

**EMPOWERING DECISION MAKING WITH ARTIFICIAL
INTELLIGENCE IN BUSINESS AND COMPANY**

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DECLARATION

i. This project entitled “***Empowering decision making with artificial intelligence in business and company***” is my original work and has not been presented for a degree in any other University or for any other award

Students Name: Abdillah Rajabu

Sign

Date 2024

ii. I confirm that the work reported in this project was carried out by the candidate under my supervision.

Name: Mr. Charles

Sign.

Date 2024

DEDICATION

In the labyrinth of life to my father, Mr Rajabu for his endless encouragement,
and to my mother, for her unwavering support throughout this journey.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my supervisor, Mr. Charles, for his invaluable guidance, support, and encouragement throughout the course of this research. His expertise and insightful feedback were instrumental in shaping this work.

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Abstract

The integration of Artificial Intelligence (AI) into business operations has revolutionized decision-making processes, providing companies with advanced tools for data analysis, forecasting, and strategic planning. This abstract explores the role of AI in enhancing business intelligence, optimizing operational efficiency, and facilitating innovation. By leveraging machine learning algorithms and predictive analytics, businesses can gain deeper insights into market trends, customer behavior, and operational performance. The deployment of AI-driven solutions enables real-time decision-making, reduces human error, and supports the development of proactive strategies. This paper discusses key AI technologies, their applications in various business domains, and the transformative impact they have on organizational decision-making processes. Through case studies and practical examples, we illustrate how companies are successfully integrating AI to drive growth, improve competitiveness, and achieve sustainable success.

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APPENDECES

- A. Questionnaire
- B. Budget
- C. Work plan
- D. Program code
- E. Any Other evidences such as pictures

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VII. LIST OF FIGURES

IX. LIST OF ACRONYMS AND ABBREVIATION.

KIUT – Kampala international university

AIHMs - Artificial intelligence health monitoring system

HTML - Hypertext markup language

CSS – Cascading Style Sheet

AI – Artificial Intelligence

IoT – Internet of Things

APIs – application programming interfaces

DBMS – database management system

UML – unified model language

MVC – model view controller

UI – User Interface

UX – user experience

SDLC – Software Development Lifecycle

ML – machine learning

VCS – Version Control System

AR – Augmented Reality

VR – Virtual Reality

XI. DEFINITIONS OF KEY TERMS

Artificial intelligence,

is a branch of computer science by which we can create intelligent machines which can behave like a human, think like humans, and able to make decisions

Machine learning,

Is defined as discipline of artificial intelligence (AI) that provides machines the ability to automatically learn from data and past experiences to identify patterns and make prediction with minimal human intervention.

CHAPTER ONE:

INTRODUCTION

1.1 Introduction

This chapter sets the foundation for the study by providing an introduction to the research topic. It includes the background of the study, problem statement, objectives of the study, research questions, significance, limitations, scope, and the organization of the study.

1.2 Background of the Study

The advent of Artificial Intelligence (AI) has significantly transformed decision-making processes within businesses. Companies now leverage AI for data analysis, forecasting, and strategic planning, which enhances operational efficiency and competitive advantage. This study focuses on how AI technologies are applied in business decision-making, the challenges encountered, and the potential for future applications. According to Davenport and Ronanki (2018), AI's integration into business processes allows for more informed and swift decisions, which is crucial in the fast-paced market environment.

1.3 Problem Statement

Despite the potential benefits of AI in decision-making, many businesses struggle with its implementation and optimization. Challenges include data quality issues, lack of skilled personnel, and integration with existing systems. Previous studies have highlighted these issues but failed to provide comprehensive solutions tailored to diverse business environments (Mikalef et al., 2018). This research seeks to address these gaps by exploring effective strategies for AI integration and usage in decision-making processes, thus enhancing business performance.

1.4 Objectives of the Study

1.4.1 General Objective

The primary objective of this study is to investigate the impact of AI on decision-making processes in businesses, focusing on how AI tools and technologies enhance operational efficiency and strategic planning.

1.4.2 Specific Objectives

- (i) To assess the current state of AI adoption in business decision-making.

(ii) To identify the key challenges businesses face in integrating AI into their decision-making processes.

(iii) To evaluate the effectiveness of different AI technologies in improving business outcomes.

(iv) To develop a framework for optimizing AI implementation in decision-making.

1.5 Research Questions

Based on the specific objectives, the research questions are:

(i) What is the current state of AI adoption in business decision-making?

(ii) What key challenges do businesses face in integrating AI into their decision-making processes?

(iii) How effective are different AI technologies in improving business outcomes?

(iv) What framework can optimize AI implementation in decision-making?

1.6 Significance of the Study

This study is expected to benefit business leaders, AI practitioners, and policymakers by providing insights into effective AI adoption strategies. It will help businesses enhance their decision-making processes, leading to improved operational efficiency and competitiveness. Future research can also build on the findings to explore new AI applications in business.

1.7 Limitations of the Study

The study's findings may be limited by the diversity of businesses and the specific AI technologies they use, which may affect the generalizability of the results. Additionally, the rapidly evolving nature of AI technology may render some insights outdated quickly. These limitations are inherent to the scope and timeframe of the research and are beyond the control of the researcher.

1.8 Scope of the Study

The study will focus on the concept of AI in decision-making within businesses, covering content related to AI technologies, their implementation, and impact. Geographically, the study will target businesses in a specific region, ensuring a representative sample. The time scope will include recent advancements and applications of AI over the past five years.

1.9 Organization of the Study

The study is structured into five chapters. Chapter One provides an introduction, including background, problem statement, objectives, research questions, significance, limitations, scope, and organization of the study. Chapter Two reviews related literature. Chapter Three outlines the research methodology. Chapter Four presents the findings and analysis. Chapter Five concludes with discussions, recommendations, and suggestions for future research.

CHAPTER TWO:

LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing literature relevant to the study. It includes a theoretical framework, a discussion of similar systems, a critical review identifying research gaps, and a summary of key issues raised in the chapter.

2.2 Theoretical Literature

The theoretical framework for this study is built on the principles of Artificial Intelligence (AI) in business decision-making. Theories such as Decision Theory, Machine Learning, and Data Mining are integral to understanding AI's impact. Decision Theory provides a foundation for making rational choices under uncertainty (Von Neumann & Morgenstern, 1944). Machine Learning enables systems to learn from data and improve decision-making over time (Mitchell, 1997). Data Mining techniques help in extracting useful patterns from large datasets, facilitating informed decisions (Fayyad, Piatetsky-Shapiro, & Smyth, 1996).

2.3 Similar Systems

Several systems have been developed to incorporate AI in business decision-making. This section reviews five similar systems, comparing them with the proposed system.

1. **IBM Watson:** A global AI system that provides natural language processing and machine learning to reveal insights from large amounts of unstructured data (Ferrucci et al., 2010). Differences include the scope of data analysis and customization capabilities.
2. **Google Cloud AI:** Offers machine learning models and tools for data-driven decision-making. It provides advanced analytics and real-time insights but may lack industry-specific customization (Google Cloud, 2021).
3. **Salesforce Einstein:** An AI-driven CRM platform that enhances customer relationship management with predictive analytics (Salesforce, 2021). Unlike the proposed system, it focuses primarily on CRM rather than comprehensive business decision-making.
4. **Microsoft Azure AI:** Provides a range of AI services for building intelligent applications, with strong integration capabilities (Microsoft, 2021). The proposed system aims to offer more specialized decision support for smaller businesses.
5. **SAP Leonardo:** Integrates AI and machine learning into business processes to drive digital transformation (SAP, 2021). The proposed system differs by targeting specific decision-making challenges faced by SMEs.

2.4 Critical Review and Research Gap Identification

While existing systems like IBM Watson, Google Cloud AI, and Salesforce Einstein offer comprehensive AI tools, they often lack customization for small to medium-sized enterprises (SMEs) and specific industry contexts. The proposed system aims to fill this gap by

providing tailored AI solutions that address the unique decision-making challenges of SMEs. This customization and focus on specific industries represent the innovation and unique contribution of the proposed system.

2.5 Chapter Summary

This chapter reviewed theoretical literature on AI in business decision-making, analyzed five similar AI systems, and identified the research gap that the proposed system aims to fill. The theoretical frameworks, including Decision Theory, Machine Learning, and Data Mining, provide a strong foundation for understanding the study's context. The review of similar systems highlights the need for a customized AI solution for SMEs, addressing a critical gap in the current market.

CHAPTER THREE:

METHODOLOGY

3.1 Introduction

This chapter details the research methodology used in this study. It includes the research design, target population, sample size, data collection procedures and instruments, system development methodology, system requirements analysis, database design, testing design, and a chapter summary.

3.2 Research Design

This study employs a descriptive research design, which allows for a comprehensive analysis of the impact of AI on business decision-making. Descriptive research helps in understanding the characteristics of the population and phenomena being studied without influencing them.

3.2.1 Target Population

The target population for this study comprises small to medium-sized enterprises (SMEs) in the technology sector. This demographic is chosen due to their increasing reliance on AI for decision-making.

3.2.2 Sample Size

A sample size of 50 SMEs will be selected using stratified random sampling to ensure representation from various industry segments within the technology sector. This sample size is adequate for generalizing the findings to the broader population of SMEs.

3.2.3 Data Collection Procedure & Instruments

Data will be collected through surveys and interviews. Surveys will be distributed electronically to gather quantitative data on AI usage, challenges, and outcomes. Interviews will be conducted with key decision-makers to gain qualitative insights into their experiences and perspectives on AI implementation.

3.3 System Development Methodology

The Agile methodology will be used for system development. Agile allows for iterative development, continuous feedback, and flexibility to adapt to changing requirements.

3.3.1 Methodology Justification

The Agile methodology is chosen due to its iterative nature, which supports continuous improvement and adaptation. It is particularly suitable for projects involving emerging technologies like AI, where requirements may evolve during development.

3.4 System Requirement Analysis

3.4.1 Functional Requirements

Functional requirements specify what the system should do. They include:

Data analysis and visualization

Predictive analytics

Real-time decision support

User management

3.4.2 Non-Functional Requirements

Non-functional requirements specify how the system performs its functions. They include:

System reliability

Performance efficiency

Security and privacy

Usability

3.4.3 Modeling Language

Unified Modeling Language (UML) will be used for system modeling to visualize the design and functionality of the system.

3.4.2.1 Use Case Modeling

Use case modeling will identify and define the interactions between users and the system.

3.4.2.2 Activity Diagram

Activity diagrams will illustrate the workflow and processes within the system.

3.4.2.3 Sequence Diagram

Sequence diagrams will show how objects interact in a particular sequence to accomplish a specific task.

3.4.2.4 Class Diagram

Class diagrams will define the structure of the system by showing its classes, attributes, methods, and relationships.

3.4.2.5 Deployment Diagram

Deployment diagrams will depict the physical deployment of artifacts on nodes.

3.5 Database Design

3.5.1 Table Design

The database will consist of multiple tables, each representing different entities such as users, data logs, and AI models. The design will ensure efficient data storage and retrieval.

3.5.2 3NF Normalized Form

The database will be normalized to the Third Normal Form (3NF) to eliminate redundancy and ensure data integrity.

3.6 Testing Design

The system will be tested using a combination of unit testing, integration testing, and user acceptance testing to ensure functionality, performance, and usability.

3.6.1 Test Cases

Test cases will be developed to cover all functional and non-functional requirements. Each test case will specify the input, execution conditions, and expected outcomes.

3.7 Chapter Summary

This chapter outlined the methodology for the study, including research design, target population, sample size, data collection methods, system development methodology, system requirements analysis, database design, and testing design. The chosen methodologies and approaches are justified and detailed to ensure a thorough and effective research process.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the research findings and discussions based on the study objectives. It includes detailed analysis and interpretation of the data collected, supported by relevant screenshots and examples from the developed system.

4.2 Presentation of Findings

Each research objective is addressed in this section, providing a comprehensive analysis of the data and results obtained.

4.3.1 Objective 1:

Assess the Current State of AI Adoption in Business Decision-Making

Findings: Present the data collected on AI adoption rates, types of AI technologies used, and industries most engaged in AI implementation.

Discussion: Interpret the findings, comparing them with existing literature and theories. Highlight any trends, challenges, and opportunities identified.

4.3.2 Objective 2:

Identify Key Challenges Businesses Face in Integrating AI into Decision-Making Processes

Findings: Outline the major challenges reported by businesses, such as data quality issues, lack of skilled personnel, and integration difficulties.

Discussion: Analyze the implications of these challenges on business operations and decision-making efficiency. Compare with previous studies and discuss potential solutions.

4.3.3 Objective 3:

Evaluate the Effectiveness of Different AI Technologies in Improving Business Outcomes

Findings: Provide data on the performance of various AI technologies, including metrics on improved decision-making, operational efficiency, and business outcomes.

Discussion: Assess the effectiveness of these technologies, drawing comparisons with existing literature and theoretical frameworks.

4.3.4 Objective 4:

Develop a Framework for Optimizing AI Implementation in Decision-Making

Findings: Present the developed framework, including screenshots and examples from the system.

Logging in Screenshot: Display and describe the system login interface.

Data Entry Forms Screenshot: Show the forms used for data entry.

Query Output Screenshot: Provide examples of query outputs generated by the system.

Reports Screenshot: Present sample reports produced by the system.

Validation Screenshot: Illustrate the validation processes within the system.

Discussion: Discuss how the framework addresses the identified challenges and improves AI integration in decision-making processes.

4.4 Chapter Summary

Summarize the key findings and discussions presented in this chapter. Highlight the major insights gained from the research and how they contribute to the study's objectives.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the research findings, presents conclusions, and offers recommendations based on the study. It also suggests areas for further research.

5.2 Summary of Findings

This section provides an overview of the key findings from the study, organized by research objective.

5.2.1 Objective One

Summary: Summarize the findings related to the current state of AI adoption in business decision-making.

5.2.2 Objective Two

Summary: Summarize the findings related to the challenges businesses face in integrating AI into decision-making processes.

5.2.3 Objective Three

Summary: Summarize the findings related to the effectiveness of different AI technologies in improving business outcomes.

5.2.4 Objective Four

Summary: Summarize the findings related to the development and implementation of the AI optimization framework.

5.3 Conclusions

Provide detailed answers to the research questions, based on the findings. Each conclusion should be specific and directly related to the study's objectives and questions.

5.4 Recommendations

Offer practical recommendations for businesses, policymakers, and researchers based on the study's conclusions. These should be actionable and aligned with the study area.

5.5 Suggestions for Further Study

Identify potential areas for future research that emerged from the study. These suggestions should build on the findings and address any gaps or limitations identified.

5.6 Chapter Summary

Summarize the key points from this chapter, reinforcing the study's contributions and the implications of the findings.