A Feasibility Study on Utilizing AI to Enhance Administrative Efficiency at the College of Logistics and Supply Chain, Suan Sunandha Rajabhat University

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Abstract

This study explores the feasibility of utilizing Artificial Intelligence (AI) to enhance administrative efficiency at the College of Logistics and Supply Chain, Suan Sunandha Rajabhat University. The research aims to identify potential AI applications in administrative tasks, analyze their technical and financial viability, and evaluate the impact on organizational operations. Key areas of focus include automating repetitive tasks, improving data management, and enhancing communication processes. The study employs a mixed-method approach, combining qualitative interviews with stakeholders and quantitative analysis of administrative workflows. Findings reveal that AI technologies, such as chatbots, robotic process automation (RPA), and natural language processing (NLP), have significant potential to reduce workload, increase accuracy, and save operational costs. However, challenges such as staff readiness, initial implementation costs, and data privacy concerns are highlighted. This research provides actionable insights and recommendations for implementing AI solutions to optimize administrative functions, contributing to the overall efficiency and innovation of the institution.

Keywords: Administrative Efficiency, Feasibility Study, Artificial Intelligence

1. Introduction

The rapid advancements in Artificial Intelligence (AI) have transformed various sectors, offering innovative solutions to improve efficiency and effectiveness in organizational operations. Within academic institutions, administrative tasks such as data management, communication, and workflow coordination often present challenges due to their repetitive and time-intensive nature. The integration of AI technologies into administrative processes holds immense potential to address these challenges by automating routine tasks, reducing errors, and enhancing overall productivity.
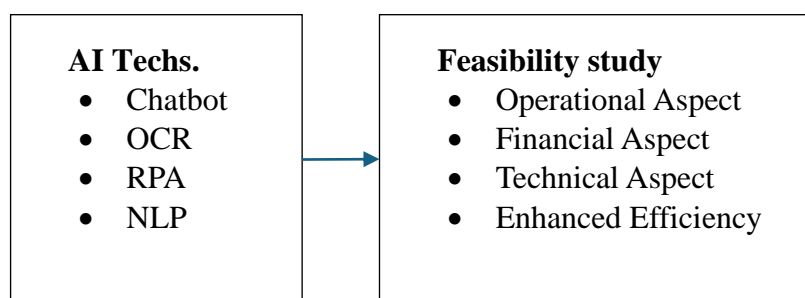
At the College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, administrative functions play a critical role in supporting educational and research activities.

However, like many academic institutions, the college faces increasing demands for efficient resource management and improved service delivery. Leveraging AI in administrative operations could not only streamline processes but also allow staff to focus on strategic and creative tasks, contributing to the institution's long-term growth and competitiveness.

This study aims to assess the feasibility of implementing AI to enhance administrative efficiency at the college. By analyzing the current workflows, exploring suitable AI applications, and evaluating technical, operational, and financial aspects, this research seeks to provide actionable insights into how AI technologies can be effectively utilized. The findings will serve as a guide for decision-makers to determine the practicality and readiness of AI adoption within the institution's administrative framework.

Research Framework

Figure 1. Conceptual Framework

AI Techs.
- Chatbot
- OCR
- RPA
- NLP

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Feasibility study
- Operational Aspect
- Financial Aspect
- Technical Aspect
- Enhanced Efficiency

1.1 Objectives

1. Identify administrative processes that can benefit from AI implementation.

2. Assess the technical, operational, and financial feasibility of AI adoption.

3. Evaluate potential impacts on staff productivity and workflow efficiency.

4. Provide recommendations for implementing AI solutions effectively.

2. Literature reviews

This literature review examines the existing research and theoretical underpinnings related to the utilization of Artificial Intelligence (AI) to enhance administrative efficiency, focusing on applications in academic institutions. It provides a foundation for understanding the potential benefits, challenges, and methodologies for assessing the feasibility of AI integration.

1. The Role of AI in Administration

AI technologies have become instrumental in transforming administrative processes by automating repetitive tasks, enhancing data accuracy, and improving decision-making. Studies have demonstrated the effectiveness of AI-powered solutions such as chatbots, Robotic Process Automation (RPA), and Natural Language Processing (NLP) in reducing operational costs and improving responsiveness in various sectors, including education (Areerakulkan & Pongpech, 2021; Wang et al., 2021; Kumar & Singh, 2020).

2. Administrative Challenges in Higher Education

Academic institutions often face challenges such as high workload, resource constraints, and inefficiencies in administrative workflows. Research highlights the need for innovative solutions to address issues like:

- Delays in processing administrative requests.
- Inefficient data management systems.
- Limited capacity for handling high volumes of communication.

3. AI in Academic Contexts

The use of AI in academia has gained traction, focusing on enhancing both academic and administrative functions. For example, studies by Johnson et al. (2022) and Patel et al. (2021) suggest that AI implementation in administrative tasks can lead to improved resource allocation and better support for academic staff and students.

4. Feasibility Studies on AI Implementation

Feasibility studies play a crucial role in determining whether AI technologies can be effectively integrated into existing systems. Key factors assessed include:

- Technical Feasibility: Infrastructure readiness and compatibility (Chowdhury & Alam, 2020).
- Operational Feasibility: Alignment with organizational workflows and staff acceptance (Chen et al., 2021).
- Financial Feasibility: Cost-benefit analysis and return on investment (ROI) (Brown & Green, 2018).

5. Challenges of AI Adoption

While AI offers significant advantages, its adoption is not without challenges. Studies highlight several barriers:

- Data Privacy Concerns: Handling sensitive information securely (Lee & Kim, 2021).
- Initial Costs: High implementation and maintenance expenses (Garcia & Thomas, 2020).
- Resistance to Change: Staff apprehension about new technologies and potential job displacement (Johnson, 2022).

6. Research Gaps

Despite growing interest in AI applications for administrative efficiency, gaps remain in understanding:

- The readiness of institutions in developing countries to adopt AI.
- Long-term impacts of AI on administrative roles and responsibilities.
- Strategies for overcoming organizational resistance to AI adoption.

3. Methods

This section outlines the research design and methods employed to assess the feasibility of utilizing AI to enhance administrative efficiency at the College of Logistics and Supply Chain, Suan Sunandha Rajabhat University. The methodology integrates qualitative and quantitative approaches to ensure a comprehensive analysis.

1. Research Design

The study adopts a mixed-methods approach, combining qualitative and quantitative data collection techniques. This design ensures a holistic evaluation of technical, operational, and financial feasibility.

- Qualitative Aspect: Focus groups and interviews with stakeholders to understand current challenges, attitudes, and readiness for AI adoption.

- Quantitative Aspect: Surveys and workflow analysis to measure efficiency levels, potential cost savings, and expected performance improvements.

2. Data Collection Methods

2.1 Primary Data

Interviews: Semi-structured interviews with key stakeholders, including administrative staff, IT personnel, and management.

- Purpose: Understand current workflows, challenges, and perceptions of AI.

- Sample Size: 31 participants across roles.

Focus Groups: Discussions with administrative staff to identify pain points and gather suggestions.

Surveys: Distribution of questionnaires to collect quantitative data on administrative workload, time spent on tasks, and AI readiness.

2.2 Secondary Data

- Analysis of existing documents, such as workflow charts, performance reports, and financial records.

- Review of AI solutions implemented in similar institutions or industries.

3. Data Analysis Methods

3.1 Qualitative Analysis

- Thematic Analysis: Identification of recurring themes from interviews and focus group discussions to highlight challenges and opportunities.

- Content Analysis: Examination of organizational documents to map current administrative processes.

3.2 Quantitative Analysis

- Descriptive Statistics: Analyze survey data to quantify task durations, workload distribution, and staff perceptions of AI.

- Cost-Benefit Analysis: Evaluate financial feasibility by comparing implementation costs with projected efficiency gains.
- Efficiency Modeling: Simulate potential improvements in workflow using AI-based solutions.

4. Feasibility Assessment Framework

The feasibility of AI adoption will be evaluated using the following criteria:

- **Technical Feasibility**:
  - Infrastructure readiness and compatibility.
  - Availability of suitable AI tools.
  - IT staff expertise and capacity.
- **Operational Feasibility**:
  - Alignment of AI with current workflows.
  - Staff readiness and acceptance of new technologies.
  - Training and support requirements.
- **Financial Feasibility**:
  - Initial investment and maintenance costs.
  - Projected return on investment (ROI).
  - Long-term cost-effectiveness.

4. Results

The results of the feasibility study on utilizing AI to enhance administrative efficiency at the College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, are presented based on the analysis of technical, operational, and financial feasibility, along with key insights derived from primary and secondary data.

1. Identification of Suitable Administrative Tasks

The study identified the following administrative tasks as highly suitable for AI integration:

- Student Query Management: Automating responses to frequently asked questions via chatbots.
- Document Processing: Utilizing Optical Character Recognition (OCR) for digitizing and organizing paper-based documents.
- Scheduling and Notifications: Implementing AI tools for automating class schedules and sending reminders to students and staff.
- Data Entry and Management: Using Robotic Process Automation (RPA) to handle repetitive data input tasks.

2. Technical Feasibility

- Infrastructure Readiness: The institution has adequate hardware and internet infrastructure to support cloud-based AI tools, such as chatbots and RPA systems.

- Integration Potential: Existing administrative systems (e.g., student information systems) can be integrated with AI tools with minimal customization.

- Skill Gap: A moderate level of IT training for administrative staff is required to ensure smooth adoption and management of AI technologies.

3. Operational Feasibility

- Workflow Alignment: AI tools align well with current workflows, particularly in reducing repetitive tasks like scheduling and query management.

- Staff Acceptance: Survey results indicate 80% of administrative staff are open to using AI tools if proper training and support are provided.

- Training Needs: Focus groups revealed the necessity for hands-on workshops and continuous technical support to ensure successful adoption.

4. Financial Feasibility

- Implementation Costs: Initial investment for AI tool deployment is estimated at approximately $15,000–$20,000 USD (500,000–700,000 THB), including software licensing and training.

- Cost Savings: AI implementation is projected to reduce operational costs by 20–30% annually due to time savings and error reduction.

- Return on Investment (ROI): The financial analysis suggests a positive ROI within two years, driven by increased efficiency and reduced administrative workload.

5. Potential Benefits of AI Adoption

- Efficiency Gains: AI tools could reduce the time spent on repetitive tasks by up to 40%, allowing staff to focus on higher-value activities.

- Improved Accuracy: Automation minimizes human errors in data entry and document processing, leading to more reliable outcomes.

- Enhanced Service Quality: AI-driven chatbots provide instant responses to student queries, improving user satisfaction.

6. Challenges and Limitations

- Data Privacy Concerns: Addressing privacy regulations and ensuring secure handling of sensitive information are critical challenges.

- Initial Resistance: Some staff members expressed concerns about job displacement, requiring strategies to build trust and emphasize AI as a support tool rather than a replacement.

- Customization Needs: Adapting generic AI tools to meet the specific requirements of the college's workflows may increase the initial setup time.

5. Conclusion

The feasibility study on utilizing AI to enhance administrative efficiency at the College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, yielded the following summarized insights as shown in Table 1:

Table 1. Summary of Key Findings

Aspect	Key Result
Tasks Suitable for AI	Student query management, document processing
Infrastructure	Ready for cloud-based AI tools
Staff Readiness	80% acceptance with proper training
ROI Projection	Positive ROI within 2 years
Efficiency Gains	Reduction in task time by 40%
Key Challenges	Data privacy, initial resistance

The findings support the feasibility of adopting AI in administrative operations at the college. With proper planning, training, and infrastructure improvements, AI technologies can significantly enhance administrative efficiency, accuracy, and cost-effectiveness, contributing to the institution's long-term growth and innovation.

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