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Department/ Specialization



Project title

Analyzing the Role of Large Language Models in
Supporting Business Decision Making: A Case Study of
BAB International Corp.

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Date of submission – number of Semester

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1. Chapter 1: Introduction

1.1. Research Background

The rapid advancement of Artificial Intelligence (AI) has fundamentally transformed how organizations operate, compete, and make strategic decisions. As businesses increasingly rely on digital technologies to improve operational efficiency and maintain competitive advantage, AI has evolved from a supporting technology into a critical component of organizational decision-making processes. Recent developments in machine learning, natural language processing (NLP), and generative AI have enabled organizations to process vast amounts of structured and unstructured data, generate actionable insights, automate routine tasks, and support managers in making faster and more informed decisions (Dwivedi et al., 2023).

Among the most significant innovations in artificial intelligence are Large Language Models (LLMs). These models are advanced AI systems trained on massive datasets capable of understanding, generating, summarizing, translating, and analyzing natural language with remarkable accuracy. Unlike traditional rule-based systems, LLMs learn linguistic patterns and contextual relationships from extensive textual data, enabling them to perform sophisticated reasoning tasks and assist users across a wide range of business functions. The introduction of transformer-based architectures has significantly improved language understanding capabilities, making LLMs practical tools for organizations seeking intelligent decision-support solutions (Brown et al., 2020; Bommasani et al., 2021).

The increasing adoption of LLMs has reshaped the way organizations manage knowledge and make decisions. Modern businesses generate enormous volumes of information through customer interactions, financial transactions, operational reports, market intelligence, and digital communications. Converting this information into meaningful knowledge represents one of the greatest challenges facing managers. LLMs address this challenge by rapidly processing large datasets, extracting relevant information, summarizing complex documents, identifying patterns, generating analytical reports, and supporting evidence-based decision making. Consequently, organizations are beginning to integrate these technologies into strategic planning, customer relationship management, marketing, human resources, financial analysis, and operational management (Davenport & Mittal, 2022).

Business decision making itself has become increasingly complex due to globalization, digital transformation, rapidly changing customer expectations, and

intensified market competition. Managers are expected to make accurate decisions under conditions characterized by uncertainty, information overload, and limited time. Traditional decision-making approaches often depend heavily on human expertise and manual analysis, which may be time-consuming and susceptible to cognitive biases. AI-powered technologies, particularly LLMs, provide opportunities to complement human judgment by delivering timely insights, synthesizing diverse information sources, and facilitating data-driven decision making (Brynjolfsson & McAfee, 2017).

The emergence of generative AI has accelerated the practical application of LLMs across multiple industries. Organizations now utilize these technologies to automate customer service interactions, generate business reports, conduct market analysis, support internal knowledge management, draft professional communications, and assist employees in solving complex business problems. Rather than replacing human decision makers, LLMs function as intelligent assistants that enhance managerial capabilities by providing rapid access to relevant information and alternative perspectives. This collaborative relationship between human expertise and artificial intelligence represents an important shift toward augmented decision making, where AI supports—but does not replace—managerial judgment (Dwivedi et al., 2023).

The strategic importance of AI has also become a national priority in the Kingdom of Saudi Arabia. Through Vision 2030, the Saudi government has emphasized digital transformation, innovation, and the adoption of emerging technologies as key drivers of sustainable economic development. Public and private sector organizations are increasingly investing in AI-enabled solutions to improve organizational performance, enhance customer experiences, and strengthen global competitiveness. National initiatives encourage businesses to adopt advanced AI technologies, including machine learning, automation, and natural language processing, to increase productivity and support knowledge-based economic growth. As a result, Saudi Arabia provides an important context for examining the organizational impact of Large Language Models.

Within this evolving technological landscape, BAB International Corp. represents a valuable case study for investigating the role of LLMs in business decision making. The company is recognized as a Saudi technology provider specializing in digital transformation, customer engagement solutions, conversational AI, enterprise communication platforms, and intelligent automation. Through its

strategic collaboration with Meta as a WhatsApp Business Solution Provider, the company supports organizations in developing advanced digital communication solutions that integrate artificial intelligence to improve customer interactions and business operations. These capabilities position BAB International Corp. as an appropriate organizational setting for exploring how LLM technologies contribute to managerial decision-making processes.

As organizations continue integrating AI into their daily operations, managers require technologies capable of processing increasing amounts of organizational knowledge while maintaining accuracy, efficiency, and responsiveness. LLMs offer significant opportunities by enabling intelligent document analysis, automated report generation, knowledge retrieval, customer sentiment analysis, strategic planning support, and enhanced communication between organizational stakeholders. These applications have the potential to improve both operational and strategic decision making by reducing information-processing time and increasing the availability of relevant knowledge for managers.

Despite these promising developments, the adoption of LLMs within organizations also introduces important challenges. Decision makers must address issues related to data privacy, information security, model accuracy, explainability, ethical AI governance, organizational readiness, employee trust, and regulatory compliance. Furthermore, while LLMs demonstrate exceptional capabilities in language understanding, they may occasionally generate inaccurate or misleading information if not properly supervised. Consequently, organizations must establish governance frameworks that ensure responsible AI implementation while preserving human oversight in critical business decisions.

From an academic perspective, research concerning LLMs remains relatively new compared with broader studies of artificial intelligence and decision support systems. Existing literature has largely concentrated on the technical performance of generative AI models, whereas fewer studies have examined their organizational implications, particularly within business decision-making contexts in developing digital economies such as Saudi Arabia. Furthermore, empirical evidence regarding enterprise adoption of LLMs in Saudi organizations remains limited, creating opportunities for further investigation into how these technologies influence managerial effectiveness, operational performance, and organizational competitiveness.

Accordingly, this research seeks to analyze the role of Large Language Models in supporting business decision making through a case study of BAB International Corp. Specifically, the study examines how LLM technologies contribute to improving decision quality, increasing decision-making speed, supporting strategic planning, and enhancing operational efficiency within the organization. By focusing on a leading Saudi technology company actively engaged in AI-enabled business solutions, this research aims to contribute to both academic knowledge and managerial practice while supporting the broader objectives of digital transformation and innovation within Saudi Arabia.

1.2. Research Problem

The rapid advancement of Artificial Intelligence (AI), particularly Large Language Models (LLMs), has significantly transformed the way organizations process information, manage knowledge, and support decision-making activities. As businesses continue to embrace digital transformation, LLMs have emerged as powerful tools capable of analyzing large volumes of textual information, generating meaningful insights, automating routine tasks, and assisting managers in making timely and informed decisions. These capabilities have encouraged organizations across various industries to integrate LLMs into their operational and strategic processes to improve efficiency, productivity, and competitiveness.

Despite the growing adoption of LLMs in business environments, organizations continue to face uncertainty regarding their effective implementation and their actual contribution to managerial decision making. While LLMs demonstrate remarkable capabilities in information retrieval, data summarization, predictive analysis, and natural language interaction, their organizational value depends on how effectively they are integrated into existing business processes and decision-support systems. Many organizations have adopted AI technologies

without fully understanding their impact on decision quality, strategic planning, operational efficiency, and managerial performance.

Furthermore, business decision making has become increasingly complex due to rapidly changing market conditions, technological disruption, increasing customer expectations, and the continuous growth of organizational data. Managers are expected to make accurate decisions under significant time pressure while processing vast amounts of information from multiple sources. Traditional decision-making methods often struggle to cope with this information overload, creating opportunities for intelligent technologies such as LLMs to support evidence-based decision making. However, despite their growing popularity, empirical evidence regarding the organizational effectiveness of LLMs remains limited, particularly within business environments in Saudi Arabia.

BAB International Corp. operates within a highly technology-driven environment that emphasizes digital transformation, conversational AI, enterprise communication, and intelligent customer engagement solutions. As organizations like BAB International Corp. increasingly incorporate AI-powered technologies into their business operations, understanding how LLMs contribute to managerial decision making becomes an important research issue. Although the company actively delivers AI-enabled business solutions, limited academic research has examined how LLM technologies support internal business decision making within such organizations. This lack of empirical investigation creates uncertainty regarding the extent to which LLMs improve managerial performance, accelerate decision-making processes, and enhance organizational effectiveness.

Therefore, this research seeks to investigate the role of Large Language Models in supporting business decision making through a case study of BAB International

Corp. The study aims to evaluate whether LLMs contribute to better decision quality, faster decision-making processes, improved operational efficiency, and enhanced strategic planning while also identifying the challenges associated with their organizational implementation.

1.2.1. Theoretical Gaps

Although artificial intelligence has been extensively discussed within the fields of information systems, management, and business analytics, research specifically focusing on Large Language Models remains relatively limited because these technologies have only recently become widely accessible for enterprise applications. Much of the existing literature concentrates on the technical architecture, language capabilities, training methods, and performance evaluation of LLMs rather than examining their influence on organizational decision-making processes.

In addition, previous studies frequently investigate artificial intelligence as a broad concept without distinguishing between traditional AI techniques and modern generative AI technologies such as LLMs. As a result, there is insufficient theoretical understanding of the unique characteristics of LLMs and how these capabilities influence managerial decision making in organizational settings.

Another important theoretical gap concerns the limited integration of LLM research with established business management theories. While frameworks such as Decision Support Systems (DSS), the Technology Acceptance Model (TAM), and the Resource-Based View (RBV) have been widely applied in studies of information technology adoption, relatively few studies have examined how these

theories explain the adoption and effectiveness of LLMs in supporting business decision making. Consequently, there remains an opportunity to extend existing theoretical knowledge by investigating the relationship between LLM adoption and business decision-making performance.

Furthermore, empirical studies examining the impact of LLMs within organizations located in developing digital economies remain scarce. Most published research has focused on organizations operating in North America, Europe, or East Asia, while limited evidence exists regarding enterprise adoption of LLMs within Saudi Arabia and the broader Middle East. Considering Saudi Arabia's significant investment in artificial intelligence and digital transformation initiatives, this geographical research gap warrants further investigation.

Therefore, this study contributes to the existing literature by examining the relationship between Large Language Models and business decision making within the context of a Saudi technology company. The research extends current knowledge by providing empirical evidence regarding organizational applications of LLMs rather than focusing solely on their technical capabilities.

1.2.2. Practical Gaps

From a practical perspective, organizations are increasingly investing in AI-powered technologies to improve productivity, customer engagement, operational efficiency, and decision-making capabilities. However, many organizations continue to experience challenges in translating the technical capabilities of LLMs into measurable business value. Managers often lack practical guidance regarding the most effective methods for integrating LLMs into

organizational decision-making processes while maintaining governance, security, transparency, and accountability.

One practical challenge involves determining the appropriate role of LLMs within managerial decision making. While these technologies can rapidly process information and generate recommendations, organizations must establish clear policies regarding human oversight, ethical AI usage, data privacy, and risk management. Without appropriate governance mechanisms, organizations may become vulnerable to inaccurate outputs, biased recommendations, or overreliance on automated systems.

Another practical gap concerns the limited availability of case studies documenting successful organizational implementation of LLMs within Saudi businesses.

Although many organizations are experimenting with generative AI technologies, relatively little empirical evidence is available to demonstrate how these systems influence decision quality, operational performance, or strategic planning in real organizational settings. Consequently, business leaders have limited evidence upon which to base investment and implementation decisions.

Within BAB International Corp., understanding how LLM technologies support business decision making is particularly relevant because the organization operates within a technology-intensive environment that continuously develops AI-enabled business solutions. Evaluating the practical impact of LLMs can provide valuable insights regarding organizational readiness, implementation strategies, employee adoption, and managerial effectiveness. Such findings may also assist other Saudi organizations seeking to implement similar AI technologies as part of their digital transformation initiatives.

Accordingly, this research addresses an important practical need by examining the organizational application of Large Language Models within BAB International Corp. The findings are expected to provide evidence-based recommendations that support managers in effectively utilizing LLMs to improve decision quality, accelerate business processes, strengthen strategic planning, and enhance overall organizational performance.

1.3. Research Significance

The rapid evolution of Artificial Intelligence (AI), particularly Large Language Models (LLMs), has created new opportunities for organizations to improve operational performance and support managerial decision making. As businesses increasingly adopt AI-powered technologies, understanding how LLMs contribute to organizational effectiveness has become an important area of academic and practical interest. This study seeks to examine the role of LLMs in supporting business decision making through a case study of BAB International Corp. The significance of this research lies in its potential to contribute to both academic knowledge and organizational practice by providing a deeper understanding of the relationship between LLM adoption and business decision-making performance.

1.3.1. At the theoretical level

From a theoretical perspective, this research contributes to the growing body of literature on Artificial Intelligence, Large Language Models, and business decision making. Although numerous studies have investigated artificial intelligence in general, research specifically examining the role of LLMs in organizational decision-making processes remains relatively limited. As LLMs represent a recent

advancement in generative AI, there is still a need for empirical studies that explore their practical applications within business organizations.

This study extends existing knowledge by examining how LLMs influence important dimensions of business decision making, including decision quality, decision-making speed, operational efficiency, and strategic planning. By focusing specifically on LLMs rather than artificial intelligence as a broad concept, the research provides a more focused understanding of how modern generative AI technologies contribute to organizational performance.

Furthermore, this study contributes to the integration of information technology and management theories by examining the relationship between LLM adoption and managerial decision making within an organizational context. The findings may provide empirical support for theoretical frameworks related to decision support systems, technology adoption, and organizational innovation while offering valuable insights for future researchers interested in AI-enabled business management.

Additionally, the research contributes to the limited body of literature concerning the adoption of Large Language Models within Saudi Arabian organizations. Since most existing empirical studies have focused on organizations in developed economies, this research provides evidence from a rapidly developing digital economy that is actively investing in artificial intelligence and digital transformation initiatives. Consequently, the study enriches the regional literature and creates opportunities for future comparative studies involving organizations across the Middle East and other emerging markets.

1.3.2. At the practical level

From a practical perspective, the findings of this study are expected to provide valuable insights for business organizations seeking to integrate Large Language Models into their decision-making processes. As organizations continue investing in AI technologies, managers require a better understanding of how these tools can be effectively utilized to improve decision quality, reduce response time, enhance operational efficiency, and strengthen strategic planning. This research provides evidence that can support managerial decision making regarding AI adoption, implementation strategies, and organizational readiness.

For BAB International Corp., the study offers practical value by evaluating how LLM technologies support internal business decision making and organizational performance. The findings may assist the company's management in identifying opportunities to optimize AI implementation, improve knowledge management, enhance communication processes, and increase operational effectiveness. The recommendations generated from this research may also support future AI initiatives undertaken by the organization.

The study is also expected to benefit other Saudi organizations undergoing digital transformation. Companies operating in sectors such as technology, telecommunications, finance, healthcare, retail, and government services may use the findings to better understand the organizational benefits and challenges associated with implementing Large Language Models. By providing practical evidence from a Saudi case study, the research may encourage organizations to adopt AI solutions more effectively while maintaining appropriate governance, ethical standards, and human oversight.

Furthermore, the findings may assist policymakers, business consultants, and technology professionals in developing strategies that promote responsible AI adoption within Saudi Arabia. As the Kingdom continues implementing the objectives of Vision 2030, understanding the practical implications of LLM technologies can support national efforts to strengthen innovation, improve organizational competitiveness, and accelerate digital transformation across both public and private sectors.

Finally, this research may serve as a useful reference for future undergraduate and postgraduate researchers interested in Artificial Intelligence, business analytics,

digital transformation, and decision support systems. By addressing an emerging research area, the study provides a foundation for further empirical investigations into the organizational applications of Large Language Models across different industries and business environments.

1.4. Research Questions

The primary purpose of this study is to analyze the role of Large Language Models (LLMs) in supporting business decision making within BAB International Corp. To achieve this purpose, the following research questions have been formulated.

Main Research Question

How do Large Language Models support business decision making at BAB International Corp.?

Sub-Research Questions

1. What role do Large Language Models play in supporting business decision making at BAB International Corp.?
2. How do Large Language Models influence the quality of business decisions?
3. To what extent do Large Language Models improve the speed of business decision making?
4. How do Large Language Models contribute to operational efficiency and strategic planning within the organization?
5. What challenges are associated with implementing Large Language Models in business decision-making processes?

1.5. Research Objectives

The objectives of this research are designed to analyze and understand the role of Large Language Models (LLMs) in supporting business decision making within BAB International Corp.

General Objective: To analyze the role of Large Language Models in supporting business decision making through a case study of BAB International Corp.

Specific Objectives:

1. To examine the capabilities and applications of Large Language Models within business environments.
2. To analyze how Large Language Models support information processing and knowledge management in organizational decision-making processes.
3. To explore how LLM-based technologies contribute to improving business decision support, operational efficiency, and strategic planning.
4. To identify potential challenges and limitations associated with the implementation of Large Language Models in business decision-making contexts.
5. To provide insights and recommendations regarding the effective utilization of LLM technologies within organizations undergoing digital transformation.

1.6. Research Hypotheses

Due to the qualitative case study approach adopted in this research, the hypotheses are developed to guide the analysis of the relationship between Large Language Models and business decision making within BAB International Corp.

The study is guided by the following hypotheses:

H1: Large Language Models support business decision making by improving information processing capabilities and enabling organizations to extract meaningful insights from large amounts of data.

H2: The integration of Large Language Models into business processes enhances decision support by improving knowledge accessibility, analysis capabilities, and managerial efficiency.

H3: The effective utilization of Large Language Models in organizations depends on factors such as technological readiness, governance mechanisms, data management practices, and human oversight.

H4: Organizations operating in AI-driven environments can leverage different LLM-based solutions according to specific business use cases, operational requirements, and strategic objectives.

1.7. Research Model

The conceptual model illustrates the relationship explored in this research between Large Language Models and business decision making.

The model proposes that LLM capabilities may contribute to enhanced business decision-making processes through several mechanisms:

Independent Concept

Large Language Models (LLMs) Dimensions:

- Information Processing
- Knowledge Generation
- Natural Language Understanding
- Predictive Analysis
- Task Automation

Dependent Concept

Business Decision Making Dimensions:

- Decision Support
- Decision Quality
- Operational Efficiency
- Strategic Planning

The model serves as a conceptual framework for analyzing how organizations utilize LLM capabilities to support decision-making activities.

1.8. Research Methodology

This study adopts a qualitative research approach to analyze the role of Large Language Models in supporting business decision making at BAB International Corp. A qualitative approach is appropriate because the research aims to develop an in-depth understanding of how organizations utilize AI-enabled technologies and how these technologies contribute to decision-making processes.

The research follows a case study design, with BAB International Corp. selected as the case organization due to its involvement in digital transformation, AI-enabled business solutions, enterprise communication technologies, and intelligent automation services.

Data will be collected through secondary sources, including academic literature, company publications, official digital resources, industry reports, technology-related documentation, and publicly available information related to AI adoption and business applications.

The collected information will be analyzed using thematic analysis to identify key patterns related to the role of Large Language Models in business decision making. The analysis will focus on areas such as information processing, knowledge management, automation, decision support, operational improvement, and strategic decision enhancement.

This methodology enables the research to examine the practical role of LLM technologies within a real business context while avoiding dependence on employee participation or confidential internal organizational data.

1.9. Scope of The Study

The scope of this research is defined as follows:

Subject Scope

The study focuses on analyzing the role of Large Language Models in supporting business decision making.

Organizational Scope

The research is conducted as a case study of BAB International Corp.

Geographical Scope

The study is limited to the Kingdom of Saudi Arabia.

Time Scope

The research is conducted during the 2026 academic year.

Human Scope

The study analyzes publicly available organizational and academic information related to AI adoption and business decision-making practices.

1.10. The Suggested Project Structure

The proposed graduation project consists of two chapters.

Chapter One: Introduction

This chapter introduces the research topic, presents the research background, identifies the research problem and gaps, explains the significance of the study, defines the research questions and objectives, presents the conceptual framework, and explains the research methodology and scope.

Chapter Two: Literature Review

This chapter reviews existing academic literature related to Artificial Intelligence, Large Language Models, business decision making, AI-enabled decision support, previous studies, and theoretical perspectives. The chapter identifies existing research gaps and establishes the foundation for analyzing the case of BAB International Corp.

2.Chapter 2: Literature Review

2.1. Introduction

The rapid development of Artificial Intelligence (AI) technologies has significantly influenced the way organizations operate, manage information, and make business decisions. In recent years, the emergence of Generative Artificial Intelligence and Large Language Models (LLMs) has introduced new possibilities for organizations seeking to improve knowledge management, automate business processes, and enhance decision-making capabilities. Unlike traditional information systems that mainly rely on predefined rules and structured data, LLM-based technologies can analyze complex information, understand natural language, generate responses, and assist users in solving business-related problems.

This chapter presents a critical review of the existing literature related to the two main concepts of this research: Large Language Models as the independent concept and Business Decision Making as the dependent concept. The purpose of this literature review is to examine previous academic studies, identify major findings, evaluate existing perspectives, and determine the research gaps that justify investigating the role of LLMs within an organizational context.

The first part of this chapter focuses on Large Language Models, including their development, characteristics, capabilities, applications, and challenges. Previous studies regarding generative AI highlight that LLMs represent a significant advancement in information processing because they can transform unstructured data into meaningful knowledge and support complex cognitive tasks. However, despite their increasing adoption, researchers continue to debate issues related to reliability, governance, ethical implementation, and organizational readiness.

The second part examines business decision making as a fundamental organizational process. Effective decision making depends on the availability, quality, and interpretation of information. Traditional decision-making approaches often require significant human effort to collect, analyze, and evaluate information, creating opportunities for AI-enabled systems to support managers by improving access to relevant knowledge and reducing information-processing limitations.

The final part of the chapter analyzes the relationship between Large Language Models and business decision making. Existing literature suggests that LLMs have the potential to enhance decision support through improved information retrieval,

knowledge generation, automation, and analytical assistance. However, the extent to which organizations successfully integrate these technologies depends on various factors, including technological capabilities, organizational readiness, governance frameworks, and human oversight.

By reviewing previous research, this chapter establishes the theoretical foundation for analyzing the role of Large Language Models in supporting business decision making. It also highlights the limited availability of empirical studies examining LLM adoption within Saudi organizations, providing justification for the current case study of BAB International Corp.

2.2. The independent variable

Artificial Intelligence and the Evolution Toward Large Language Models

Artificial Intelligence (AI) has evolved significantly over the past decades, progressing from traditional rule-based systems to advanced learning-based technologies capable of performing complex cognitive tasks. Early AI applications were primarily dependent on predefined instructions and limited datasets, which restricted their ability to adapt to changing environments. However, advancements in machine learning and deep learning have enabled AI systems to identify patterns, learn from data, and perform tasks with increasing levels of accuracy and autonomy.

One of the most important developments in modern AI is the emergence of Generative Artificial Intelligence, which refers to systems capable of creating new content, including text, images, audio, and software code. Unlike traditional AI systems that mainly classify or predict existing information, generative AI can produce human-like outputs based on learned patterns from large datasets. This development has created significant opportunities for organizations seeking to improve productivity, automate knowledge-intensive tasks, and enhance decision-support capabilities.

Large Language Models represent one of the most influential advancements within generative AI. These models are designed to process and generate human language by learning relationships between words, concepts, and contextual information from extensive training datasets. The introduction of transformer-based

architectures significantly improved the ability of AI systems to understand complex language structures and perform multiple tasks without requiring separate models for each application (Vaswani et al., 2017).

The development of models such as GPT-based systems, BERT, and other foundation models has accelerated the adoption of LLM technologies across different industries. These models demonstrate the ability to summarize information, answer questions, analyze documents, generate content, and assist users in knowledge-intensive activities. Consequently, LLMs have moved beyond research environments and become increasingly relevant for organizational applications.

Definition and Characteristics of Large Language Models

Large Language Models can be defined as advanced artificial intelligence systems trained on extensive collections of textual data to understand, generate, and manipulate natural language. Unlike traditional software systems that operate according to explicit programming rules, LLMs identify patterns and relationships within language data, allowing them to generate responses based on contextual understanding.

According to Bommasani et al. (2021), foundation models represent a new paradigm in AI because a single model can be adapted to perform multiple tasks across different domains. This characteristic distinguishes LLMs from traditional AI solutions that are typically developed for specific purposes. The ability of LLMs to perform diverse tasks makes them particularly valuable for organizations seeking flexible and scalable AI solutions.

Several characteristics make LLMs relevant to business environments:

1. Natural Language Understanding

LLMs can interpret and process human language, enabling users to interact with AI systems using normal communication rather than technical programming languages. This capability reduces barriers to AI adoption and allows employees across different organizational functions to utilize AI tools.

2. Knowledge Processing Capability

LLMs can analyze large amounts of information, identify relevant patterns, summarize complex documents, and support knowledge management activities. This capability is particularly important for organizations dealing with significant amounts of unstructured information.

3. Content Generation

LLMs can generate reports, summaries, recommendations, and business communications, reducing the time required for repetitive knowledge-based tasks.

4. Adaptability Across Business Functions

Because LLMs are general-purpose technologies, they can support different organizational areas, including customer service, marketing, operations, human resources, and strategic analysis.

Capabilities of LLMs in Business Environments

The increasing interest in LLM adoption is largely driven by their ability to enhance organizational capabilities. Businesses generate large volumes of information daily through internal documents, customer interactions, market reports, and operational systems. Processing this information efficiently is essential for effective decision making.

One major capability of LLMs is information processing. Organizations can utilize LLM-based systems to analyze large amounts of text, extract important information, identify trends, and transform unstructured data into actionable insights. This capability supports managers by reducing the time required to collect and interpret information.

Another important capability is knowledge management. Organizational knowledge is often distributed across different systems and documents, making it difficult for employees to access relevant information quickly. LLM-based applications can improve knowledge accessibility by allowing users to interact with organizational information through natural language queries.

Furthermore, LLMs contribute to automation by assisting with repetitive tasks such as document creation, customer communication, data summarization, and administrative processes. By reducing manual effort, organizations can allocate

human resources toward more complex activities requiring creativity and strategic judgment.

Research indicates that generative AI technologies may significantly influence knowledge work by increasing employee productivity and supporting complex problem-solving activities (Brynjolfsson et al., 2023). However, researchers also emphasize that the value created by LLMs depends on how effectively organizations integrate these technologies into existing workflows.

Applications of LLMs in Organizations

The adoption of LLMs has expanded across various business functions due to their ability to support both operational and strategic activities.

In customer relationship management, LLMs can support intelligent customer interactions, analyze customer feedback, and improve communication quality. Organizations can utilize conversational AI solutions to provide faster responses and enhance customer experiences.

In marketing, LLMs can assist with content generation, market analysis, customer segmentation, and campaign optimization. These capabilities allow organizations to develop more personalized strategies based on customer information.

In operations management, LLMs can improve workflow efficiency by automating documentation, assisting employees with information retrieval, and supporting process improvement initiatives.

In strategic management, LLMs can assist decision makers by summarizing market information, analyzing business reports, and generating alternative perspectives. However, strategic decisions still require human judgment because AI-generated outputs may contain limitations or inaccuracies.

For technology-focused organizations such as BAB International Corp., LLM applications can support multiple business use cases depending on organizational requirements. The value of these technologies comes from their ability to be adapted according to specific operational needs rather than from a single universal application.

Benefits and Challenges of LLM Adoption

The adoption of Large Language Models provides organizations with several potential benefits. These include improved information accessibility, faster knowledge processing, enhanced employee productivity, and increased automation of business activities. By supporting employees with intelligent assistance, LLMs may improve organizational efficiency and enable faster responses to changing business conditions.

However, the implementation of LLMs also presents several challenges. One major concern is accuracy and reliability. Although LLMs can generate highly convincing responses, they may produce incorrect information, commonly referred to as hallucinations. Therefore, organizations must establish processes for verification and human oversight.

Data privacy and security represent additional challenges, particularly when organizations use AI systems to process sensitive business information. Organizations must ensure that AI adoption complies with relevant regulations and internal governance standards.

Furthermore, successful LLM adoption requires organizational readiness, including employee awareness, technological infrastructure, and clear AI governance policies. Without proper management, organizations may struggle to achieve the expected benefits of LLM technologies.

Overall, existing literature suggests that Large Language Models represent a significant technological opportunity for organizations. However, their effectiveness depends not only on technical capabilities but also on how organizations integrate them into business processes and decision-making practices.

2.3. The dependent variable

Concept of Business Decision Making

Business decision making represents one of the most fundamental activities within organizations because it directly influences performance, competitiveness, resource allocation, and strategic direction. Decision making refers to the process through which individuals or groups identify problems, evaluate available alternatives, and

select actions that achieve organizational objectives. Within business environments, decisions may range from routine operational choices to complex strategic decisions involving uncertainty, risk, and long-term consequences.

Traditional decision-making theories emphasize the importance of rational analysis, where managers collect relevant information, evaluate alternatives, and select the option that provides the greatest expected value. However, modern business environments have become increasingly complex due to globalization, technological disruption, rapidly changing customer behavior, and the continuous growth of available data. As a result, managers often face challenges related to information overload, limited time, and uncertainty.

According to Simon's decision-making framework, organizational decisions involve three main stages: intelligence, design, and choice. The intelligence stage involves identifying problems and collecting information; the design stage focuses on developing and evaluating possible solutions; and the choice stage involves selecting the most appropriate alternative. Modern AI technologies, including LLMs, have the potential to support these stages by improving information processing and providing analytical assistance.

The Role of Information and Knowledge in Business Decisions

Effective decision making depends significantly on the availability, accuracy, and relevance of information. Organizations generate large amounts of data through internal operations, customer interactions, financial activities, and market analysis. However, the existence of data alone does not guarantee better decisions. Organizations must transform data into meaningful knowledge that managers can use to evaluate situations and identify opportunities.

Knowledge management has therefore become an important organizational capability. Businesses that effectively capture, organize, and distribute knowledge are better positioned to respond to market changes and improve decision quality. However, many organizations struggle with accessing relevant knowledge because information is often distributed across multiple systems, documents, and communication channels.

AI-enabled technologies have introduced new approaches to knowledge management by allowing organizations to analyze large volumes of information

more efficiently. LLMs are particularly relevant because they can process unstructured information, summarize complex content, and provide users with easier access to organizational knowledge. This capability may reduce the time managers spend searching for information and allow them to focus more on analysis and strategic thinking.

Decision-Making Processes in Modern Organizations

Modern organizations operate in environments characterized by uncertainty, competition, and rapid technological change. As a result, decision making has evolved from relying solely on managerial experience toward combining human expertise with data-driven insights.

Operational decisions often require speed and efficiency. For example, managers may need to respond quickly to customer issues, optimize workflows, or allocate resources. In these situations, technologies that provide rapid access to relevant information can improve organizational responsiveness.

Strategic decisions, on the other hand, require broader analysis and consideration of long-term consequences. These decisions involve areas such as market expansion, innovation strategies, and organizational transformation. While AI technologies can provide analytical support, strategic decisions still require human judgment, creativity, and understanding of organizational goals.

Recent developments in AI have encouraged the concept of augmented decision making, where technology supports rather than replaces human decision makers. This approach recognizes that AI systems are most valuable when combined with human expertise, allowing organizations to benefit from both computational capabilities and managerial experience.

AI-Enabled Decision Support Systems

Decision Support Systems (DSS) have traditionally been used by organizations to assist managers in analyzing information and making decisions. Early DSS technologies focused mainly on structured data analysis, reporting, and analytical models. However, advances in artificial intelligence have expanded decision support capabilities by enabling systems to process complex information and provide more interactive assistance.

AI-enabled decision support systems can analyze large datasets, identify patterns, generate predictions, and support problem-solving activities. Unlike traditional systems that require users to interact through predefined formats, AI-based systems can provide more flexible and natural interactions.

Large Language Models represent a new development in AI-enabled decision support because they allow users to interact with organizational knowledge through natural language. Managers can ask questions, request summaries, analyze documents, and receive AI-generated insights. This capability has the potential to improve decision-making efficiency by reducing the barriers between information and decision makers.

However, researchers emphasize that AI decision support should be viewed as an enhancement to human decision making rather than a complete replacement. AI systems may lack contextual understanding, organizational awareness, or ethical reasoning required for complex decisions. Therefore, effective decision making requires a balance between AI-generated insights and human evaluation.

Challenges Affecting Business Decision Making

Although organizations increasingly rely on digital technologies, several challenges continue to affect decision-making effectiveness. One major challenge is information overload. Managers often have access to more information than they can effectively process, making it difficult to identify the most relevant insights.

Another challenge is decision complexity. Business decisions frequently involve multiple factors, uncertain outcomes, and competing priorities. While analytical technologies can assist with information processing, they cannot fully replace managerial judgment.

Additionally, organizations must consider issues related to trust and transparency when using AI-supported decisions. Managers may hesitate to rely on AI recommendations if they do not understand how outputs are generated or if the system produces inconsistent results. Therefore, explainability and human oversight remain important requirements for responsible AI adoption.

The increasing use of AI technologies has also created new requirements for organizational capabilities. Businesses need appropriate digital infrastructure,

skilled employees, governance frameworks, and ethical guidelines to ensure that AI contributes positively to decision-making processes.

Summary of Business Decision Making Literature

The literature demonstrates that effective business decision making depends on the ability of organizations to collect, process, interpret, and apply information. As business environments become more complex, traditional approaches alone may not be sufficient to address increasing information demands and decision-making challenges.

AI-enabled technologies, particularly Large Language Models, provide new opportunities to support decision making by improving knowledge accessibility, information processing, and analytical capabilities. However, the effectiveness of these technologies depends on appropriate organizational implementation, governance, and human involvement.

Therefore, understanding the relationship between LLMs and business decision making is essential for organizations seeking to utilize AI technologies as strategic resources.

2.4. The relationship between the independent and the dependent variables

Large Language Models as Decision-Support Technologies

The relationship between Large Language Models (LLMs) and business decision making is based on the ability of these technologies to enhance organizational information processing and knowledge management capabilities. As organizations continue to generate increasing amounts of structured and unstructured information, decision makers face challenges in identifying relevant insights and transforming information into actionable knowledge. LLMs provide new opportunities to address these challenges by enabling organizations to process, summarize, and analyze large volumes of information in a more efficient manner.

Unlike traditional decision-support systems that typically rely on structured databases and predefined analytical models, LLM-based systems can interpret

natural language and interact with users through conversational interfaces. This capability allows managers to access information more easily, ask complex questions, and receive AI-generated summaries or recommendations. Consequently, LLMs can function as intelligent decision-support tools that assist managers throughout different stages of the decision-making process.

Previous research on generative AI suggests that these technologies can enhance knowledge-intensive work by increasing productivity, improving access to information, and supporting complex problem-solving activities (Brynjolfsson et al., 2023). However, the value of LLMs depends on how organizations integrate them into business processes and how effectively managers evaluate AI-generated outputs.

Improving Information Processing and Knowledge Accessibility

One of the strongest relationships between LLMs and business decision making is their ability to improve information processing capabilities. Organizations often possess large amounts of valuable information stored in documents, reports, databases, and communication records. However, extracting useful insights from this information can require significant time and human effort.

LLMs can support this process by analyzing unstructured information, identifying important patterns, and summarizing complex content. This capability reduces the cognitive burden on managers and allows them to focus on interpretation and strategic thinking rather than spending excessive time searching for information.

Furthermore, LLMs contribute to knowledge accessibility by creating more efficient ways for employees and managers to interact with organizational knowledge. Through natural language interfaces, users can retrieve information without requiring advanced technical skills. This democratization of access to information can improve collaboration and support faster decision-making processes.

From an organizational perspective, the ability to transform large amounts of information into accessible knowledge represents a significant competitive advantage. Organizations that effectively utilize LLM-based technologies may improve their ability to respond to changing market conditions and identify new opportunities.

Supporting Decision Quality and Decision-Making Efficiency

Decision quality depends on the availability of accurate information, effective analysis, and consideration of relevant alternatives. LLMs may contribute to improved decision quality by assisting managers in analyzing information from multiple sources and generating alternative perspectives.

For example, managers can use LLM-based systems to summarize market reports, analyze customer feedback, evaluate business documents, and identify potential risks. These capabilities allow decision makers to consider broader information before selecting a course of action.

In addition, LLMs may improve decision-making efficiency by reducing the time required to complete information-intensive tasks. Tasks that previously required significant manual effort, such as preparing reports, reviewing documents, or organizing information, can be accelerated through AI assistance.

However, researchers emphasize that efficiency improvements do not automatically guarantee better decisions. The accuracy and usefulness of AI-generated outputs depend on data quality, model limitations, and human evaluation. Therefore, LLMs should be considered supportive technologies rather than independent decision makers.

Supporting Operational and Strategic Decision Making

LLMs have applications across both operational and strategic levels of organizational decision making.

At the operational level, LLMs can support daily business activities by assisting with customer communication, workflow automation, documentation, and information retrieval. These applications can improve productivity and reduce repetitive administrative tasks.

At the strategic level, LLMs can assist managers by analyzing external information, summarizing industry trends, supporting scenario evaluation, and generating insights that contribute to strategic planning. For organizations operating in technology-focused environments, such as BAB International Corp., these capabilities may support innovation, customer engagement strategies, and digital transformation initiatives.

Nevertheless, strategic decisions involve complex considerations that extend beyond information analysis. Factors such as organizational vision, ethical considerations, market understanding, and leadership judgment remain essential. Therefore, the most effective approach is a combination of AI-supported analysis and human decision-making expertise.

Challenges Affecting the Relationship Between LLMs and Decision Making

Although LLMs provide significant opportunities for improving decision support, several challenges influence their effectiveness within organizations.

One major challenge is reliability. LLMs may generate incorrect or incomplete information despite producing responses that appear convincing. This limitation requires organizations to establish verification processes and maintain human oversight.

Another challenge is governance. Organizations must develop policies regarding responsible AI usage, data protection, security, and accountability. Without appropriate governance mechanisms, organizations may face risks related to privacy, compliance, and inappropriate reliance on AI-generated recommendations.

Organizational readiness is also a critical factor. Successful LLM adoption requires technological infrastructure, employee awareness, and strategic alignment between AI capabilities and business objectives. Organizations must identify appropriate use cases rather than implementing AI technology without a clear purpose.

Therefore, the relationship between LLMs and business decision making is not purely technological. It is influenced by organizational capabilities, management practices, and the ability to integrate AI responsibly.

Research Gap and Relevance to BAB International Corp.

Although existing literature highlights the potential of AI and LLM technologies in supporting organizational decision making, several research gaps remain. First, many existing studies focus on the technical capabilities of LLMs rather than examining their practical role within business organizations.

Second, empirical research regarding LLM adoption in Saudi Arabian organizations remains limited. While Saudi Arabia has actively promoted digital

transformation and AI adoption, academic studies examining how organizations utilize these technologies for decision support are still developing.

Third, previous research often examines AI adoption at a general organizational level without considering how different companies utilize AI according to their specific business models and operational requirements.

This research addresses these gaps by examining BAB International Corp. as a case study of an organization operating within an AI-enabled business environment. The study focuses on understanding how LLM technologies can support business decision making through improved information processing, knowledge accessibility, automation, and strategic support.

By analyzing this relationship, the research contributes to a deeper understanding of how organizations can utilize LLM capabilities while considering practical challenges related to implementation, governance, and responsible AI adoption.

2.5. Conclusion

This chapter reviewed the existing literature related to Large Language Models (LLMs) and business decision making in order to establish the theoretical foundation of the research. The literature demonstrates that the development of Artificial Intelligence, particularly Generative AI and LLM technologies, has created new opportunities for organizations to improve information processing, knowledge management, automation, and decision-support capabilities.

The review of Large Language Models as the independent concept highlighted their ability to understand natural language, process large amounts of information, generate meaningful outputs, and support various business functions. Previous studies indicate that LLMs have the potential to enhance organizational capabilities by improving access to knowledge, reducing time spent on information-related tasks, and supporting employees in complex problem-solving activities. However, the literature also emphasizes that successful LLM adoption requires appropriate governance, technological readiness, data management practices, and human oversight.

The review of business decision making as the dependent concept demonstrated that effective decisions depend on the availability and interpretation of relevant information. As organizations operate within increasingly complex and competitive environments, managers face challenges related to information overload, uncertainty, and limited decision-making time. AI-enabled technologies provide new approaches for addressing these challenges by supporting managers with improved analytical capabilities and faster access to organizational knowledge.

The relationship between Large Language Models and business decision making suggests that LLMs can contribute to enhanced decision support through improved information processing, knowledge accessibility, operational efficiency, and strategic analysis. Nevertheless, existing research indicates that LLMs should not replace human decision makers but rather function as supportive technologies that enhance managerial capabilities.

Despite the growing interest in LLM technologies, several research gaps remain. Much of the existing literature focuses on technical capabilities of AI systems rather than examining their practical organizational applications. Furthermore, limited empirical research has investigated how organizations in Saudi Arabia utilize LLM-based technologies to support business decision making. This creates an opportunity to explore the role of LLMs within a real organizational context.

Therefore, this research addresses this gap by analyzing the role of Large Language Models in supporting business decision making through a case study of BAB International Corp. The study aims to contribute to the understanding of how organizations can utilize LLM technologies according to their specific business needs while considering the opportunities and challenges associated with AI adoption.

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