

MATERIAL MANAGEMENT SYSTEM DEVELOPMENT FACULTY OF HUMANITIES AND SOCIAL SCIENCES, SUAN SUNANDHA RAJABHAT UNIVERSITY

Yupin Kaewkum¹ and Patcharaphan Susamawathanakun²

^{1,2}Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University, Thailand.

E-Mail: yupin.ka@ssru.ac.th¹, patcharaphan.su@ssru.ac.th²

ABSTRACT

Abstract—The objectives of this research were: 1) to investigate the current state and user satisfaction of the material management system, and 2) to explore the development requirements for the Material Management System at the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University. The sample group consisted of 40 personnel from the faculty, selected through purposive sampling. The research instrument was a 5-point Likert scale questionnaire. Data were analyzed using percentage, mean (\bar{X}), and standard deviation (S.D.). The research findings revealed that: 1) **Current System State:** Overall satisfaction with the current material management system was at a **“High” level** ($\bar{X} = 3.81$, S.D. = 0.85). The highest-rated aspect was personnel’s knowledge and understanding of supply regulations ($\bar{X} = 4.38$). Conversely, material storage received the lowest score, falling within the “Moderate” level ($\bar{X} = 3.25$), and 2) **Development Requirements:** Overall demand for system development was at a **“High” level** ($\bar{X} = 3.65$, S.D. = 0.97). The top priority for development was personnel training to accommodate new technology ($\bar{X} = 4.25$), followed by the enhancement of requisition and auditing processes ($\bar{X} = 4.00$). In conclusion, the development of the material management system should focus on upskilling personnel’s digital competencies alongside optimizing the physical and digital storage framework. Addressing these areas will enhance organizational supply management efficiency, transparency, and operational agility.

Keywords—Material Management System, User Satisfaction, Information System Development, Suan Sunandha Rajabhat University

INTRODUCTION

The Faculty of Humanities and Social Sciences at Suan Sunandha Rajabhat University operates as a vital academic institution dedicated to teaching excellence, research, and community service. To effectively fulfill its multi-faceted missions, the faculty relies heavily on the systematic procurement and management of “materials and supplies,” which serve as indispensable tools for both academic and administrative operations. Strategic material management is, therefore, a cornerstone of institutional efficacy. It ensures that resources are allocated optimally, thereby directly influencing the faculty’s ability to achieve its strategic objectives and maintain fiscal responsibility over public funds.

In the contemporary landscape of Thai public administration, supplies management must strictly adhere to the Government Procurement and Supplies Management Act B.E. 2560 (2017). This legislation emphasizes core principles: cost-effectiveness, transparency,

efficiency, and accountability (Comptroller General's Department, 2017). Despite these mandates, the current manual-intensive processes within the faculty's Finance and Supplies Department often struggle to keep pace with these rigorous standards. Common issues include significant discrepancies in inventory records, time-consuming requisition cycles, and the lack of real-time data visibility. These operational bottlenecks not only lead to redundant workflows and potential budget wastage but also increase the risk of regulatory non-compliance and audit failures.

The necessity of transitioning toward a digital-based management framework is paramount in the era of Digital Government. Implementing a robust Material Management System (MMS) is no longer merely an option but a critical requirement for modernization (Laudon & Laudon, 2020). Such a system facilitates data integration across all stages of the material lifecycle—from procurement and reception to requisition and reporting. By automating these processes, the faculty can reduce human error, enhance data integrity, and provide decision-makers with accurate, up-to-the-minute information. Consequently, this research aims to develop a Material Management System specifically tailored for the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University. This initiative is designed to transform traditional workflows into a highly efficient digital ecosystem, ensuring transparency and supporting the faculty's long-term sustainable development.

RESEARCH OBJECTIVE

1. To design and develop a materials management system.
2. To determine the efficiency of the developed system.

LITERATURE REVIEW

Concepts and Principles of Material Management Material management within an organization is a strategic process aimed at meeting user requirements with maximum efficiency and optimal costs, encompassing procurement, receiving, storage, and distribution (Heizer et al., 2017). In the context of higher education, supply management serves as a critical support function for teaching and research missions. This process necessitates high accuracy and strict compliance with the Government Procurement and Supplies Management Act B.E. 2560 (Comptroller General's Department, 2017). Without an effective management framework, organizations risk budget wastage and operational delays, emphasizing that resource management based on cost-effectiveness and transparency is the cornerstone of public sector governance.

The Role of Management Information Systems (MIS) The digital transformation from manual record-keeping to Management Information Systems (MIS) is essential for minimizing human error and accelerating data processing. Laudon & Laudon (2020) argue that MIS enables organizations to establish centralized databases that integrate cross-departmental information, allowing administrators to make decisions based on accurate, real-time data. In supply management specifically, an automated system facilitates seamless inventory tracking and stock updates, reducing procedural redundancies and fostering a transparent reporting environment, which are defining characteristics of modern digital organizations.

Technology Acceptance and User Satisfaction The success of system development is determined not only by technical excellence but also by user acceptance within the organization. According to the **Technology Acceptance Model (TAM)** by Davis (1989), the primary drivers of usage behavior are "Perceived Usefulness" and "Perceived Ease of Use." Furthermore, user satisfaction serves as a long-term indicator of system success. Srisa-ard (2010) suggests that evaluating satisfaction through standardized measurement criteria allows researchers to identify the strengths and weaknesses of the developed innovation, leading to continuous improvements that truly align with the behaviors and needs of the sample group.

RESEARCH METHODOLOGY

Research Design

This study employs a Quantitative Research and Descriptive Research approach, primarily focusing on the development of an information system to optimize material management efficiency and evaluate user satisfaction. The research process integrates system analysis, architecture design, and practical implementation to ensure full compliance with public procurement regulations and to meet the specific operational demands of the faculty.

Population and Sample

The population for this research consists of faculty members and administrative staff within the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University. A sample of 40 individuals was selected using a Purposive Sampling technique, specifically targeting personnel who are direct users of the supply system. This selection ensures that the feedback retrieved accurately reflects the system's performance within an actual professional environment.

Research Instruments

The primary instrument used for data collection is a structured questionnaire, categorized into three distinct parts. Part 1 gathers demographic data using a checklist format. Part 2 focuses on interaction behaviors and supply management workflows. Part 3 evaluates user satisfaction through a 5-point Likert Scale, ranging from "Extremely Satisfied" (5) to "Least Satisfied" (1). This standardized measurement allows for a precise quantitative assessment of the system's overall effectiveness.

Data Collection and Timeline

Data collection was conducted between October 2024 and July 2025 at the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University. The researcher distributed questionnaires to the sample group through both physical and digital channels. All collected responses were thoroughly screened for completeness and consistency prior to the statistical analysis phase.

Data Analysis

Quantitative data were processed and analyzed using statistical software packages, including SPSS and Microsoft Excel. Descriptive statistics, such as Percentages, were utilized for demographic profiling. Furthermore, Mean (\bar{X}) and Standard Deviation (S.D.) were calculated to assess satisfaction levels and identify key factors influencing system performance. The resulting mean scores were compared against standardized interpretation criteria to

conclude the efficacy of the newly developed Material Management System. (Mean (\bar{X}): Indicates the overall level of satisfaction. Standard deviation (S.D.): Indicates the agreement of the responses (a low S.D. means that respondents agree a great deal).)

In analyzing quantitative research data using a 5-level Likert scale, determining the criteria for interpreting the mean is very important in order to be able to conclude the satisfaction results in a clear level. Researchers often use the criteria of Best (1977) or Srisaad (2010) to calculate the intervals of the classes, with the following calculation method: Calculation formula: (highest value - lowest value) / number of classes = $(5 - 1) / 5 = 0.80$

Mean Interpretation Criteria;

Mean Range	Interpretation
4.51 – 5.00	Extremely Satisfied / Highest
3.51 – 4.50	Very Satisfied / High
2.51 – 3.50	Moderately Satisfied / Moderate
1.51 – 2.50	Slightly Satisfied / Low
1.00 – 1.50	Least Satisfied / Lowest

The researcher interprets the calculated mean scores by categorizing the satisfaction levels into five distinct groups based on standard criteria. This classification serves as a benchmark for discussing the overall effectiveness and performance of the developed Material Management System from the perspective of the users.

RESULT

1. This research analyzes data on factors affecting the satisfaction of personnel using parcel delivery services at the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University. The researcher presents the results of the data analysis in Step 1, which involves gathering general information from 40 respondents, as follows:

Regarding gender, the majority of respondents are female, accounting for 87.50% (35 people), while males represent 12.50% (5 people). In terms of age, half of the respondents (50.00%) are between 41 and 50 years old. The remaining respondents are equally distributed between the age groups of 31–40 and 51–60, with each group representing 25.00%.

In terms of occupation, a significant majority are permanent university employees (75.00%), followed by temporary university employees (17.50%) and civil servants (7.50%). Regarding educational attainment, more than half of the sample group hold a Master's degree (57.50%), followed by those with a Bachelor's degree (25.00%) and a Doctoral degree (17.50%), respectively. These demographic characteristics provide a comprehensive profile of the primary users of the Material Management System within the faculty.

2. Analysis of Factors Affecting the Development of the Materials Management System

This section presents the results of an analysis of the opinions of personnel regarding the current materials management system in the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University. The analysis is conducted item by item and as an overall picture, as shown in Table 2.

Table 2 Opinions on the current material management system**(N = 40)**

Feedback form	\bar{X}	S.D.	Level of opinion
1. The material management system has clear and standardized procedures	3.63	0.7	High
2. Material storage is organized and easy to audit	3.25	0.66	Moderate
3. Material requisition is convenient, fast, and transparent	4.00	0.87	High
4. Personnel have knowledge and understanding of material management regulations and procedures	4.38	0.85	High
Overall	3.81	0.85	High

Based on the analysis in Table 2, the overall opinion of the personnel toward the current material management system of the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University, is at a **High** level, with a total mean (\bar{X}) of 3.81 and a standard deviation (S.D.) of 0.85.

When considering each item individually, the highest mean score was found in “**Personnel have knowledge and understanding of material management regulations and procedures,**” with a mean of 4.38 (High). This was followed by “**Material requisition is convenient, fast, and transparent**” at 4.00 (High) and “**The material management system has clear and standardized procedures**” at 3.63 (High). In contrast, the item with the lowest mean score was “**Material storage is organized and easy to audit,**” with a mean of 3.25, which is categorized at a **Moderate** level.

Conversely, the **lowest mean score** was recorded for **organized material storage and ease of auditing** ($\bar{X} = 3.25$, S.D. = 0.66), which falls within the “**Moderate**” level. This finding implies that while the overall system is functional, there is a strategic need to improve the “Physical and Digital Storage System” to enhance orderliness and auditability. Addressing this specific area will be crucial for the successful development of a more agile and accurate material management framework for the faculty.

3. Results of the Needs Analysis for Developing a Material Management System

This section analyzes the needs of personnel regarding the development of a material management system for the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University, in order to determine the direction for improving the system to meet the actual needs of users, as shown in Table 3.

Table 3 Opinions on the Needs for Developing a Material Management System**(N=40)**

Feedback form	\bar{X}	S.D.	Level of opinion
1. You want information technology to be used to manage the materials system.	3.63	0.70	Moderate
2. Which area of the system do you think needs the most development?			
- Materials storage	98.2	91.0	Moderate

Feedback form	\bar{X}	S.D.	Level of opinion
- Materials issuance	00.4	71.0	High
- Materials inspection	00.4	87.0	High
- Materials reporting	63.2	99.0	Moderate
- Personnel training	25.4	83.0	High
Overall	65.3	97.0	High

Table 3 illustrates the analysis of requirements for developing the material management system. The findings reveal that the **overall demand for system development is at a “High” level** ($\bar{X} = 3.65$, S.D. = 0.97). When analyzing individual aspects, several key priorities emerged.

The **highest priority** identified by respondents is **personnel training** ($\bar{X} = 4.25$, S.D. = 0.83), which ranks at a “High” level. This underscores that human capital development and the enhancement of regulatory literacy are perceived as the most critical factors for successful system implementation. Following closely with high demand are the **material requisition process** and **material auditing** ($\bar{X} = 4.00$ for both), indicating a strong organizational need for a system that promotes operational agility, transparency, and accurate traceability.

Conversely, the integration of general information technology, material storage, and material reporting were rated at a **“Moderate” level**. Notably, **material reporting** received the lowest mean score ($\bar{X} = 2.63$, S.D. = 0.99). In conclusion, the research suggests that the faculty’s strategic roadmap for material management should prioritize user capacity building and the optimization of requisition and auditing workflows to ensure the system’s long-term effectiveness and alignment with staff needs.

CONCLUSION

The research on the development of the Material Management System for the Faculty of Humanities and Social Sciences, Suan Sunandha Rajabhat University, yields several comprehensive conclusions as follows:

1. Demographic Context and User Profile

The empirical findings indicate that the primary users consist of 40 faculty members and staff, predominantly female (87.50%), holding Master’s degrees (57.50%), and belonging to the experienced professional age group of 41-50 years (50.00%). Most are permanent university employees. This demographic profile suggests a high level of academic background and professional maturity, which serves as a critical facilitator for successful organizational digital transformation and technology adoption.

2. Effectiveness of the Current Management Framework

The overall satisfaction with the current material management system is rated at a “High” level ($\bar{X} = 3.81$, S.D. = 0.85). A key institutional strength lies in personnel competency, specifically their profound understanding of supply regulations and procedures ($\bar{X} = 4.38$), which ensures transparency and accountability. However, the study identifies a significant operational bottleneck in physical material storage, which received the lowest satisfaction score at a “Moderate” level ($\bar{X} = 3.25$). This indicates a structural gap where manual-based methods

fail to maintain optimal organization and rapid data retrieval.

3. Strategic Requirements for Future System Development

Regarding the roadmap for future development, the demand for system enhancement is rated at a “High” level ($\bar{X} = 3.65$). Interestingly, the primary focus is not solely on technical infrastructure but on human capital development, with “Personnel Training” being the top priority ($\bar{X} = 4.25$). Users also emphasized the need for optimizing requisition and auditing processes ($\bar{X} = 4.00$) to foster greater operational agility. While material reporting and storage were ranked at a moderate level of demand, they remain essential components that must be addressed to create an integrated, end-to-end digital material management ecosystem.

DISCUSSION

The research findings regarding the development of the Material Management System for the Faculty of Humanities and Social Sciences can be discussed through several academic lenses:

1. Synergy between Competency and Technology Adoption

While personnel possess high regulatory knowledge ($\bar{X} = 4.38$), their demand for training is the highest priority ($\bar{X} = 4.25$). This phenomenon aligns with the Technology Acceptance Model (TAM) developed by Davis (1989), which suggests that “Perceived Ease of Use” is a crucial determinant of system adoption. High existing knowledge provides a foundation, but digital transition requires specialized skills. This also correlates with the HOT-fit Framework (Yusof et al., 2006), emphasizing that the success of an IS system depends on the harmonious integration of Human, Organizational, and Technological factors, and training and awareness are crucial: understanding significantly increases after training for online academic services; large shares are willing to use e-learning if made visible and supported. (Kongprasert et al., 2023).

2. Operational Excellence and Regulatory Compliance

The high scores for requisition and auditing transparency ($\bar{X} = 4.00$) reflect the faculty's alignment with the Government Procurement and Supplies Management Act B.E. 2560 (2017). Enhancing disbursement and auditing processes under good governance principles emphasizes transparency, accountability, participation, and effectiveness, which helps build credibility and sustainability in budget and resource management (Rusyunizal & Karim, 2025). The adoption of information technology and an IT governance framework significantly improves the efficiency of external audits and reduces costs (Roustom et al., 2025). The emphasis on auditability resonates with Heizer et al.'s (2017) principles of inventory management, which argue that effective systems must ensure high accuracy and real-time visibility to minimize budget wastage and enhance organizational accountability.

3. Addressing the Storage Efficiency Gap

The moderate satisfaction level in material storage ($\bar{X} = 3.25$) highlights a structural weakness. According to Tompkins et al. (2010) in Facilities Planning, efficient material flow is predicated on organized spatial management. Integrating location tracking or QR code technology within the new system would address these physical bottlenecks, transforming the faculty's storage into a more agile and verifiable digital ecosystem.

4. Impact of Demographics on Innovation

The sample group, predominantly aged 41–50 with Master’s degrees, represents a high-experience demographic. Their inclination towards training suggests a calculated approach to innovation. As per Rogers’ (2003) Diffusion of Innovations, this group will likely adopt the system if it demonstrates clear “Relative Advantage”—specifically, if it significantly reduces redundant administrative workloads.

Suggestions

1. **Practical Application:** Organize hands-on workshops and integrate QR Code/Barcode technologies to address storage and auditing inefficiencies.
2. **Future Research:** Conduct qualitative interviews to explore reporting issues and perform a comparative study on operational speed before and after system implementation.

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