ANALYZING AND ENHANCING QUESTION-ANSWERING SYSTEMS BASED ON CLOUD TECHNOLOGY TO IMPROVE THE OPERATIONAL EFFICIENCY OF THE OFFICE OF GENERAL EDUCATION AND INNOVATIVE ELECTRONIC LEARNING

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ABSTRACT

This research aimed to enhance the operational efficiency of The Office of General Education and Innovative Electronic Learning through the analysis and development of a cloud-based question-answering system. The study focused on two primary objectives: firstly, to analyze and improve the existing question-answering repository utilizing cloud technology, and secondly, to assess the satisfaction levels of students, faculty, and staff regarding the system. The implementation of the cloud-based question-answering system involved testing among 1,600 students and 25 staff members during the first semester of the academic year 2023. The results revealed a remarkable satisfaction level, with an overall score of 4.52, signifying a substantial contribution to operational efficiency within the General Education Department. The system's implementation resulted in efficient question management for students and user-friendly access for both students and staff. Furthermore, the collaborative and knowledge-sharing aspects of the system fostered unity among different departments, cultivating a cooperative learning environment.

Keywords: Cloud Computing, General Education, Analysis, Development

INTRODUCTION

The pursuit of operational efficiency within educational institutions has become increasingly paramount, necessitating innovative approaches to address evolving challenges. In this context, our research centers on the analysis and enhancement of question-answering systems within The Office of General Education and Innovative Electronic Learning, leveraging the capabilities of cloud technology. This introduction provides a glimpse into the primary objectives of the study and its broader implications for fostering operational efficiency.

Jarumon Nookhong and Panita Wannapiroon (2015, p.2097). Cloud computing model is a computing model for massive IT structure which can be transferred to internet users (Gartner, 2008) via cloud technology. This works on cloud computing system built upon the model of web browser or application as an instrument supporting learning activities. This influences the learners directly in terms of perspectives and new learning models, and becomes a communication medium between learners and instructors.

The primary goal of our research is twofold. First, we aim to thoroughly analyze and enhance the existing question-answering repository by harnessing the potential of cloud technology. This strategic endeavor is specifically designed to uplift the operational efficiency of General Education Departments, acknowledging the pivotal role efficient information retrieval plays in academic processes.

Secondly, we delve into the subjective experiences of students, faculty, and staff within the General Education Department to gauge their satisfaction levels with the question-answering

repository. Recognizing the human element in the utilization of such systems is critical for ensuring that technological interventions align with the diverse needs and expectations of the end-users.

Against the backdrop of these objectives, the research unfolds within the context of a cloud-based question-answering system implemented and tested during the first semester of the academic year 2023. By engaging with a substantial cohort of 1,600 students and 25 staff members, our study seeks to provide nuanced insights into the system's impact on operational efficiency and user satisfaction.

RESEARCH OBJECTIVES

This research study was aimed to
1) To analyze and enhance the question-answering repository based on cloud technology, aiming to foster the operational efficiency of the General Education Department.
2) To investigate the satisfaction levels of students, faculty, and staff towards the question-answering repository within the General Education Department.

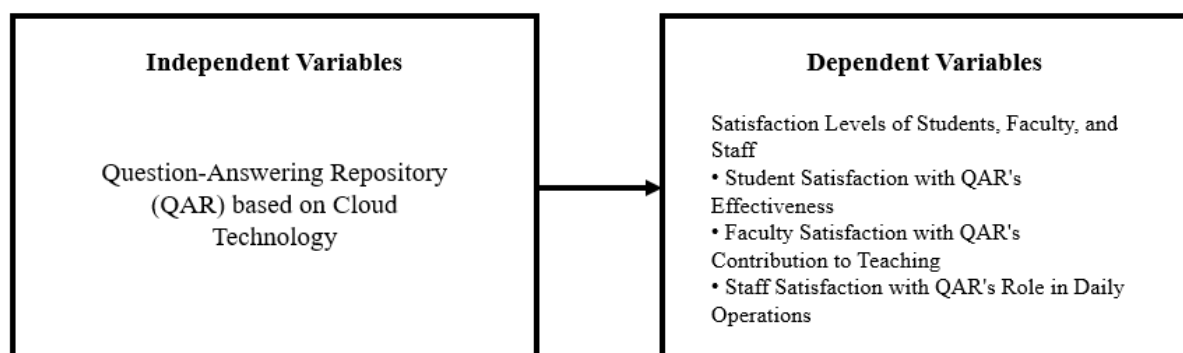## CONCEPTUAL FRAMEWORK

Figure 1. Conceptual Framework of the Study

From Figure 1. shows a diagram of the relationship between satisfaction levels of students, faculty, and staff with questions measuring repository use on cloud technology. The diagram The primary goal of our research is twofold. First, we aim to thoroughly analyze and enhance the existing question-answering repository by harnessing the potential of cloud technology. This strategic endeavor is specifically designed to uplift the operational efficiency of General Education Departments, acknowledging the pivotal role efficient information retrieval plays in academic processes.

METHODOLOGY

1. Population and Sample Group
The population consists of personnel from The Office of General Education and Innovative Electronic Learning, as well as students enrolled in General Education courses during the first semester of the academic year 2023. The experimental sample group includes:
Education Service Personnel: 14 individuals

Research and Development Personnel: 4 individuals
General Administrative Personnel: 4 individuals
Budget Planning and Quality Assurance Personnel: 3 individuals
Students enrolled in General Education courses: 1,600 individuals.

2. Study Methods

2.1 Brainstorming Meetings for Data Exploration: Conduct meetings to gather and explore information.

2.2 Collection and Analysis of User Needs: Gather and analyze user problems and requirements related to the cloud-based question-answering repository of the General Education Department.

2.3 Designing Repository Management with Cloud Technology: Design management strategies for the question-answering repository based on cloud technology.

2.4 Pilot Testing the Enhanced Repository: Implement the enhanced question-answering repository with the experimental sample group to identify flaws and make necessary adjustments.

2.5 Brainstorming Meetings for System Enhancement: Conduct meetings to enhance the question-answering repository based on feedback from the initial usage.

2.6 Real-world Implementation and Data Collection: Implement the enhanced repository with the actual user population for three months, collecting and processing data and measuring user satisfaction.

2.7 Presentation of Research Findings: Present research findings to the management for dissemination and wider adoption both internally and externally.

3. Location

The Office of General Education and Innovative Electronic Learning, Suan Sunandha Rajabhat University.

4. Study Period

October 1, 2022, to August 31, 2023.

5. Data Analysis

Research hypotheses and statistical assumptions: Null Hypothesis (H0): The satisfaction level of users with the question-answering system is less than or equal to 3.51. H0: $\mu \leq 3.5$; Alternative Hypothesis (H1): The satisfaction level of users with the question-answering system is greater than 3.51. H1: $\mu > 3.51$

Average Calculation:

$$\bar{x} = \frac{\sum x_i}{n}$$

Standard Deviation Calculation:

$$S.D. = \sqrt{\frac{\Sigma(x_i - \bar{x})^2}{N}}$$

<div align="center">

RESULT

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In the study titled "Analysis and Development of Cloud-Based Question and Answer Repository to Enhance the Efficiency of General Education Office," the following results were obtained:

The study involved respondents who completed the satisfaction assessment questionnaire on the cloud-based question and answer repository technology. The participants included 1,600 university students from Rajabhat University Suan Sunandha, first semester of the academic year 2023, and 25 staff members of the General Education Office. The distribution is detailed in Table 1

Table 1. General Information of Satisfaction Assessment Respondents for the Cloud-Based Question and Answer Repository Technology of the General Education Office

Category	Number	Percentage
Student	1,600	98.46
Staff	25	1.54
Total	**1,625**	**100**

The satisfaction assessment results are presented in Table 2, including percentages, average scores, and standard deviations for various aspects of the cloud-based question and answer repository technology.

Table 2. User Satisfaction with the Cloud-Based Question and Answer Repository Technology of the General Education Office

Evaluation Criteria	Satisfaction Level	Average Score	Standard Deviation
1. System efficiency, modernity, and reliability	4.57	0.50	Very Satisfied
2. Stability, security, and accessibility of the system	4.49	0.50	Very Satisfied
3. Currency of data in the system	4.52	0.50	Very Satisfied
4. User-friendliness of the system	4.52	0.50	Very Satisfied
5. Benefits derived from the system	4.44	0.50	Very Satisfied
6. Accuracy and speed of service provision	4.51	0.50	Very Satisfied
7. Clarity and promptness of guidance for system use	4.48	0.50	Very Satisfied
8. Convenience of system use	4.46	0.50	Very Satisfied
9. Accuracy and speed of service provision by staff	4.56	0.50	Very Satisfied
10. Knowledge and ability of staff to provide system services	4.68	0.47	Very Satisfied
Overall Satisfaction	**4.52**	**0.50**	**Very Satisfied**

The study demonstrates high user satisfaction with the cloud-based question and answer repository technology, reflected in an overall satisfaction score of 4.52 from Table 2. This research has significantly contributed to enhancing the operational efficiency of the General Education Office's management of the cloud-based question and answer system, particularly in the context of electronic learning innovation. It has facilitated convenient and efficient access to information for users, particularly streamlining the process of information retrieval for students, enabling them to search for information independently. Additionally, the research has aided in providing a more unified and consistent approach for the General Education Office staff, leading to reduced errors in information responses and an overall improvement in work efficiency.

A notable challenge encountered during the implementation of this system was ensuring data accuracy and an effective approval process. The dependency on data from the Educational Services department necessitated a thorough vetting and approval by department heads and deputy directors. This step was crucial to ensure the accuracy and completeness of the information, enabling swift and efficient usage by students.

CONCLUSION

The study aimed to analyze and develop a cloud-based question-answering system to improve the operational efficiency of the General Education Department. Implemented and tested with 1,600 students and 25 staff members during the first semester of the academic year 2023, the system received high approval ratings, evidenced by an overall satisfaction score of 4.52. These results indicate that the cloud-based system was effective in enhancing operational efficiency in the department. The introduction of this system streamlined the management of student inquiries and made it more convenient for both students and staff to use. Furthermore, the system fostered collaboration and knowledge sharing, thereby creating a sense of unity and cooperation across various departments, enhancing the overall learning environment.

ACKNOWLEDGMENTS

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