypothesis Testing – Simple and Multiple Regression

Table (3-10): Results of Hypothesis Testing Using Simple and Multiple Regression

Hypothesis	Coefficient (B)	t-value	Significance (p)	R^2
H1: AI Adoption → Cost Reduction	0.731	9.466	0.000	0.569
H2: Organizational Factors → Cost Reduction	0.713	8.555	0.000	0.518
H3: Joint Model (AI + Organizational Factors)	AI = 0.477, ORG = 0.382	AI = 5.000, ORG = 3.926	AI = 0.000, ORG = 0.000	0.649

Interpretation

- **Hypothesis H1:** Results indicate that AI adoption has a **positive and significant effect** on cost reduction (**B = 0.731, p < 0.01**), explaining **56.9% of the variance**.
- **Hypothesis H2:** Results show that organizational factors also have a **positive and significant effect** on cost reduction (**B = 0.713, p < 0.01**), explaining **51.8% of the variance**.
- **Hypothesis H3:** When combining both independent variables, each remained positive and significant (**AI = 0.477, ORG = 0.382**), with explanatory power increasing to **R^2 = 0.649**. This means that the joint model accounts for nearly **65% of the variance** in cost reduction.

Conclusions

1. Results of the descriptive analysis revealed that the level of **AI technology adoption** was high (mean = 4.00), reflecting respondents' conviction regarding the usefulness of these technologies in enhancing operational efficiency and reducing costs.

2. Findings indicated that **organizational factors** such as data quality, system integration, and institutional readiness remained uneven (mean = 3.59), suggesting variability in the extent to which institutions are prepared to leverage AI effectively.
3. Reliability tests (**Cronbach's Alpha**) produced positive results for all dimensions (>0.75). In addition, the high KMO value (0.801) and the significance of Bartlett's Test further support the credibility of the research instrument and its suitability for factor analysis.
4. The correlation matrix demonstrated strong positive relationships between the independent variables (**AI adoption and organizational factors**) and the dependent variable (**cost reduction**), confirming the validity of the study's conceptual model.
5. Hypothesis testing using both simple and multiple regression supported all proposed hypotheses. Results showed that **AI adoption and organizational factors together explained nearly 65% of the variance in cost reduction**, which is considered a high explanatory power, demonstrating the strength of the analytical model.

Recommendations

1. **Enhance the adoption of AI technologies** within the studied institutions, particularly in the areas of automation, decision support, and customer service, given their direct impact on cost reduction.
2. **Improve data quality and governance**, as they are essential prerequisites for the success of AI applications and for ensuring the accuracy and reliability of their outputs.
3. **Develop technological infrastructure and strengthen system integration** between existing digital platforms and AI applications, thereby reducing waste and improving operational efficiency.
4. **Foster a flexible organizational culture** by implementing training and capacity-building programs for employees, aimed at increasing acceptance of change and enabling effective interaction with AI systems.
5. **Pay greater attention to cybersecurity measures** to protect systems and reduce costs associated with breaches or security failures.
6. **Adopt AI as a strategic approach** in managing IT and financial services costs, and link its outcomes with institutional performance indicators.
7. **Conduct further applied studies in other sectors** (such as healthcare, education, and public services) to test the generalizability of findings and broaden the practical impact of the research.

Future Prospects

The future of AI-driven automation in the IT and economic services sector has significant prospects for innovation, efficiency, and disruptive development. As technology continues to evolve and AI capabilities advance, several critical characteristics and opportunities are anticipated to shape the future landscape of AI in IT and financial services.

Conclusion

The incorporation of AI-driven automation in the IT and financial services sectors signifies a radical change that ensures substantial economic benefits, increased operational efficiency, and superior customer experiences. This examination investigated the many programs, financial impacts, challenges, and future prospects of AI in IT and financial services, emphasizing its potential to transform the economic landscape and foster sustainable growth in an increasingly digital economy.

Key Findings

Economic Impacts:

AI-driven automation enhances operational efficiency, lowers costs, and boosts productivity across many IT and financial service sectors. Financial institutions are utilizing AI technologies to enhance returned-workplace operations and improve customer assistance through chatbots and digital assistants, achieving significant operational improvements and cost reductions.

Challenges and Considerations:

Although AI has transformative potential, its implementation in IT and financial services presents issues including technical complexity, regulatory compliance, workforce transformation, cybersecurity threats, and ethical considerations. Confronting these challenges necessitates a proactive approach that reduces risks, promotes innovation, and guarantees the responsible implementation of AI in accordance with ethical standards and customer trust.

Future Prospects:

The future of AI in IT and financial services is defined by technological advancements, enhanced applications in personalized financial services and regulatory compliance (RegTech), and wider economic effects through job creation, workforce transformation, and inclusive access to financial technology. Collaboration among financial institutions, fintech firms, and regulatory authorities will Innovation, ecosystem integration, and economic services are essential to establish a digital-first strategy for financial services.

Recommendations

As financial establishments navigate the complexities of adopting artificial intelligence, several strategic recommendations can be proposed:

Investing in AI Talent and Skills Development:

Encourage a culture of ongoing learning and professional development to provide personnel with the requisite skills to effectively utilize AI technology. Investment in human reskilling and upskilling efforts is essential to prepare staff for AI-driven changes in roles and responsibilities.

Strengthening Data Governance and Cybersecurity:

Establish robust data governance frameworks and advanced cybersecurity protocols to safeguard sensitive information, mitigate cyber threats, and ensure adherence to regulatory requirements. Priority must be given to information privacy and ethical considerations in AI deployment to sustain consumer trust and regulatory integrity.

Promoting Ethical AI Practices:

Incorporate principles of equity, clarity, and accountability into AI design and decision-making methodologies. Efforts should focus on minimizing biases in AI algorithms and guaranteeing inclusive access to AI-driven IT and financial services, thereby enhancing public trust and encouraging equitable outcomes.

Fostering Collaboration and Innovation:

Foster strategic alliances with fintech startups, industry groups, and academic institutions to enhance innovation and ecosystem integration. Collaborative efforts must focus on developing AI-driven solutions that boost operational performance, improve client engagement, and strengthen competitive advantage in global markets.

AI-driven automation possesses significant potential to transform the IT and economic services sectors by improving efficiency, enriching customer experiences, and fostering sustainable

growth. By addressing difficulties responsibly, employing proactive methods, and leveraging collaborative engagement, financial institutions can seize the chance to spearhead AI innovation and sustain competitive management in the digital era.

By strategically investing in AI talent, ethical governance, and creative applications, financial institutions can navigate the challenges of AI adoption and cultivate a flexible, inclusive, and technologically advanced future.

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