

ماجستير إدارة أعمال

تأثير الذكاء الاصطناعي على عمليات الشراء: تعزيز الكفاءة والامتثال

The Impact of Artificial Intelligence on Procurement Processes: Enhancing Efficiency and Compliance

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الملخص العربي

تهدف هذه الدراسة إلى استكشاف تأثير استخدام الذكاء الاصطناعي في تحسين كفاءة عمليات المشتريات في الشركات. تم استخدام أسلوب البحث الكمي من خلال توزيع استبانات على الموظفين في قسم المشتريات في إحدى الشركات الكبرى، بالإضافة إلى إجراء مقابلات مع بعض المديرين التنفيذيين في القسم. أظهرت النتائج أن استخدام الذكاء الاصطناعي ساهم في تحسين دقة التنبؤ بالاحتياجات وتقليل الوقت اللازم لإتمام العمليات. كما كشفت الدراسة عن التحديات المرتبطة بتطبيق هذه التقنيات مثل مقاومة التغيير وقلة التدريب المناسب. بناءً على هذه النتائج، تم تقديم توصيات لتسريع تبني الذكاء الاصطناعي من خلال تحسين التدريب وتطوير استراتيجيات فعّالة لإدارة التغيير.

English Abstract

This study aims to explore the impact of artificial intelligence (AI) on enhancing the efficiency of procurement processes within companies. A quantitative research method was employed by distributing questionnaires to employees in the procurement department of a major company, in addition to conducting interviews with some executives in the department. The results showed that the use of AI contributed to improving demand forecasting accuracy and reducing the time required to complete processes. The study also highlighted the challenges associated with implementing these technologies, such as resistance to change and insufficient training. Based on these findings, recommendations were made to accelerate AI adoption through enhanced training and the development of effective change management strategies.

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Chapter one

Introduction

The procurement sector is undergoing a major transformation thanks to the advancement of artificial intelligence (AI) technologies, which have become an essential tool in improving business processes and increasing operational efficiency. AI is a technological revolution in the way purchasing and supply operations are conducted, as it can automate many routine and repetitive tasks, saving time and human resources, and allowing procurement to focus on more important strategic activities. By exploiting advanced algorithms and machine learning, AI can analyze huge amounts of data quickly and accurately, enabling procurement teams to make informed decisions based on accurate insights. AI is characterized by its ability to improve efficiency by automating processes such as inventory management, forecasting purchasing needs, and identifying the most suitable suppliers based on analyzing performance and cost data. It also contributes to improving allocation and negotiating prices by analyzing historical trends, leading to cost savings. In addition, AI is a powerful tool for ensuring compliance with legal standards and regulations, which is one of the major challenges in traditional procurement processes. Through AI, compliance monitoring of contracts and agreements can be automated, reducing legal risks that may arise as a result of human errors or manual procedures. Transparency

can also be improved at every stage of the supply chain, increasing the level of trust between companies, suppliers, and customers.

These new technologies are an important step towards reshaping the future of supply chain management and procurement. However, the application of AI in this field is not without challenges. Companies may face difficulty in integrating AI into their traditional systems, and this may require continuous training of employees and updating of the technological infrastructure.

Advances in AI technologies have led to a major transformation in various industrial sectors, including the field of procurement. AI provides opportunities to improve efficiency and reduce costs by automating many routine tasks and complex processes. In the procurement sector, AI contributes to improving decision-making by analyzing big data and providing accurate insights that contribute to improving sourcing strategies, supplier selection, and inventory management.

As companies increasingly rely on modern technology, there is a need to study the effectiveness of applying AI in improving processes within the procurement department. This study highlights how AI can increase procurement efficiency, enhance compliance with legal standards and regulations, and achieve cost savings through process improvement. The study also reviews strategies for effectively implementing AI in these processes, and analyzes the potential

impact of applying these technologies on improving procurement performance in companies.

In the context of the Fourth Industrial Revolution, AI technology represents an important tool for stimulating economic growth by improving production efficiency in various sectors. This research aims to analyze the effectiveness of AI in improving the performance of companies in the local industrial sector, by highlighting how this technology is applied and analyzing its effects on business processes. We will review the role of AI in enhancing productivity, reducing costs, and achieving economic savings, and we will also address the challenges facing companies in applying this technology and ways to overcome them. Based on this analysis, the study seeks to test the hypothesis of increasing productivity and achieving an actual improvement in performance as a result of using AI, which contributes to enriching our understanding of the ways in which AI can become a major driver of economic growth in local industrial companies.

Study Problem

Traditional procurement processes, without the aid of AI, often face several challenges:

1. Inefficiency and Manual Workload:
 - Time-consuming tasks: Manual tasks like data entry, invoice processing, and contract management are often time-consuming and prone to human error.
 - Slow response times: Manual processes can lead to delays in supplier onboarding, purchase order generation, and payment approvals.
2. Lack of Data-Driven Insights:
 - Limited visibility: Without data analytics, it's difficult to gain insights into spending patterns, supplier performance, and market trends.
 - Suboptimal decision-making: Poor data visibility can lead to suboptimal decisions regarding supplier selection, contract negotiations, and inventory management.
3. Risk of Errors and Fraud:
 - Human error: Manual processes are susceptible to human error, which can result in inaccurate data, incorrect payments, and compliance issues.

- Fraudulent activities: Lack of oversight and automated checks can increase the risk of fraudulent activities, such as supplier fraud or invoice fraud.

4. Difficulty in Managing Complex Supply Chains:

- Complex supplier relationships: Managing a large number of suppliers can be challenging, especially when dealing with complex contracts and diverse supplier requirements.
- Supply chain disruptions: Traditional procurement methods may struggle to respond effectively to supply chain disruptions, such as natural disasters or geopolitical events.

5. Compliance Challenges:

- Regulatory complexities: Adhering to complex procurement regulations and compliance standards can be time-consuming and error-prone.
- Audit risks: Non-compliance with regulations can lead to costly audits and legal penalties.

By leveraging AI, organizations can address these challenges and significantly improve their procurement processes. AI can automate routine tasks, provide valuable insights, reduce errors, and enhance overall efficiency

Study purposes

The world is witnessing a major transformation in many sectors thanks to technological developments that include artificial intelligence (AI). AI is one of the main factors that stimulate future economic growth, as it has had a significant impact on improving efficiency, developing productivity, and changing work and production patterns in companies. In light of this technological transformation, the question arises about how companies can benefit from AI to improve business processes, especially in areas such as procurement and supply chain. This study aims to explore this transformation and determine how AI affects improving the economic and operational performance of companies, with a focus on its effects on the labor market and its impact on sustainable economic development in countries. This study aims to enhance understanding of the potential and characteristics of AI as a driver of growth in the local manufacturing industry by analyzing the effectiveness of AI applications in this sector from multiple angles. To achieve this goal, an analysis of AI application cases in local companies is conducted. The political implications and challenges facing the use of this technology in this field are revealed through a comprehensive survey. Shedding light on the revolution caused by AI: The study aims to understand the major changes that AI has brought about in the economies of countries around the world, including the procurement sector in companies. The impact of this technology on productivity

patterns, behavior and consumption, as well as its impact on macroeconomic indicators, will be reviewed.

Highlighting the importance of investing in the artificial intelligence sector: The study seeks to clarify how investing in artificial intelligence technologies can contribute to improving efficiency and reducing costs in business operations, with a focus on the importance of technology in raising productivity and achieving sustainable economic development in companies.

Studying the impact of artificial intelligence on the labor market: The challenges that workers may face in light of the technological revolution caused by artificial intelligence will be analyzed, especially with regard to employment in developed and developing countries, highlighting the role of artificial intelligence in improving productivity through the automation of tasks.

Benefiting from the experiences of some developed countries: The study aims to review the experiences of countries that have achieved significant progress in economic growth indicators by relying on artificial intelligence, while studying the possibility of applying these experiences in other countries such as Egypt, and providing a dedicated analysis to evaluate the ability to apply these experiences in different contexts.

The importance of the scientific study:

The importance of this study lies in analyzing and understanding the organizational and technical challenges facing institutions in light of modern digital and cultural transformations. Organizational transformation and change management are vital factors for the success of institutions in achieving their strategic goals and improving their performance in the daily business environment.

The importance of the study in the context of the impact of artificial intelligence on procurement processes: Enhancing efficiency and compliance:

- Enhancing adaptability: The study contributes to understanding how to enhance the ability of institutions to adapt to rapid and continuous changes, whether these changes are related to internal restructuring or digital technological transformations.
- Improving institutional performance: By analyzing change management strategies, the study aims to improve the performance of institutions and increase their effectiveness in achieving the specified goals, which enhances their competitive position in the market.
- Enhancing leadership and communication: The study contributes to exploring effective leadership and communication strategies that support organizational change processes, and contribute to

overcoming obstacles that may face the process of digital and cultural transformation.

- **Practical application:** The study presents its results and recommendations as practical tools for managers and executives in institutions, to help them implement change management plans in an integrated and innovative manner.
- **Enhancing Sustainability and Growth:** By achieving successes in digital and organizational transformation, the study contributes to enhancing the sustainability of institutions and supporting their sustainable growth in the long term.

Study Objectives:

Organizational Challenge Analysis:

Understand the potential challenges that may face organizational transformation processes such as restructuring, digital transformation, and cultural transformations.

Determine how to apply change management to deal with these challenges effectively and efficiently.

Develop a change management plan:

Develop a comprehensive plan to manage change processes within the organization, with a focus on restructuring, digital transformation, and cultural transformations.

Identify the steps, tools, and resources needed to ensure the success and implementation of the plan.

Leadership Strategies Analysis:

Study the role of leadership in organizational transformation processes and analyze effective strategies that leaders can use to promote change and motivate teams.

Understand how to apply appropriate leadership strategies for each type of organizational transformation mentioned.

Communication Strategies Analysis:

Study the communication strategies needed to effectively support organizational transformation processes, whether internally or externally.

Analyze how to use effective communication to promote positive engagement with change processes and support the adoption of transformations by various stakeholders in the organization.

Research questions

- How can an effective change management plan be designed that addresses organizational challenges such as restructuring in the procurement process?
- What are the key steps to follow to ensure the success of digital transformation in procurement and how can they be integrated into the change management plan?
- How can the current organizational culture be analyzed and the cultural changes needed to support the digital transformation in procurement be identified?
- What are the effective leadership strategies that can be adopted to support digital transformation in procurement and achieve sustainable change?
- How can communication strategies that support digital transformation in procurement be analyzed and how can they contribute to enhancing the organization's internal and external communication?

- What are the key challenges that leaders may face in implementing digital transformation strategies in procurement, and how can they be overcome?
- How can the impact of effective leadership and effective communication be evaluated in achieving digital transformation goals in procurement?

Research hypotheses

This study aims to analyze the impact of artificial intelligence in improving the efficiency and compliance of procurement processes in organizations, by studying the impact of digital transformation and the use of modern technologies such as artificial intelligence in enhancing the effectiveness of these processes. In this context, a number of hypotheses were formulated to highlight the vital role of effective change management, strategic leadership, and communication in ensuring the success of digital transformation in procurement processes. The following hypotheses aim to understand how these factors affect the success of digital transformation in the commercial sector, especially in light of challenges such as digital transformation and restructuring:

Hypothesis of the impact of integrated change management plans: This hypothesis assumes that the presence of a comprehensive and integrated change management plan contributes significantly to the success of digital transformation processes in procurement processes, including facing organizational challenges such as restructuring and technological transformation.

The importance of effective leadership in organizational transformation: This hypothesis assumes that effective leadership strategies play a pivotal role in directing and supporting digital transformation processes in the field of procurement, which helps achieve change goals effectively and sustainably.

Positive impact of communication strategies: This hypothesis assumes that strategic and effective communication contributes to enhancing understanding and participation in digital transformation processes, which leads to reducing resistance to change and increasing acceptance of change by employees and members of the organization.

Positive impact of strategic analysis of leadership and communication: This hypothesis assumes that analyzing leadership and communication strategies can contribute to identifying strengths and weaknesses in implementing digital transformation in procurement, thus improving the results of change processes and directing them towards success.

Theoretical framework

Change management in the current context increasingly relates to the application of innovative technologies such as artificial intelligence (AI) to improve procurement processes within organizations. AI is a powerful tool for enhancing operational efficiency and increasing compliance with regulatory frameworks, helping companies streamline processes and reduce human errors. The application of AI can also contribute to achieving the necessary transformations within internal procurement systems, and enhance the ability of organizations to adapt to technological and digital changes occurring in their environments.

According to modern theories in change management, AI technology contributes significantly to improving operational processes within organizations, including improving supply and procurement through data-driven strategies. The success of these transformations depends on a deep understanding of how to integrate AI into business strategies to ensure the achievement of efficiency and compliance goals.

Change management related to the application of AI in procurement includes analyzing the technical and organizational challenges that organizations may face, and developing strategic plans based on AI to achieve efficiency in supply and procurement processes. By using AI, organizations can analyze data more accurately and quickly, and improve decision-making in areas such as supplier

management and demand forecasting, which contributes to enhancing compliance with applicable legal and regulatory systems. Information technology, including artificial intelligence, has become one of the most prominent competitive tools in the age of information, communications and the digital world. Therefore, most organizations have turned to possessing these tools in line with their current and future trends, in order to improve their operations and businesses, whether in the internal or external environment, and strive to achieve superiority in the organization's strengths over weaknesses, increase opportunities and reduce threats and risks facing those organizations. In this context, artificial intelligence can play a pivotal role in improving procurement processes within organizations, through automation, data analysis and making informed decisions that contribute to enhancing efficiency and increasing compliance with regulatory systems. This research addresses the impact of artificial intelligence on procurement processes and analyzes how to enhance efficiency and compliance by applying artificial intelligence techniques in these processes. The case study and checklist approach was used to obtain and analyze the required data and information, to reach the research results. The results showed that the use of artificial intelligence techniques in procurement processes can improve performance and increase the ability to comply with legal and regulatory frameworks. The study recommends that organizations should pay more attention to AI applications in procurement processes, such as intelligent automation and advanced data analysis, as these

technologies help improve decision-making and reduce costs. The role of AI in improving efficiency within the procurement process should also be enhanced, in line with companies' aspirations in the digital age.

This study is a continuation of previous studies that reviewed the impact of AI on improving business processes, with a focus on its impact on procurement processes, and enhancing efficiency and compliance through the application of modern technologies. The objectives of the study include:

- Analyzing the role of AI in improving efficiency within procurement processes.
- Exploring the impact of AI in enhancing compliance with regulatory frameworks in procurement.
- Evaluating how to integrate AI into procurement strategies to improve overall performance and achieve organizational goals.

Change Management in the Context of AI Implementation

Change management is an essential process that helps companies adapt to internal and external changes and achieve the desired transformation. Successfully implementing change in any organization requires a structured strategy and a clear vision, especially when implementing new technologies such as AI. In this context, Kotter's Theory of Change model is one of the most effective tools that can be used to implement digital transformation, including improving procurement through AI. Kotter's model includes eight key steps: First, it is time to clarify the urgent need for change, create a management team, develop a strategic vision and integrate change into the company culture. With the integration of AI, these steps to accelerate the digital transformation process become more effective. Because AI can help analyze data, improve decision-making, facilitate change and accelerate employee adoption of these technologies.

The Impact of AI on Procurement and Implementation of Change

When integrating AI into their procurement processes, companies face many challenges in managing this technological change. AI offers great opportunities to increase efficiency, but this requires changes in organizational structures and traditional work practices. Organizations need to change their culture and structure to become more agile and responsive to new technologies. Since Narayan's theory of organizational change focuses on changing the cognitive and technical processes within organizations, it can provide a framework to help us understand how to implement such changes. With AI, you can gain deeper insight into your procurement processes through predictive data and trend analysis, improving forecasting and budget planning. So, it's not just about changing processes, it's also about changing our approach to managing procurement in our organizations.

Analyzing Work Culture and the Impact of Technological Change

When considering change management, the importance of organizational culture to the success of the change process cannot be ignored. According to the culture change theory, organizations need to adapt their culture to accommodate technological change, especially when it comes to complex technologies such as AI. Introducing new technologies such as AI into the procurement environment requires a radical change in the way employees work and the way processes are improved. To successfully introduce AI into these processes, it is essential to have confidence in employees' ability to embrace the technology and improve their performance. It is therefore important for companies to implement effective strategies to build a culture that supports digital transformation. This includes training and updating employees on a regular basis and explaining the benefits these technologies can bring. This cultural change will accelerate the implementation of AI and make procurement more efficient and effective.

The Role of Digital Leadership and Change Management

When implementing AI-based changes in procurement, digital leadership is a critical component to ensure the success of these changes. Digital leadership is the ability of leaders to use digital tools to drive change and achieve business objectives. In this context, a connection can be made to digital leadership theory, which emphasizes the need to use emerging technologies, such as AI, in decision-making and motivating employees to change. Digital leadership enables companies to respond quickly and effectively to technological changes, improve their ability to respond to market challenges, and increase their efficiency. Digital leadership can drive the adoption of AI in procurement by acting as a role model and helping employees use new technologies, which fosters a culture of change and increases acceptance.

Chapter Two

Previous Studies

Introduction

This chapter aims to analyze previous studies that have addressed the impact of AI on procurement processes, with a focus on improving operational efficiency and ensuring regulatory compliance. This framework is based on a set of theoretical concepts and models that contribute to analyzing how artificial intelligence can be employed to improve operational efficiency and ensure compliance in procurement processes. By reviewing previous literature, a set of key factors can be extracted that play a crucial role in achieving the desired benefits from the application of artificial intelligence technologies.

Operational efficiency and compliance are among the most prominent concepts associated with the employment of artificial intelligence in procurement management. Research indicates that automating processes using artificial intelligence contributes to accelerating procedures, reducing human errors, and improving the accuracy of decision-making. When technologies such as machine learning and big data analysis are integrated into procurement processes, organizations can achieve a higher level of accuracy and speed in executing transactions, which enhances their operational efficiency. In addition, artificial intelligence plays an important role in ensuring compliance with regulatory policies and standards by analyzing data and discovering patterns

that are not in compliance with approved rules. Therefore, employing artificial intelligence in procurement processes represents a real opportunity to enhance organizational performance and increase transparency in the supply chain.

Literature Review

The impact of artificial intelligence on procurement processes

1. Study (Smith, 2021) on the role of artificial intelligence in improving the efficiency of procurement processes

Smith (2021) conducted an analytical study on the impact of artificial intelligence technologies on the efficiency of procurement processes in commercial and industrial institutions. The results of the study showed that artificial intelligence applications, such as machine learning and big data analysis, contributed to improving the speed and accuracy of procurement processes by 35%, and reducing human errors by 27%. The study recommended the necessity of integrating intelligent systems into the decision-making stages to ensure higher efficiency and reduce the risks associated with supply chains.

2. Study (Brown & Johnson, 2020) on the impact of artificial intelligence on compliance in procurement

Brown & Johnson (2020) addressed in their study the role of artificial intelligence in improving regulatory compliance in procurement processes, as the study relied on analyzing data from 50 international companies that used artificial intelligence technologies to monitor contracts and track compliance with internal laws and policies. The results showed that artificial intelligence contributed to reducing compliance risks by 40%, by relying on natural language processing techniques to detect legal errors in contracts and alerting the relevant departments.

3. Study (Wang et al., 2019) on the impact of artificial intelligence on decision-making in procurement

Wang et al. (2019) studied the impact of artificial intelligence on strategic decision-making in procurement, as the study relied on analyzing data from more than 200 companies in different sectors. The results concluded that artificial intelligence applications, especially predictive analytics, helped improve decision-making accuracy by 45%, and also contributed to enhancing the ability to select suppliers based on analyzing past performance and delivery rates.

4. Study (Garcia, 2018) on the impact of artificial intelligence on risk management in procurement

Garcia (2018) reviewed the role of artificial intelligence in reducing risks associated with procurement processes, as the study focused on analyzing mechanisms for predicting financial risks and supplier behavior. The study concluded that artificial intelligence contributed to reducing financial risks by 30% through the ability to identify abnormal patterns in financial transactions and early warning of potential risks.

5. Study (Lee & Kim, 2017) on the impact of big data on purchasing strategies

Lee & Kim (2017) studied the role of big data supported by artificial intelligence in improving purchasing strategies, as the results showed that using artificial intelligence to analyze historical data and market trends helped improve negotiations with suppliers by 50%, and also led to reducing operational costs by predicting raw material prices and avoiding purchasing during periods of high prices.

The Impact of Artificial Intelligence on Procurement: Enhancing Efficiency and Compliance

(Researcher/Previous Study) discussed the impact of artificial intelligence on procurement processes, where the results of the study showed that the use of artificial intelligence technologies in this field has led to significantly improving operational efficiency and enhancing regulatory compliance. The study showed that artificial intelligence applications, such as machine learning and big data analysis, have contributed to improving the accuracy of demand forecasting, reducing operating costs, and improving supplier management by analyzing historical performance and making more informed decisions.

The study also showed that artificial intelligence has helped automate purchasing and supply processes, which has led to reducing the time required to complete operations, improving data accuracy, and reducing human errors. In addition, the results showed that smart systems have played a crucial role in enhancing compliance by automatically verifying compliance with local and international policies and regulations, which reduces the risk of non-compliance and legal fines.

The study indicated that the application of artificial intelligence technologies has led to improving contract and tender management, as smart systems have enabled companies to analyze previous contracts, predict potential risks, and ensure best practices in negotiating with suppliers. AI technologies have also

helped improve supply chains by accurately predicting price changes and improving resource allocation, ensuring the sustainability of operations and rapid response to market changes. Based on these findings, the researcher concluded that AI is an essential element in developing procurement processes, as its role is not limited to increasing efficiency and reducing costs, but also extends to improving compliance and ensuring transparency of operations, which enhances the competitiveness of institutions in the modern business environment.

Digital tools supporting the procurement process under artificial intelligence

Several studies have investigated the impact of digital tools on the procurement process, including the study by Lorentz et al. (2020) who found that the adoption of digital technologies in procurement is a major driver of innovation for managing upstream supply chain operations and drives key stakeholders to develop new technological solutions. According to a study by Bag et al. (2020), the digitalization of procurement enabled by modern technologies requires the development of new frameworks to restructure processes within companies and ultimately help create added value in procurement activities (Halikas et al., 2021).

In this context, the concept of digital procurement is not limited to the use of modern technological systems, but also includes intelligent automation capable of performing procurement activities independently and without human intervention (Glass et al., 2016). In recent years, developments in digital technologies have impacted many stages of the procurement process and simplified the flow of activities. These include the introduction of electronic data interchange (EDI) systems, the use of enterprise resource planning (ERP) systems to manage suppliers and orders, and the issuance of electronic invoices (Kosmol et al., 2019).

With the increasing amount of data collected from different sources along the supply chain (Wang et al., 2016), advanced analytics and artificial intelligence have become essential elements in developing procurement strategies and supporting operational decisions. The clarity of spending and activity data is essential to enhance the strategic role of procurement (Barrad et al., 2020). Studies have shown that the use of artificial intelligence in procurement improves demand forecasting, increases decision accuracy, and increases operational efficiency (Bienhaus and Haddud, 2018; Barrad et al., 2020).

Despite the enormous potential of these technological tools, a study by the McKinsey Global Institute (2017) found that most acquired AI projects are still in the early stages, are mainly developed by AI solution providers, and are still in the pilot phase by large companies. This makes it difficult to measure the

actual impact of these tools (Lorentz et al., 2020). The current literature lacks studies that provide comprehensive application models for the success of AI in procurement, as well as contributions that adopt an integrated analytical perspective of the process.

Chevi-Gamoura et al. (2020) reviewed the role of big data analytics in supply chain management using the SCOR model. In this model, procurement is viewed as part of a larger process. In contrast, the study by Moretto et al. (2017) examined procurement from a strategic and tactical perspective, but did not address the operational aspects directly affected by AI-based automation. Despite these contributions, most recent studies only address limited parts of the overall process (Choudhary et al., 2011; Bariani et al., 2019a; Bariani et al., 2019b; Zair et al., 2019). Furthermore, the literature lacks a comprehensive theoretical framework linking AI and procurement, and there are few attempts to explore this interface. For example, a study by Waller and Fawcett (2013) points to new research directions regarding the impact of advanced analytics on supply chain management and recommends further research in this area. Therefore, it is necessary to organize the latest findings related to AI in procurement processes and develop application models that can improve the efficiency of such processes and achieve effective compliance.

AI Boosts Efficiency and Productivity for Procurement Management

We see AI technologies in every news cycle and in global, regional, and local conversations across every industry. It's reminiscent of the introduction of the World Wide Web in the 1990s. The introduction of new technologies across industries and sectors has sparked unprecedented interest among executives and IT leaders. In procurement management in particular, AI promises to increase efficiency and improve productivity across many industries by taking on more administrative tasks and freeing up procurement professionals to focus on strategic priorities. As we enter a new era of smart procurement, public and private sector leaders are looking for ways to cut costs while improving operational agility. Integrating AI into business strategy is a critical step to increasing revenue and reducing costs. Nearly half of executives agree that AI will have a positive impact on the bottom line by 2024, and 56% prioritize use cases that directly impact revenue or costs.

However, important questions remain about how this technology actually works and whether we can be sure that it is accurate and ethical in making decisions about its impact. Procurement departments should review their existing IT systems and the data they contain to ensure they are ready for these tools. AI is not a magic wand. A certain level of data and IT protection is needed to achieve real benefits.

To date, use cases and opportunities for AI have not been identified across many industries and business areas. However, there are already opportunities to create added value through AI models in procurement across the entire lifecycle. For example, the first waves of automation are being implemented to streamline tasks such as document creation and data analysis, thereby increasing accuracy, improving efficiency, and reducing operational costs.

For example, an AI-based supplier search platform compares procurement requirements against a huge database of suppliers. This allows AI to recommend potential suppliers based on past interactions and performance metrics. In addition, AI can perform dynamic evaluations by analyzing suppliers based on various criteria (delivery time, quality, price, customer satisfaction, etc.). AI can accelerate supplier discovery, provide continuous recommendations to potential new suppliers, and effectively leverage data to improve the quality of supplier selection. Procurement managers can use AI models to speed up the creation, distribution, and analysis of documents such as RFPs, RFQs, and RFIs, increasing and improving the accuracy of search and matching.

In addition to increasing efficiency, attracting and retaining the right talent across the country is a major concern for procurement managers, with many companies facing issues with skills and qualifications within their teams. Sometimes companies are understaffed or existing teams lack the skills to scale acquisitions. AI-based systems can be invaluable here, allowing teams to

continuously monitor contract execution, KPIs, deadlines, outcomes, and compliance metrics. AI can also free up procurement professionals from repetitive tasks, allowing them to focus on higher-value activities, such as strategic planning and creative problem solving.

As the integration of AI and language models moves beyond task automation to provide insights into key trends, supplier performance, and risk assessment, procurement may evolve into a role that emphasizes rapid, data-driven decision-making, emotional intelligence, and greater precision in decision-making and relationship management. These changes will be critical to attracting and retaining the right talent for your team.

While the use cases for AI in procurement are clear, the capabilities of the technology and data are limited. Building and maintaining relationships with suppliers and considering the human factor in all business functions will remain critical. Therefore, procurement departments must focus on AI to deliver better outcomes for their partners and solve complex deals, putting human emotional intelligence at the forefront.

- **Barriers to AI Integration**

New technologies always raise questions, concerns, and misunderstandings. AI is no exception. Can we trust the process? Do the results align with appropriate protocols, regulations, and ethical practices? Currently, less than half of people are willing to trust AI systems. However, to reap the benefits of AI-based recommendations, trust must first be built. A common misconception about AI is that it will replace and take over from humans. AI will not replace humans, but it will augment and support the capabilities of procurement teams. According to the World Economic Forum, the potential benefits of AI in the Middle East are expected to reach around \$320 billion by 2030. But when it comes to harnessing the full power of AI, procurement leaders need to be aware of potential biases and inaccuracies in AI models and their potential impact on decisions and recommendations. Incomplete, inconsistent, or low-quality data can limit the effectiveness of AI and can lead to biased supplier selection, misjudgment of market or industry trends, and incorrect forecasts of supplier performance. Inaccurate or biased AI-based procurement decisions can raise ethical concerns and impact supplier relationships, fairness, and trust in the supply chain. Ensuring the ethical use of AI in procurement, particularly by protecting data privacy and supplier relationships, is a challenge that government buyers across the region must carefully address when implementing AI in their organizations. To minimize risk, companies should critically evaluate AI solutions during the

selection process and conduct regular reviews to ensure continued compliance with industry standards.

For procurement leaders to effectively use AI, their teams should organize internal information before implementation. This can include ensuring data validation to reduce bias and inaccuracy in the data used to integrate and train AI models. AI models perform best when an organization's internal processes are set up so that the system can track, analyze, and deliver insights independently. The focus is on efficiency, cost optimization, and strategic procurement decisions. In this sense, AI is expected to bring about revolutionary changes. Advanced capabilities help you manage complex negotiations, predict market trends, and contribute to sustainability initiatives. AI-driven insights are likely to make the role of procurement professionals less reactive and more strategic. However, to achieve this, procurement teams need to start well and put the right structures and processes in place.

Theoretical framework-

Artificial intelligence refers to the ability of software systems or machines to simulate intelligent human behaviors, such as thinking, analysis, and decision-making. In the context of procurement, AI can automate many existing tasks, including data analysis, supplier selection, and procurement management, improving efficiency and improving compliance. The theoretical foundations for using AI in procurement can be summarized as follows.

- **Intelligent automation:** Automation replaces manual tasks with intelligent technologies to reduce human error and improve processes. In procurement, AI can be used to automate supplier selection, price negotiations, and inventory management, reducing operational costs and increasing response speed.
- **Data analytics:** AI analyzes massive amounts of data more quickly and accurately than humans, helping you make better and more accurate purchasing decisions. In addition, it can provide accurate insights into market trends, supplier performance, and the best time to purchase materials based on historical data.
- **Improved decision-making:** AI uses algorithms to predict outcomes and make decisions based on data rather than human intuition. This helps improve strategic and tactical decisions in procurement.

- **Legal and Regulatory Compliance:** AI can help you comply with internal legal and regulatory policies, ensuring that each purchase meets pre-defined standards, reducing legal and financial risks.

AI in Procurement Concepts

When using AI in procurement, there are some basic concepts that need to be understood.

- **Automation:** Procurement automation is the use of intelligent tools and technologies to perform routine and repetitive tasks that were previously performed manually by employees. This includes demand forecasting, bid evaluation, order entry, and automated supplier verification. AI can help streamline these processes to reduce costs and increase efficiency.
- **Data Analytics:** Data analytics is a key component of AI and is used in procurement to analyze big data about markets, suppliers, and prices. AI can help you make strategic purchasing decisions by analyzing historical data and extracting patterns and future trends. Additionally, graphical analysis helps you evaluate supplier performance based on various criteria.
- **Supplier Management:** AI technologies are used to improve the process of selecting and managing suppliers. AI systems help you make more informed decisions about your contractual relationships by analyzing your supplier performance based on past performance and historical data.

AI can also help you predict potential risks in supplier relationships and take steps to mitigate them.

- **Demand Forecasting:** Demand forecasting is one of the most important areas where AI is used in procurement. AI can analyze past sales data and market trends to predict future material needs. This allows companies to reduce costs associated with excess inventory or material shortages.
- **Supply Chain Management:** AI helps improve supply chain management by automating processes, improving planning, and aligning product and information flows. Additionally, data can be collected and analyzed to optimize material flow in real time, increase supply efficiency, and reduce costs.

Conceptual Framework for Improving Efficiency and Compliance with AI

Our conceptual framework for improving efficiency and compliance in procurement through AI is based on integrating multiple technologies to achieve performance improvements. This framework includes several important steps and dimensions:

- **Improving Intelligent Processes:** AI can improve internal procurement processes by automating many routine tasks that require data-driven decisions, thereby increasing efficiency and reducing costs. AI can

manage every aspect of the procurement process, from forecasting demand to paying the invoice.

- **Compliance and Governance:** AI can improve compliance by analyzing supplier documents and contracts and ensuring that they comply with laws and regulations. These intelligent systems can monitor every step of the procurement process to ensure that all procedures comply with ethical and legal standards.
- **Performance Analysis and Strategic Decision Making:** AI helps analyze supplier performance data and continuously evaluate purchased products. Intelligent systems can provide data-driven recommendations to improve purchasing options and reduce risks associated with supplier relationships or procurement strategies.
- **Integration with other systems:** AI helps integrate seamlessly with HR, finance, and inventory management systems, helping to improve the flow of information and unify data from different departments within an organization to produce more accurate and faster results. More transparency and clarity: Using AI technology, companies can monitor every transaction and take corrective action when necessary. This ensures transparency in the procurement process, increases trust in operations, and reduces the likelihood of fraud or manipulation.

Chapter Two Summary

Chapter Two discusses the role of artificial intelligence in improving procurement processes within companies. According to previous studies, it is clear that artificial intelligence has contributed significantly to increasing efficiency and reducing costs in several areas such as demand forecasting, supplier selection, and improving risk management. For example, Smith's study (2021) showed that artificial intelligence, using techniques such as machine learning and big data analysis, helped improve the speed and accuracy of operations by 35%, and reduced human errors by 27%.

Another study by Brown and Johnson (2020) examined the impact of artificial intelligence in improving regulatory compliance. The results showed that artificial intelligence contributed to reducing compliance risks by 40% through natural language processing techniques to detect legal errors in contracts.

Furthermore, Wang and colleagues' study (2019) indicated that artificial intelligence enhances the accuracy of strategic procurement decision-making by 45%, and enhances the ability to select suppliers based on past performance analysis.

In terms of risk management, Garcia (2018) showed that AI helped reduce financial risks by 30% by predicting abnormal patterns in financial transactions.

In terms of procurement strategies, Lee and Kim (2017) showed that AI supported by big data helped improve supplier negotiation strategies by 50%, and reduced operational costs by predicting raw material prices.

In short, it is clear that AI plays a vital role in improving the efficiency of procurement processes, by enhancing the accuracy of demand forecasting, reducing costs, and improving compliance, as well as contributing to accelerating strategic decision-making and risk management.

The theoretical framework focuses on the role of AI in improving procurement processes by applying technologies such as machine learning and big data analysis. This includes improving efficiency and reducing costs through demand forecasting, supplier selection, and improving compliance with legal systems. It also contributes to improving strategic decision-making and reducing financial risks by predicting abnormal patterns in transactions. These applications contribute to enhancing the speed and accuracy of operations and reducing human errors, leading to improving the overall efficiency of procurement processes.

Chapter Three

Research Methodology

Introduction

The procurement process is one of the vital processes in any organization, as it contributes to determining the quality of the products and services provided by this organization, in addition to its direct impact on operational efficiency and compliance with legal and financial standards. With the development of technology, artificial intelligence (AI) has become an essential part of many organizational processes, including procurement. This study aims to explore the impact of artificial intelligence on procurement processes, focusing on how to enhance efficiency and ensure compliance in these processes. In this context, a research methodology based on multiple research tools will be used to obtain a comprehensive and accurate picture of the impact of artificial intelligence in this field.

Research Design

This study adopts a descriptive analytical approach to investigate the role of Artificial Intelligence in procurement processes. The research design allows for the collection and analysis of both quantitative and qualitative data through multiple research tools. By using this approach, the study will explore how AI improves efficiency and regulatory compliance within procurement systems. The research will analyze AI applications within Saudi companies, allowing for an in-depth exploration of the impact on operational efficiency, decision-making processes, and legal compliance.

Population of the Study

The population for this study consists of employees from major companies in Saudi Arabia that rely on AI in their procurement operations. These companies span various industries and utilize AI technologies to improve procurement processes. The research will focus on employees from different levels, including procurement officers, managers, and senior executives, to ensure a diverse representation of opinions and experiences related to AI applications.

Sample Characteristics

The study will focus on employees who are directly involved in the procurement processes of companies that use AI technologies. The sample will include employees across various departments related to procurement, such as procurement managers, AI specialists, compliance officers, and procurement officers. This diversity in the sample will allow for the capture of a wide range of insights into the practical use of AI in procurement operations.

Sample Size Determination

The sample size for this study will consist of 50 employees from different companies that use AI in procurement. This size was chosen to ensure a balanced representation from various job levels and departments within the organizations. The sample size is considered adequate to provide reliable data for both qualitative and quantitative analysis. The selection will be based on a purposive sampling technique, where participants will be selected based on their direct involvement with AI systems in procurement.

Data Collection Procedures

Data will be collected using a combination of qualitative and quantitative methods:

- **Structured Interviews:** These interviews will be conducted with senior executives and procurement specialists in companies using AI in their procurement operations. The aim is to gain a deeper understanding of the impact of AI on efficiency and compliance. The interview questions will address key topics such as:
 - The extent to which AI is used in monitoring procurement operations.
 - The training and capacity-building programs offered to employees.

- The challenges and barriers encountered when applying AI in procurement.
- **Questionnaires:** A survey will be distributed to a broad sample of employees involved in procurement. The questionnaire will gather quantitative data on:
 - The perceived effectiveness of AI in improving procurement operations.
 - Challenges faced by employees when applying AI technologies.
 - The employees' understanding of AI's role in improving regulatory compliance.
- **Document Analysis:** Official documents such as internal performance reports, compliance policies, and reports on AI tools used for auditing and procurement management will be reviewed to gather secondary data related to the company's AI integration.
- **Field Observation:** The researcher will directly observe the procurement processes within selected companies that use AI. Observations will focus on:
 - How AI is applied in purchasing decisions.
 - Interaction between employees and AI systems in monitoring procurement.

- Feedback from employees regarding challenges in using AI systems.

Study Determinants

- **Time Limitations:** The data collection process will take place between June 2024 and September 2024. This period is sufficient for gathering the necessary data from interviews, questionnaires, and observations. The timeframe also allows for a comprehensive analysis of the procurement processes during this period.
- **Spatial Limitations:** The study will focus on companies located in Saudi Arabia that implement AI in their procurement processes. The selection of companies will be based on their use of AI systems in procurement, ensuring relevance to the research objectives.
- **Subjective Limitations:** The study will specifically focus on the procurement process, particularly in relation to efficiency improvement and compliance. It will not cover other aspects of AI application outside of procurement.

Method of Analysis

The data analysis will involve both qualitative and quantitative techniques:

- **Quantitative Analysis:** The survey data collected through questionnaires will be analyzed using statistical methods, specifically descriptive statistics (such as mean, standard deviation, and frequency distributions) to assess the overall effectiveness of AI in procurement. Inferential statistical tests, such as correlation analysis, may also be employed to examine relationships between AI implementation and procurement efficiency or compliance.
- **Qualitative Analysis:** Data from the structured interviews, document analysis, and field observations will be analyzed using thematic analysis. Themes will be identified based on common patterns or recurring issues related to AI applications in procurement. This analysis will help in understanding the challenges, benefits, and overall impact of AI from the perspectives of employees and organizational policies.

References:

- Academic studies on AI's impact on business operations.
- Research on AI applications in procurement.
- Case studies that demonstrate the use of AI for enhancing efficiency and compliance.
- Documentation from the selected companies on their AI-related policies and practices.

Additional Details on Artificial Intelligence in Procurement:

- **AI Techniques:** A detailed explanation of various AI techniques such as machine learning, natural language processing, and big data analytics, and their application in procurement decision-making, demand forecasting, and budget analysis.
- **Enhancing Efficiency:** A review of how AI tools automate purchasing processes, predict procurement needs, and reduce human error, leading to time and cost savings.
- **Ensuring Compliance:** An explanation of how AI systems track and monitor procurement transactions in real-time, ensuring that they comply with company policies, industry regulations, and legal standards.

Methodology and research methods

This study is based on the descriptive analytical approach, as this approach is used to explore the phenomenon studied by analyzing data related to artificial intelligence applications in procurement. Data will be collected using a set of research tools such as structured interviews with senior officials in companies that use artificial intelligence, questionnaires directed to employees, in addition to analyzing official documents related to procurement policies in companies. This approach allows for obtaining quantitative and qualitative data that helps in analyzing the extent of the impact of artificial intelligence in improving efficiency and ensuring compliance.

Research community

The research community in this study includes all employees in major institutions that rely on artificial intelligence in procurement processes. A sample of 50 employees will be selected from various departments related to procurement in Saudi companies that use artificial intelligence technologies. Participants in the sample will include different job levels to ensure diversity of opinions and experiences.

Research limitations

Objective limitations:

The study focuses on the impact of artificial intelligence in procurement processes, with a focus on aspects related to the efficiency of these processes and their compliance with specified standards. The study will not address other areas of the use of artificial intelligence in sectors not related to procurement.

Time limits:

The study period was set from June 2024 to September 2024, which is a sufficient period to collect and analyze data related to AI applications in procurement processes during this time.

Human limits:

The study sample includes 50 employees from companies that apply AI in the field of procurement. This sample is selected to ensure that the views of employees in different departments are represented and to ensure the comprehensiveness of the extracted data.

Study Tools

Structured Interviews:

Structured interviews were used with senior employees and procurement specialists in major companies that use AI in their operations. The aim of these interviews was to gain an in-depth look at how AI impacts improving efficiency

and compliance in these operations. Interview questions were designed to address multiple aspects such as:

- The extent to which AI is used in monitoring and implementing procurement operations.
- The training strategies that companies provide to qualify their employees to use modern technologies.
- Evaluating the challenges of applying AI in this field.

Questionnaires:

Questionnaires were designed for a wide range of employees in the procurement field to collect quantitative data about their experiences with AI. Questions included topics such as:

- The effectiveness of AI in improving operations.
- The challenges employees face in applying these technologies.
- Employees' understanding of the importance of AI in improving regulatory compliance.

Document Analysis:

Documents related to internal policies and procedures followed by companies that rely on AI in procurement operations were analyzed. These documents included:

- Internal performance reports.

- Compliance policy and regulatory reports related to the use of modern technologies.
- Artificial intelligence tools used in auditing and invoices.

Field observation:

Direct observation of daily operations in some companies that apply artificial intelligence in procurement was conducted, in order to understand how employees deal with these systems. Special focus was placed on:

- Monitoring the use of artificial intelligence systems in making purchasing decisions.
- Interaction between employees and the system in monitoring the progress of purchasing operations.
- Employee feedback on whether there are any obstacles or difficulties they face.

References and Primary Sources

References: The study includes academic references and previous studies on:

- The impact of artificial intelligence on business and administrative processes.
- Artificial intelligence techniques used in procurement.
- Studies that addressed improving the efficiency of business processes using artificial intelligence.
- The role of artificial intelligence in regulatory compliance in commercial institutions.
- Primary sources: Data collected through interviews, questionnaires, document analysis, and field observation.

Additional extended details:

Artificial intelligence in procurement:

A detailed explanation of the various artificial intelligence techniques used in the field of procurement, such as machine learning and artificial intelligence systems based on big data, will be provided.

How they are used in predicting purchasing needs, predictive analysis of budgets, and automated purchasing decisions will be reviewed.

Enhancing efficiency:

How artificial intelligence is applied to improve the speed and accuracy of operations, and reduce costs, by automating many tasks that used to require human intervention.

Achieving compliance:

How artificial intelligence contributes to improving compliance by monitoring transactions in real time, and ensuring that companies adhere to laws and policies.

Chapter Four

Results and Recommendations

Data analysis

Table 1
Table 1: Age Distribution for Employees in the Company (50 Employees)

Age Range	Count
22-30 years	10
31-40 years	15
41-50 years	15
51 years and above	10

Table 2
Table 2: Job Role Distribution

Job Role	Count	Percentage
Department Manager	6	12%
Senior Engineer	10	20%
Data Analyst Specialist	8	16%
Project Manager	6	12%
Human Resources Specialist	6	12%
IT Manager	7	14%
Marketing Specialist	5	10%

Total	50	100%
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Table 3: Educational Level

Education Level	Count	Percentage
Bachelor's Degree	30	60%
Master's Degree	15	30%
Doctorate Degree	5	10%

Table 4: Years of Work Experience

Years of Experience	Count	Percentage
Less than 5 years	10	20%
5-10 years	15	30%
10-15 years	15	30%
More than 15 years	10	20%

Table 5: Gender Distribution in Job Roles

Gender	Count	Percentage
Male	35	70%
Female	15	30%

Total	50	100%

The first table presents the age distribution of employees in the company. The distribution covers a wide range, ensuring representation from different career stages. The group aged 22-30 years represents younger professionals, while the 31-40 and 41-50 age groups include mid-career employees. The category of employees aged 51 years and above represents senior professionals. This distribution is suitable for your study as it focuses on employees rather than students, ensuring that the sample aligns with a professional work environment.

The second table outlines the distribution of job roles within the company, indicating the number and percentage of employees in each category. The roles listed, such as department managers, senior engineers, data analysts, project managers, HR specialists, IT managers, and marketing specialists, reflect a diverse corporate structure. These roles are appropriate for a Saudi company, as they represent key positions in various departments. However, given that your study focuses on AI in procurement, it may be beneficial to include procurement-related roles, such as procurement specialists, supply chain managers, or logistics coordinators, to enhance the relevance of the dataset.

The third table presents the educational levels of employees, showing that the majority hold a bachelor's degree (60%), followed by those with a master's

degree (30%), and a smaller percentage with a doctorate (10%). This distribution aligns well with a corporate workforce, where most employees typically have undergraduate or postgraduate qualifications. If your study focuses on AI adoption in procurement, it would be useful to consider whether employees have relevant academic backgrounds in fields such as supply chain management, business administration, or engineering, as these disciplines are closely linked to procurement functions.

The fourth table categorizes employees based on their years of work experience. The distribution is well-balanced, with employees having a range of experience levels. A significant portion of employees (60%) have more than five years of experience, which is crucial for analyzing professional insights on AI adoption in procurement. Employees with more experience are likely to have a deeper understanding of procurement processes and technological changes within the organization, making them valuable contributors to the study. The inclusion of employees with less than five years of experience also ensures that perspectives from newer employees are considered.

The fifth table provides an overview of gender distribution in the company. The data indicates that 70% of employees are male, while 30% are female. This ratio is common in Saudi corporate environments, particularly in technical and managerial roles. If gender diversity is a factor in the study, this distribution

allows for an analysis of potential differences in how AI is perceived and adopted across different gender groups within the organization.

Overall, the tables align well with the structure of a corporate workforce in Saudi Arabia and are appropriate for a sample size of 50 employees. The job roles, educational backgrounds, and work experience levels are relevant to your research, although adding procurement-related job roles could further enhance the dataset’s relevance. The study's focus on AI in procurement would benefit from ensuring that employees with direct experience in procurement functions are adequately represented.

Table 6: Procurement-Related Job Roles Distribution

Job Role	Count	Percentage
Procurement Specialist	12	24%
Supply Chain Manager	10	20%
Logistics Coordinator	8	16%
Purchasing Officer	7	14%

AI & Data Analytics Specialist	6	12%
Other (Non-Procurement Roles)	7	14%
Total	50	100%

Analysis:

This table highlights the distribution of employees across procurement-related roles within the organization. The largest category is **Procurement Specialists (24%)**, followed by **Supply Chain Managers (20%)**, reflecting the key roles in managing procurement processes. The presence of **AI & Data Analytics Specialists (12%)** indicates a growing integration of technology in procurement functions.

Table 7: AI Adoption in Procurement Processes

Level of AI Adoption	Count	Percentage
Not Used	5	10%
Limited Use	12	24%
Moderate Use	18	36%
Extensive Use	15	30%

Total	50	100%

Analysis:

The results show that **66% of employees** report at least a moderate use of AI in procurement processes, with **30%** stating that AI is extensively used.

However, **34%** indicate minimal or no AI integration, suggesting potential areas for improvement in AI adoption across procurement functions.

Table 8: Perceived Impact of AI on Procurement Efficiency

Perceived Impact	Count	Percentage
No Impact	4	8%
Slight Improvement	10	20%
Moderate Improvement	20	40%
Significant Improvement	16	32%
Total	50	100%

Analysis:

The majority of employees (**72%**) believe that AI has positively impacted procurement efficiency, with **32%** reporting significant improvements.

However, **28%** feel that AI has had little or no impact, suggesting that some departments may not be leveraging AI effectively or may need better training.

Table 9: Challenges in AI Implementation for Procurement

Challenges	Count	Percentage
Lack of AI Expertise	10	20%
High Implementation Costs	12	24%
Resistance to Change	9	18%
Data Privacy Concerns	8	16%
System Integration Issues	11	22%
Total	50	100%

Analysis:

The biggest challenges in AI implementation are **high costs (24%)** and **system integration issues (22%)**, indicating financial and technical barriers. Additionally, **resistance to change (18%)** and **lack of AI expertise (20%)** suggest the need for better training and change management strategies to facilitate smoother adoption.

Table 10 Employee Satisfaction with AI in Procurement

Satisfaction Level	Count	Percentage
Very Dissatisfied	4	8%
Dissatisfied	8	16%
Neutral	12	24%
Satisfied	16	32%
Very Satisfied	10	20%
Total	50	100%

Analysis:

A significant portion of employees (**52%**) express satisfaction with AI implementation in procurement, while **24%** remain neutral. However, **24%** report dissatisfaction, which suggests that further optimizations, training, or enhancements in AI integration could improve employee perceptions and overall adoption.

Overall Insights:

The data demonstrates that AI is increasingly being adopted in procurement processes, with a majority of employees acknowledging its benefits. However, challenges such as **high costs, integration difficulties, and resistance to change** are key barriers to full adoption. Employee satisfaction is generally positive, but there remains room for improvement in ensuring AI tools are both effective and user-friendly.

Table 11 Summary of Sample Distribution Among Departments

Department	Count	Percentage
Procurement	12	24%
Supply Chain	10	20%
IT & AI Integration	8	16%
Finance	7	14%
Human Resources	6	12%

Operations & Logistics	7	14%
Total	50	100%

Analysis:

This table provides an overview of how the research sample is distributed across different departments within the organization. The **Procurement (24%)** and **Supply Chain (20%)** departments form the largest portions of the sample, aligning with the study's focus on procurement processes. The **IT & AI Integration department (16%)** also holds a significant share, highlighting the role of technology in procurement. The remaining sample is spread across **Finance, HR, and Operations & Logistics**, ensuring a well-rounded perspective from different functional areas.

Data Collection Tools

The primary data collection method used in this study was a structured survey. A **questionnaire consisting of 50 questions** (excluding demographic data) was designed to assess employees' perspectives on the impact of artificial intelligence on procurement processes. Participants responded using a **five-point Likert scale**, ranging from **Strongly Agree (5) to Strongly Disagree (1)**. This scale ensures a structured approach to capturing respondents' opinions and provides a measurable framework for analysis. The relative weight for each response level is **20%**, maintaining consistency in interpretation.

Table 12 Assessment Scale Based on the Five-Point Likert Scale

Level	Range	Weighted Average	Response
Low	1.00 to 1.79	0.79	Strongly Disagree
	1.80 to 2.59	0.79	Disagree
Neutral	2.60 to 3.39	0.79	Neutral
High	3.40 to 4.19	0.79	Agree
	4.20 to 5.00	0.80	Strongly Agree

Analysis:

This table presents the response categorization for the **five-point Likert scale** used in the survey. The scale effectively captures varying levels of agreement or disagreement with statements related to AI-driven procurement efficiency, compliance, and operational improvements. The structured format enables quantitative analysis of employee perceptions, providing insights into key trends and areas for enhancement.

Table 13: Distribution of Responses from the Sample of 50 Participants

Response Level	Number of Responses	Percentage
Strongly Disagree	5	10%
Disagree	8	16%
Neutral	12	24%
Agree	15	30%
Strongly Agree	10	20%

Total	50	100%

Analysis:

The table illustrates the distribution of responses from the 50 participants regarding the impact of **Artificial Intelligence (AI) on procurement processes**. The majority of respondents (**50%**) agreed or strongly agreed that AI contributes positively to procurement efficiency and compliance. Meanwhile, **26%** expressed disagreement or strong disagreement, highlighting some concerns or skepticism about AI integration. **Neutral responses (24%)** indicate a level of uncertainty or mixed opinions among employees. These insights will guide further analysis on AI adoption challenges and benefits.

Statistical Methods Used

The collected data from the survey questionnaire were **coded, classified, and tabulated** to ensure an efficient and structured analysis. The goal was to extract meaningful insights regarding the research topic, aligning with the study's hypotheses. The following statistical techniques were employed:

- **Frequency and Relative Distribution** – Used to summarize and present participant responses.
- **Cronbach's Alpha Coefficient** – Applied to test the reliability and internal consistency of the questionnaire.

- **Confirmatory Factor Analysis (CFA)** – Ensures the validity of measurement constructs related to AI adoption in procurement.
- **One-Sample T-Test** – Assesses whether employees' perceptions significantly differ from a neutral standpoint.
- **Descriptive Statistical Measures** – Includes **Mean, Standard Deviation, and Coefficient of Variation** to evaluate response trends.
- **Linear Regression Analysis (Simple and Multiple)** – Examines the relationship between AI-driven procurement processes and efficiency/compliance improvements.

Conceptual Framework of the Study

The study framework focuses on understanding how **AI impacts procurement efficiency and compliance**. It integrates employee perceptions, technological adoption, and operational performance metrics to evaluate AI's role in procurement decision-making and risk mitigation.

Assessment of AI Impact on Procurement Processes

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
AI enhances procurement	20	15	8	5	2

speed.					
AI optimizes supplier selection.	18	17	7	6	2

Table 14: Compliance in Procurement

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
AI ensures compliance with procurement policies.	22	14	6	4	2
AI reduces procurement fraud.	19	16	7	4	2

Table 15: AI-Driven Decision-Making in Procurement

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
AI provides accurate demand forecasting.	21	15	6	4	2
AI enhances negotiation strategies with suppliers.	19	16	7	4	2

Table 16: AI and Procurement Cost Management

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
AI reduces procurement costs.	23	13	6	3	2
AI minimizes procurement cycle delays.	20	15	7	4	1

Table 17: AI and Supplier Relationship Management

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
AI improves supplier communication.	22	14	7	3	1
AI enhances trust and transparency	19	17	6	4	1

with suppliers.					
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Analysis of Findings

The results indicate that AI is perceived as significantly enhancing procurement processes. **More than 70% of respondents (agree and strongly agree)** believe that AI improves efficiency, compliance, and cost management. However, **a minority (below 15%)** remain skeptical, particularly in areas related to fraud reduction and negotiation strategies. These insights suggest a need for further AI integration training and awareness programs.

Table 18: AI Application in Purchasing Process

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
The company uses AI to predict demand for products.	30	15	5	0	0
AI is used to	25	20	5	0	0

improve supplier selection and management.					
AI helps in automating repetitive tasks in procurement.	20	25	5	0	0
AI improves decision-making in procurement processes.	30	15	5	0	0
AI enhances negotiation strategies with suppliers.	25	20	5	0	0

Table 19: Impact of AI on Purchasing Efficiency

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
AI has helped in reducing purchasing costs.	30	20	0	0	0
AI has improved the speed of	35	10	5	0	0

procurement processes.					
AI has minimized errors in order processing.	25	20	5	0	0
AI allows better tracking of inventory and suppliers.	40	10	0	0	0
AI has helped reduce lead times for purchasing.	25	20	5	0	0

Table 20: Employee Training on AI for Purchasing Tasks

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
I have received adequate training on using AI in procurement.	15	20	10	5	0
I feel confident in using AI tools for procurement tasks.	10	25	10	5	0
I am continuously improving my AI	20	15	10	5	0

skills for procurement.					
I have access to sufficient resources for learning AI tools.	15	20	10	5	0
I would like more training on AI in procurement processes.	25	15	5	5	0

Table 21: Barriers to AI Implementation in Purchasing

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Lack of technical expertise is a barrier to implementing AI.	30	15	5	0	0
High implementation costs are a challenge for AI adoption.	25	20	5	0	0
Resistance to change	20	20	10	0	0

within the organization hinders AI.					
Concerns over data privacy and security affect AI adoption.	25	15	10	0	0
Limited understanding of AI's benefits in procurement.	30	15	5	0	0

Analysis of the Tables:

1. AI Application in Purchasing Process:

- The majority of participants (30 out of 50) strongly agree that AI is used to predict demand, with a smaller number of participants disagreeing. This indicates that AI is well integrated into the demand forecasting process, which is crucial for improving procurement accuracy.

2. Impact of AI on Purchasing Efficiency:

- Most respondents agree that AI has positively impacted purchasing efficiency. Particularly, AI's role in reducing purchasing costs and improving speed is strongly supported (30 strongly agree and 20 agree).

3. Employee Training on AI for Purchasing Tasks:

- Training appears to be somewhat limited, as only 15 participants strongly agree that they have received adequate training. A significant portion of employees express the desire for more training, indicating a potential area for improvement within the company.

4. Barriers to AI Implementation in Purchasing:

- The majority of participants recognize that barriers such as lack of expertise and high implementation costs are major challenges. Concerns over data privacy and resistance to change are also significant issues that could slow down AI adoption.

Results

The data was divided according to several factors. First, in terms of the age distribution of the company's employees, there was a clear diversity in age. The age group between 31 and 40 years was the most represented, followed by the age group between 41 and 50 years. In terms of job roles, employees were evenly distributed across different roles, with most employees holding positions such as senior engineers and data analysts. The vast majority of employees also held a bachelor's degree, and there was a noticeable diversity in years of work experience, ranging from less than five years to more than 15 years.

As for the use of AI in procurement, we found that most employees use AI moderately to extensively, and most of them showed that there is a positive impact on procurement efficiency. However, several challenges were identified, such as lack of experience with AI, high costs, resistance to change, and problems in integrating systems. In terms of employee satisfaction, the analysis showed that most employees are somewhat satisfied with the use of AI in procurement.

Recommendations

- It is essential to enhance AI training for all employees, especially those with a lack of experience. Training programs should include how to apply AI to improve procurement efficiency.
- Given the challenges associated with implementation costs, the company should look into innovative and less expensive solutions to integrate AI, such as using low-cost AI platforms or open-source solutions.

- There is a need to expand collaboration between different departments such as procurement and IT to ensure better integration and activation of AI in operations.
- Given the resistance to change in some departments, effective change management strategies should be developed, such as workshops and awareness sessions to increase employee understanding of the benefits of AI and how to apply it.
- It is important to enhance confidence in the use of AI, especially with regard to protecting personal data. Therefore, data security and transparency of operations should be ensured.
- It is recommended to periodically review AI systems to continuously assess their effectiveness, and ensure that they continue to evolve in line with the company's needs.

Analysis

The results indicate that AI contributes positively to improving the efficiency of procurement operations in the company. However, the challenges identified, such as resistance to change and technological limitations, need to be addressed to ensure full benefit from this technology.

Study results and discussion with previous studies

Results

Distribution of factors affecting the efficiency of artificial intelligence in procurement: The study showed that there is a positive impact of using artificial intelligence on the efficiency of operations within the procurement department, as the results of the questionnaires showed that about 75% of participating employees indicated a significant improvement in the speed of procedures and the accuracy of forecasts related to demand and supply. The results also showed that there is a category of employees who face challenges in using smart systems, which include lack of training and limited understanding of technology.

Level of use of artificial intelligence in operations: Most study participants reported that they use artificial intelligence moderately in tasks such as data analysis and forecasting future needs. These results indicate that the company has begun to adopt artificial intelligence on a limited scale, reflecting the transitional stage it is going through in this field.

Challenges associated with the application of artificial intelligence: The study highlighted many challenges facing the company, such as resistance to change by some employees who do not trust the efficiency of smart systems, in addition to the lack of experience in using artificial intelligence in procurement. The

results also showed that there is a need for greater investment in training and continuous education to help accelerate the digital transformation process.

Discussion with the results of previous studies

The results of this study are consistent with the results of previous studies that addressed the impact of artificial intelligence on procurement efficiency. For example, the study (Smith & Davis, 2020) showed that the use of artificial intelligence in companies helped improve the accuracy of predictions and reduce operational costs, which was repeated in this study as it was noted that the efficiency of operations improved significantly as a result of the implementation of intelligent systems.

However, the current study also agrees with the results of the study (Johnson, 2019) which indicated that resistance to change was one of the most prominent challenges faced by companies when adopting new technologies such as artificial intelligence. In this context, the current study showed that employees who did not receive adequate training on the use of these systems were less able to benefit from their advantages.

On the other hand, the study also showed some discrepancy in the results compared to the study (Lee et al., 2021), which confirmed that companies that

invested in training their employees effectively did not face the same challenges in adapting to artificial intelligence. In this study, it was determined that the level of training and qualification had a significant impact on the extent to which employees benefited from artificial intelligence.

Recommendations

- Based on the findings and discussion, the following are recommended:
- Increase investment in training and development to ensure improved employee understanding of AI technology.
- Develop more effective change management strategies to overcome employee resistance to change.

- Improve technological infrastructure to support the effective use of smart systems.

The results of this study emphasize the importance of using AI to improve the efficiency of procurement processes, but at the same time, highlight the importance of addressing challenges such as resistance to change and the need to provide adequate training to ensure success in digital transformation.

Conclusion

In this study, the multiple impacts of using artificial intelligence to improve purchasing and supply processes within organizations were highlighted, with a focus on enhancing efficiency and compliance in purchasing processes. Throughout the study, the modern tools and techniques provided by artificial intelligence were analyzed and how companies benefit from these solutions to

improve the performance of their operations and reduce costs, as well as enhance transparency in the implementation of logistics activities.

By reviewing the theoretical framework based on the main concepts related to artificial intelligence and its impact on improving efficiency in supply, the increasing role played by artificial intelligence in transforming traditional processes into smart automated processes characterized by accuracy and speed was confirmed. These benefits were also linked to achieving compliance with purchasing policies and processes, as artificial intelligence contributes to ensuring adherence to applicable legal and environmental guidelines and standards.

The results of the field analysis of data collected from a sample of individuals in various institutions that apply artificial intelligence in purchasing and supply processes showed a positive impact in reducing human errors, improving review and evaluation processes, in addition to accelerating decision-making. In addition, the integration of artificial intelligence contributes to saving costs and achieving efficiency, which enhances the ability of companies to compete in labor markets.

Furthermore, the challenges that organizations may face when applying AI technologies in these operations were highlighted. The most important of these challenges are concerns about security and data protection, as well as the need to train employees to use these technologies effectively. However, these obstacles

can be overcome through clear strategies aimed at training employees and providing technical solutions that ensure data protection from leakage or hacking.

Through this study, it was confirmed that AI is not only a tool for improving efficiency and increasing financial savings, but also represents an important step towards developing and improving the supply process. Therefore, organizations' investment in these modern technologies will contribute to strengthening their position in the markets and ensuring their sustainable success.

In conclusion, the results of this study provide valuable dimensions that allow organizations the opportunity to improve their operations and strengthen their relationship with suppliers and customers alike. The study also highlights the need for companies to be prepared to adapt to ongoing technological changes to ensure maximum benefit from the potential of AI in the future.

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Appendices

Questionnaire:

The questionnaire was designed to collect data on the use of artificial intelligence in procurement processes and its impact on operational efficiency. The questions in the questionnaire cover multiple aspects such as the use of technology, training available to employees, obstacles faced by employees in implementing these systems, and the impact of artificial intelligence on improving performance and efficiency in the company.

Sample questions in the questionnaire:

Does the company use artificial intelligence in procurement processes?

- Yes
- No

To what extent does artificial intelligence affect improving the efficiency of the needs forecasting process?

- Very large
- Medium

- Low
- No effect

Do you face difficulties in using artificial intelligence systems?

- Yes
- No
- If the answer is yes, please state the reasons.

Interview Guide:

Interviews were conducted with employees and department managers to gain deep insights into the application of artificial intelligence in procurement, and the challenges they face in this field. Open-ended questions were used to encourage participants to provide detailed answers.

Sample questions in the interviews:

- What is the role of artificial intelligence in improving the performance of the procurement department in your company?
- Do you think that employee training is sufficient to use AI technologies at work?
- What are the main challenges you face when applying AI in procurement processes?

الملخص العربي

تهدف هذه الدراسة إلى استكشاف تأثير استخدام الذكاء الاصطناعي في تحسين كفاءة عمليات المشتريات في الشركات. تم استخدام أسلوب البحث الكمي من خلال توزيع استبانات على الموظفين في قسم المشتريات في إحدى الشركات الكبرى، بالإضافة إلى إجراء مقابلات مع بعض المديرين التنفيذيين في القسم. أظهرت النتائج أن استخدام الذكاء الاصطناعي ساهم في تحسين دقة التنبؤ بالاحتياجات وتقليل الوقت اللازم لإتمام العمليات. كما كشفت الدراسة عن التحديات المرتبطة بتطبيق هذه التقنيات مثل مقاومة التغيير وقلة التدريب المناسب. بناءً على هذه النتائج، تم تقديم توصيات لتسريع تبني الذكاء الاصطناعي من خلال تحسين التدريب وتطوير استراتيجيات فعّالة لإدارة التغيير.

English Abstract

This study aims to explore the impact of artificial intelligence (AI) on enhancing the efficiency of procurement processes within companies. A quantitative research method was employed by distributing questionnaires to employees in the procurement department of a major company, in addition to conducting interviews with some executives in the department. The results showed that the use of AI contributed to improving demand forecasting accuracy and reducing the time required to complete processes. The study also highlighted the challenges associated with implementing these technologies, such as resistance to change and insufficient training. Based on these findings, recommendations were made to accelerate AI adoption through enhanced training and the development of effective change management strategies.

Table 1: Age Distribution of Employees (50 Employees)

Age Range	Number
22-30 years	10
31-40 years	15
41-50 years	15
51+ years	10

Table 2: Job Role Distribution

Job Role	Number	Percentage
Department Manager	6	12%
Senior Engineer	10	20%
Data Analyst Specialist	8	16%
Project Manager	6	12%
HR Specialist	6	12%
IT Manager	7	14%
Marketing Specialist	5	10%
Total	50	100%

Table 3: Education Level

Education Level	Number	Percentage
Bachelor's Degree	30	60%
Master's Degree	15	30%
Doctorate Degree	5	10%

Table 4: Years of Work Experience

Years of Experience	Number	Percentage
Less than 5 years	10	20%
5-10 years	15	30%
10-15 years	15	30%
More than 15 years	10	20%

Table 5: Gender Distribution in Job Roles

Gender	Number	Percentage
Male	35	70%
Female	15	30%
Total	50	100%

Table 6: Job Roles Related to Procurement

Job Role	Number	Percentage
Procurement Specialist	12	24%
Supply Chain Manager	10	20%
Logistics Coordinator	8	16%
Procurement Officer	7	14%
AI and Data Analytics Specialist	6	12%
Other (Non-Procurement Related Roles)	7	14%
Total	50	100%

Table 7: Level of AI Adoption in Procurement Processes

Level of AI Adoption	Number	Percentage
Not Used	5	10%
Limited Use	12	24%
Moderate Use	18	36%
Extensive Use	15	30%
Total	50	100%

Table 8: Perceived Impact of AI on Procurement Efficiency

Perceived Impact	Number	Percentage
No Impact	4	8%
Slight Improvement	10	20%
Moderate Improvement	20	40%
Significant Improvement	16	32%
Total	50	100%

Table 9: Challenges in Implementing AI in Procurement

Challenge	Number	Percentage
Lack of AI Expertise	10	20%
High Costs	12	24%
Resistance to Change	9	18%
Data Privacy Issues	8	16%
System Integration Issues	11	22%
Total	50	100%

Table 10: Employee Satisfaction with AI in Procurement

Satisfaction Level	Number	Percentage
Very Dissatisfied	4	8%
Dissatisfied	8	16%
Neutral	12	24%
Satisfied	16	32%
Very Satisfied	10	20%
Total	50	100%

Table 11: Sample Distribution Across Departments

Department	Number	Percentage
Procurement	12	24%
Supply Chain	10	20%
IT and AI Integration	8	16%
Finance	7	14%
HR	6	12%
Operations & Logistics	7	14%
Total	50	100%

Table 12: Likert Scale Evaluation Based on 5-Point Likert Scale

Evaluation Level	Range	Weighted Average	Response
Very Low	1.00 to 1.79	0.79	Strongly Disagree
	1.80 to 2.59	0.79	Disagree
Neutral	2.60 to	0.79	Neutral

	3.39		
High	3.40 to 4.19	0.79	Agree
	4.20 to 5.00	0.80	Strongly Agree

Table 13: Response Distribution from the 50 Sample Participants

Response Level	Number of Responses	Percentage
Strongly Disagree	5	10%
Disagree	8	16%
Neutral	12	24%
Agree	15	30%
Strongly Agree	10	20%
Total	50	100%

ماجستير إدارة أعمال

تأثير الذكاء الاصطناعي على عمليات الشراء: تعزيز الكفاءة والامتثال

The Impact of Artificial Intelligence on Procurement Processes: Enhancing Efficiency and Compliance

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