Research Article

Model to Evaluate Hierarchical Organizations Performance in Implementing Higher Education Information Systems

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Abstract

Adopting and successfully implementing information systems in higher education is essential for improving administrative processes and communication and supporting academic activities. However, the hierarchical nature of such organizations poses unique challenges that must be addressed for the effective adoption of information systems. This study proposes a framework to assess the performance of hierarchical organizations in effectively implementing information systems in universities. The proposed framework evaluates various dimensions that influence the successful adoption of information systems in hierarchical organizations. This dimension includes leadership support, communication channels, organizational culture, and resource allocation. The conceptual framework provides a holistic assessment of an institution's ability to effectively adopt and utilize information systems. A structural equation model and Smart Partial Least Squares (Smart PLS) were used for data analysis. Using a sample of 121 respondents, data were collected using a questionnaire instrument using the Google Form link at Banten Province higher education leadership levels. This framework provides a structured approach to assessing the performance of hierarchical organizations in terms of the adoption of information system success in higher education institutions. By leveraging this framework, institutions can enhance their information system adoption processes and ultimately improve their effectiveness in using information systems for academic and administrative purposes. The results indicate that hierarchical organizations can optimize performance when implementing higher education information systems, focusing not only on the technical aspects of the system but also on organizational culture, communication, and leadership involvement.

Keywords: Framework; Hierarchical Organization; Higher Education; Information System Success; SEM-Pls

INTRODUCTION

In the current digital era, effective adoption and use of information systems (IS) are vital for the success and competitiveness of higher education institutions (HEIs). These systems enable institutions to streamline administrative processes, enhance teaching and learning experiences, and improve organizational performance. However, IS adoption and success in HEIs often involve complex hierarchical structures, which pose unique challenges in assessing and measuring performance.

This study presents an extensive model for assessing the performance of hierarchical organizations in IS adoption within the context of higher education institutions. The proposed model aims to provide a structured approach for evaluating the effectiveness and efficiency of IS adoption across various levels of the organizational hierarchy, including top management, middle management, and end users.

Improving information systems is crucial for a higher education institution to compete and survive in the world of education (Kurniawati et al., 2021; Yulianti et al., 2022). Each plays an asynchronous role in organizational hierarchies and management operations (Angriani et al., 2020; Ilham et al., 2021; Zhang & Yu, 2022). Information systems are also a crucial research topic and

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information systems have been narrowly defined in terms of databases (Chin et al., 2020). Information technology adds value to an organization and provides practical information that explains its success (Rajabalee & Santally, 2021). The use of IS in higher education has become necessary (Rapanta et al., 2020; Parilla et al., 2023). If the information system in an organization has good quality, the organization will run well (Fu et al., 2022; Corpuz, 2024). Information quality is crucial for the smooth running of an institution (Azad, 2022). Research on higher education information systems is increasing along with the increasing need for information systems in tertiary instruction (D'Ambra et al., 2022; Aguenza, 2024). Previous research Al-Adwan et al. (2021) has created a model for measuring information system success that emphasizes the demand for improved, more reliable success metrics. Using the DeLone and McLean IS Success models is a technique to evaluate the effectiveness of an information systems model (Çelik & Ayaz, 2022), which will be considered in the DeLone and McLean Framework Model, which can be utilized to assess and quantify the factors influencing information system success in organizations.

Although the acceptance of information systems (IS) in higher education institutions (HEIs) has been extensively studied, a notable research gap exists regarding assessing performance in hierarchical organizations, specifically within the context of IS adoption in HEIs. Existing research tends to focus on overall IS success or specific aspects of IS adoption without considering the hierarchical structure and its influence on IS adoption outcomes (Qasem et al., 2019). The research gap lies in the lack of a comprehensive model that addresses the unique challenges and complexities of assessing IS adoption success in hierarchical organizations within the context of higher education institutions. Existing frameworks and models focus on technical aspects, user satisfaction, and overall organizational impact rather than considering the specific roles and responsibilities of different hierarchical levels within HEIs (Sengik et al., 2022). The use and adoption of IS in higher education worldwide have become increasingly recognized (de Wit & Altbach, 2021). The success of an information system used in an organization is a crucial mission of an organization (Tallon et al., 2019).

Additionally, while some research (Leso & Cortimiglia, 2022) has explored the effect of top management support and end user involvement on IS adoption success, a lack of studies has comprehensively examined the interaction between top management, middle management, and end users in a hierarchical structure. Understanding how these levels interact and influence IS adoption outcomes is crucial for developing a comprehensive evaluation model. Organizational hierarchy support is needed to ensure that a system receives the funding and resources it requires to be successful (Mikalef & Gupta, 2021). Corporate hierarchy support is key to successfully implementing an information system (Sony & Naik, 2020). Top management support can raise the quality level of knowledge and affect individual commitment to an organization (Muhammed & Zaim, 2020).

The conflict in the execution of information systems is how to assess the interaction of organizational culture in the corporate hierarchy with the effectiveness of using information systems in tertiary institutions. Therefore, this study proposes an interdependence model between temporal and causal categories, where temporal relationships influence causal relationships so that an event that occurs first is seen as the cause of another event that happens later, and the time sequence between these events can be clearly understood. Thus, this study provides an overall picture of organizational hierarchical culture based on the success rate of higher education information system assessments. Researchers adapt, adopt, and combine the two examples into a new model explicitly used in the prosperous development and fulfillment of information systems. In connection with the above objectives, two research questions were then asked to guide the implementation of the research:

1. RQ1: What is the most effective model for evaluating the performance of hierarchical organizations in the adoption of higher education information systems?
2. RQ2: How can we integrate the information system adoption model in higher education institutions?

LITERATURE REVIEW

The DeLone and McLean Information Systems Success Model

Known as the parsimony model, a good parsimony model is comprehensive but uncomplicated (Marsh et al., 2020) that uses the concepts and findings of earlier research that DeLone and McLean have studied (DeLone & McLean, 2003). Constructed a parsimony model known as the DeLone and McLean Information Systems Success Model (D&M IS Success Model) (DeLone & McLean, 1992), as illustrated in Figure 1.

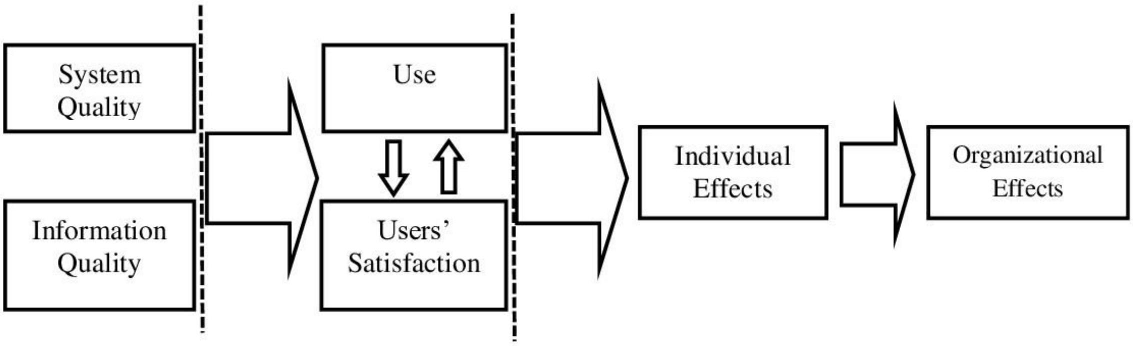

Figure 1. Model for IS Success DeLone and McLean 1992 (DeLone & McLean, 1992)

The reliability of the six success indicators for information systems is demonstrated in the DeLone and McLean models. These are the six measurement components of this model: 1) System Quality, 2) Information Quality, 3) Use, 4) User Satisfaction, 5) Individual effects, and 6) Organizational effects. The basis for this success model lies in the processes and constructive relationships among the model dimensions. These six factors determining whether an information system is successful are measured collectively in this model rather than individually, with each element influencing the others. This procedural and causal model explains how the quality of the system and the quality of the information independently and jointly affect use and user satisfaction. User satisfaction can be positively or negatively impacted by usage volume. Use and user satisfaction influence individual impacts, which influence organizational effects.

Measurement of Information System Success

The DeLone and McLean information system success model proposes that system quality measures technical success, information quality measures semantic success, and use, user satisfaction, individual impact, and organizational impact assess success effectiveness (DeLone & McLean, 1992). Many measurements have been used to evaluate the effectiveness of information systems (Dina et al., 2019; Firmansyah et al., 2020; Haerani et al., 2022; Yuniarto & Herdiana, 2018). However, no one measurement is better than another. The choice of measurements must take into account several factors, including the goals of the study, the environment of the organization to which it will use, information system components, independent variables used to gauge its success, the research methodology, and the level of analysis, at the individual, organizational, or societal level (Khayer et al., 2020). In the DeLone and McLean model, six primary dimensions are used to measure the factors that determine whether an information system is thriving: system quality, information quality, service quality, system utilization, user satisfaction, and net benefits (DeLone & McLean, 2003). The Delone and Mclean model is successful because it is a simple model and is often used to test information systems, particularly to determine how successful the system under study is (Sardjono et al., 2022). This modeling approach aligns with (DeLone & McLean, 2003), explaining that many models are developed according to previous theories rather than reality.

Information Systems in Higher Education Challenges: Adoption and Utilization in Higher Education Institutions (HEIs)

Information Systems (IS) play a vital role in improving the efficiency, transparency, and quality of management in Higher Education Institutions (HEIs). However, the adoption and use of IS in HEIs face several challenges that affect the following are some of the major challenges faced by HEIs:

1. Resistance to Change
   One of the biggest challenges in IS adoption is resistance from internal users such as faculty, staff, and students (Syed et al., 2021). Many are reluctant to abandon manual systems or old technologies because they are used to them, even though new technologies offer significant benefits. These benefits, if effectively communicated, can inspire optimism and help overcome resistance. Without effective change management support, resistance can slow down IS adoption.
2. Budget and Resource Constraints
   IS implementation requires significant investment, including software, hardware, training, and system maintenance costs (Setyowati et al., 2021). Many higher education institutions need more money to allocate adequate funds for IS, making it difficult to allocate adequate funds for IS. In addition, a lack of qualified IT staff and inadequate technology infrastructure are additional barriers.
3. Lack of technological competence among users
   End users, including administrative staff, lecturers, and students, often have varying levels of technological competence. A lack of adequate training and technical support results in less than optimal IS use (Neelima et al., 2024). Institutions must provide ongoing training to allow users to use the system effectively (Schuetz & Venkatesh, 2020).
4. Change Management and Organizational Culture
   Stakeholders are key in the adoption of IS (Journeault et al., 2021). However, many HEIs face challenges in engaging stakeholders at all levels, which is a critical aspect of an effective strategy for the cultural change needed for successful IS adoption. Clear communication of the benefits of the new system is equally vital.
5. Regulatory Changes and Compliance
   Higher education is governed by many regulations, both by the government and accreditation bodies. The IS must be able to follow applicable regulatory changes, including accreditation, financial management, and academic data collection (Yuhertiana et al., 2020). Failure by an IS to meet regulatory requirements can result in fines or loss of accreditation status (Fakunle et al., 2020).

The adoption and use of Information Systems in HEIs offers a great opportunity to increase efficiency, accelerate data-driven decision-making, and improve the quality of student service. Strategies that include effective change management, ongoing training and adequate technical support are essential to ensure the success of IS implementation in HEIs.

Hypothesis

H1: A more decentralized hierarchical organizational structure can improve the performance of implementing higher education information systems.

A decentralized organizational structure distributes decision-making authority across various levels rather than concentrating it on the top (Joseph & Gaba, 2020). This allows for greater autonomy and flexibility at lower levels, which could be beneficial in higher education contexts. Implementing an information system in higher education involves multiple stakeholders: faculty, administration students, and technical teams.

H2: Active top management involvement in information system implementation increases the success of higher education information system implementation.

Active top management involvement is a key factor in the successful implementation of higher education information systems (Errida & Lotfi, 2021). Strategic oversight, resource allocation, influence on organizational culture, and ability to resolve conflicts are critical to ensuring that the system is implemented effectively and aligns with the institution's overall goals. Without their involvement, projects are more likely to face delays, resource constraints, or resistance from stakeholders, potentially leading to failure or underperformance of the system (Shabir, 2023).

H3: The level of adoption of new technology in hierarchical organizations positively affects the performance of higher education information systems.

The level of adoption of new technology in hierarchical organizations has a direct and positive impact on the performance of higher education information systems (Menon & Suresh, 2021). By embracing modern technology, universities can improve their efficiency, scalability, user experience, and innovation, all of which contribute to better performance (Sharma & Sharma, 2021). However, challenges such as resistance to change and resource limitations must be carefully managed to realize these benefits (Herceg et al., 2020).

H4: Communication and coordination between units in a hierarchical organization significantly influence the success of implementing HE information systems.

In hierarchical organizations, such as universities, clear communication and effective coordination across departments are essential for the smooth implementation of HEIS (Skoumpopoulou & Robson, 2020). Effective communication helps ensure that all units have a shared vision of what the system achieves and how it will benefit the institution (Kalogiannidis, 2020). When unit communication is strong, expectations regarding roles, responsibilities, and outcomes are clearly defined (Jankelová & Joniaková, 2021). This minimizes misunderstandings and sets the groundwork for collaborative efforts toward successful system implementation.

RESEARCH METHOD

Research Design

The study is quantitative and explains using specific instruments. The mechanism employed in this study is the survey method to obtain data regarding Cameron's theory and the success of the DeLone and McLean adoption model. Quantitative research involves choosing a study topic, identifying difficulties, choosing a matrix to measure quantitatively, constructing test instruments, running tests, interpreting data quantitatively, and developing research findings. The stages of the research findings, such as Figure 2.

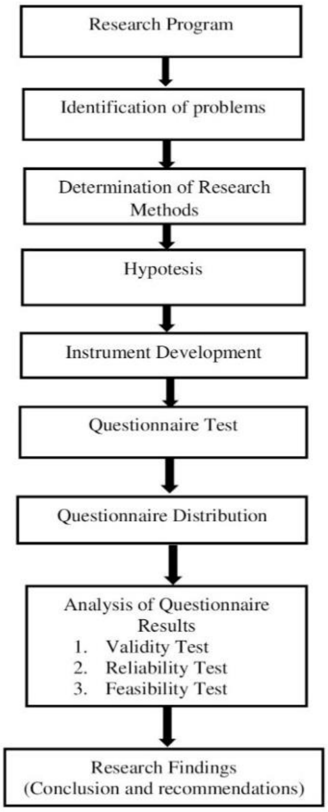

Figure 2. Analysis Flow

The description of the research shown in Figure 2 phase can be converted into research objects by identifying the issues that will be investigated in this investigation, where the research that becomes the object of this research is the performance of the hierarchical organization in information system adoption. Then, the issue by identifying or characterizing the current existing problem. The hypothesis is based on tentative assumptions that the researcher will test several variables.

Data Collection

Primary and secondary data were used in this study. A questionnaire was used to collect most of the data instrument using Google Forms at the level of higher education leaders in Banten Province. The questionnaire was compiled from Vankatest's research and has a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree' (Abbas, 2020). A sample of 121 participants was used in this investigation through a non-probability convenience sampling technique from 30 universities in the region. Secondary data were obtained from documentation and literature studies. The primary method of data collection is questionnaires. The questionnaire questions were adapted from relevant previous research. The questionnaire results will be translated into figures, tables, statistical analyses, descriptions, and conclusions (Mardiana et al., 2018). Validity testing was carried out before testing the questions on the research subjects (Tang et al., 2020).

Data Analysis

Data analysis used the structural equation modeling (SEM) technique with Smart PLS 3.0. Smart PLS is an analytical tool to measure outer and structural models (Nasution et al., 2020). Outer Model testing includes the Validity Test and Reliability Test, while the Inner Model is a continuation test for predicting cause-and-effect relationships between variables tested in the model (Natasia et al., 2021). SEM-PLS still has two assessment models; the outer or measurement model and the inner assessment or structural model (Lin et al., 2020; Sarstedt & Cheah, 2019). Due to two key benefits, SEM is increasingly used for data analysis (Sarstedt & Cheah, 2019) namely: (1) SEM can evaluate sophisticated research models simultaneously, and (2) Measurement error is taken into account, and variables that cannot be measured exclusively are analyzed using SEM. SEM-PLS is also a causal model approach that aims to maximize variance and latent predictor variables (Hair et al., 2018). Partial Least Square for Structural Equation Modeling (PLS-SEM) model was used for data analysis because PLS does not require normally distributed data (Civelek, 2018).

Proposed Research Framework

The proposed conceptual structure is based on combining and reformulating theoretical models (Cameron & Sine, 1999). The proposed study form is illustrated in Figure 3.

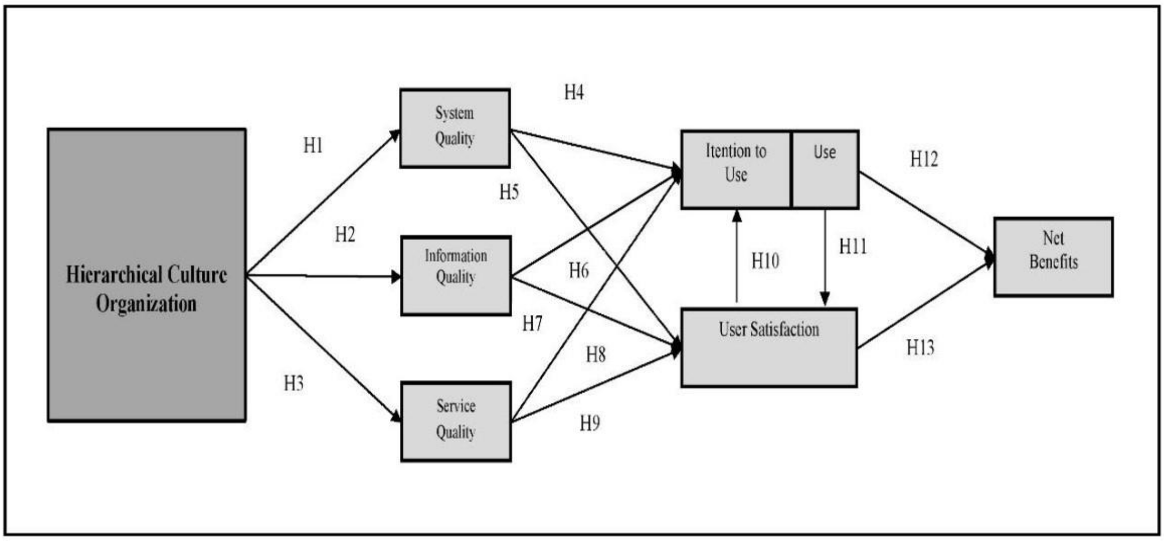

Figure 3. Proposed Research Model

Figure 3 arranged according to the level of organizational readiness to implement and use information systems in tertiary institutions so that institutions can be considered ready to use information systems. The model obtained is based on merging organizational hierarchies Cameron and Sine (1999), and model adoption DeLone and McLean (2003), describe the interactions between the research variables (Luo et al., 2022). Based on Figure 3, this research model comprises eight variables and 13 relational hypotheses. The proposed research model will explore the effectiveness of organizational hierarchy, its adoption, and the successful application of the IS model in the context of higher education institutions. The main constructions in this investigation are summarized in Table 1.

Table 1. Proposed model of the main construction

No	Variable	Definition	Indicator	Symbol
1	Hierarchical Organization Culture (HCO)	The size by which organizational hierarchy influences the implementation of information systems.	Control	HCO1
			Monitoring	HCO2
			Involve	HCO3
			Punctuality	HCO4
			Culture	HCO5
2	System Quality (SYQ)	Measuring the quality of the system itself, both software and hardware.	Easy to use	SYQ1
			Maintenance	SYQ2
			Response time	SYQ3
			Utility	SYQ4
			Security	SYQ5
3	Information Quality (IFQ)	The quality of information is subjectively measured by users.	Accuracy	IFQ1
			Punctuality	IFQ2
			Completeness	IFQ3
			Consistency	IFQ4
			Relevance	IFQ5
4	Quality of Service (SVQ)	Comparison of user expectations with the actual service perceptions they receive.	Responsiveness	SVQ1
			Flexibility	SVQ2
			Utility	SVQ3
			Security	SVQ4
			Extension	SVQ5
5	Intention of Use (ITU)	The use of information, and the use of the information system itself.	Perceived usefulness	ITU1
			Extrinsic Motivation	ITU2
			Perfect for work	ITU3
			The relative advantage	ITU4
			Expected results	ITU5
6	Usage (USE)	The use of the system in fulfilling the services required by users	Frequency of use	USE1
			Intensity of use	USE2
			Usage rate	USE3
			Specificity of use	USE4

No	Variable	Definition	Indicator	Symbol
			Proper use	USE5
7	User Satisfaction (USF)	The response and feedback that appear from the user after using the information system.	Efficiency	USF1
			Effectiveness	USF2
			Flexibility	USF3
			Enough	USF4
			Overall satisfaction	USF5
8	Net Benefit (NBF)	Results or benefits felt by individuals and organizations after implementing information systems	Continuity of use	NBF1
			Continuation of services provided	NBF2
			Continuation of use	NBF3
			System continuity	NBF4
			Promote services	NBF5

FINDINGS AND DISCUSSION

Validity Test

A validity test helps determine the reliability or applicability of the questionnaire used to gauge and collect data from respondents. Validity is determined by comparing the computed r-value to the r table; If the calculated r-value> r table is valid; otherwise, the estimated r-value < r table is invalid. This study first uses the validity test to assess the instrument's precision before being conducted. Each indication was considered valid if its outer loading value was greater than 0.70. However, a loading value of 0.50–0.60 is still acceptable for scale development research. Table 2 shows the outer loading results in this study.

Table 2. Outer Loadings

	HCO	IFQ	ITU	NBF	SVQ	SYQ	USE	USF
HCO1	**0.825**							
HCO2	**0.813**							
HCO3	**0.782**							
HCO4	**0.753**							
HCO5	**0.711**							
IFQ1		**0.768**						
IFQ2		**0.891**						
IFQ3		**0.886**						
IFQ4		**0.895**						
IFQ5		**0.812**						
ITU1			**0.750**					
ITU2			**0.865**					
ITU3			**0.889**					
ITU4			**0.835**					

	HCO	IFQ	ITU	NBF	SVQ	SYQ	USE	USF
ITU5			**0.844**					
NBF1				**0.832**				
NBF2				**0.733**				
NBF3				**0.756**				
NBF4				**0.792**				
NBF5				**0.826**				
SVQ1					**0.755**			
SVQ2					**0.862**			
SVQ3					**0.803**			
SVQ4					**0.818**			
SVQ5					**0.798**			
SYQ1						**0.717**		
SYQ2						**0.763**		
SYQ3						**0.826**		
SYQ4						**0.813**		
SYQ5						**0.770**		
USE1							**0.718**	
USE2							**0.753**	
USE3							**0.755**	
USE4							**0.761**	
USE5							**0.863**	
USF1								**0.850**
USF2								**0.799**
USF3								**0.814**
USF4								**0.811**
USF5								**0.849**

Based on the above table, we can see that all latent variable indicators have outer loading values greater than 0,70; thus, they can be considered valid. Figure 4 shows the construction of the external model analysis diagram.

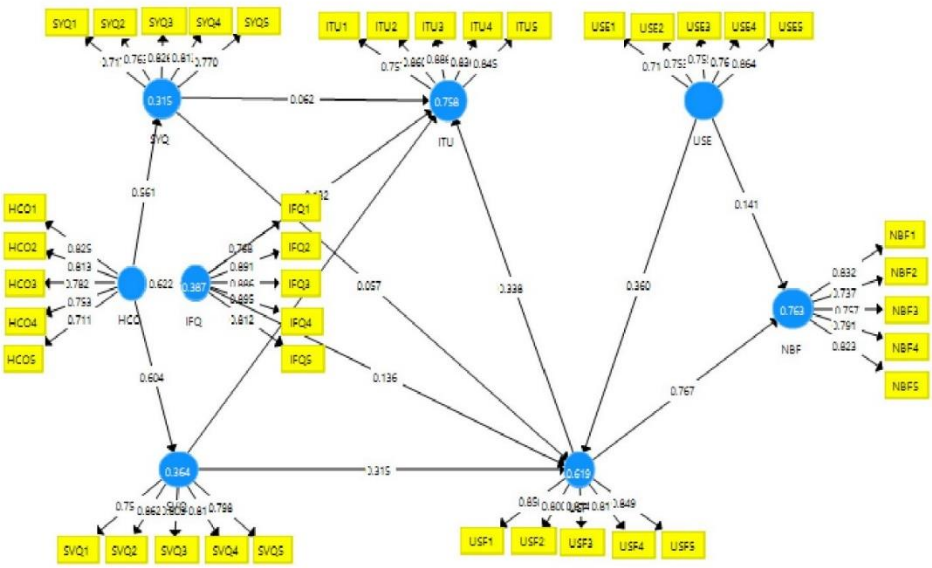

Figure 4. Outer Model Analysis

Reliability Test

All research-based scientific findings are presented in the Results and Discussion sections. This part is required to offer a scientific justification that logically explains how the results were attained, and the results are precisely documented, comprehensive, detailed, integrated, systematic, and continuous. Table 3 summarizes the findings of Cronbach's alpha calculations:

Table 3. Construct reliability

	Composite Reliability	Cronbach's Alpha	Average Variance Extracted (AVE)	Results
HCO	0.884	0.836	0.605	Reliable
IFQ	0.929	0.904	0.726	Reliable
ITU	0.922	0.893	0.702	Reliable
NBF	0.892	0.848	0.622	Reliable
SVQ	0.904	0.867	0.653	Reliable
SYQ	0.885	0.838	0.607	Reliable
USE	0.880	0.830	0.596	Reliable
USF	0.914	0.883	0.681	Reliable

Reliability (AVE) was calculated using the values of composite reliability and average variance extracted. The composite reliability is deemed dependable when its reliability is 0.7. An excellent value for the AVE is 0.5. The findings in Table 3 above show that all variables have composite reliability values greater than 0.70, which already fulfills the reliability criterion, and an average retrieved variance value greater than 0.50 is good. As a result, all observed variables are reliable and help measure latent variables.

Coefficient of Determination Test (R square)

The R-squared values represent the degrees of external and endogenous determination. The level of decision will be higher if the R-Square adjusted is larger. The details of the R-squared items are presented in Table 4.

Table 4. R Square

	R Square	R Squared Adjustment
IFQ	0.387	0.382
ITU	0.757	0.751
NBF	0.786	0.782
SVQ	0.364	0.360
SYQ	0.315	0.310
USF	0.619	0.609

The R-squared corrected value of the IFQ variable is 0.387, as shown in Table 4. This indicates that quality information has a 38.7% influence on decision making. The intention of use has a 75.7% influence, according to the R-squared corrected value for the ITU variable of 0.757. The net benefit effect percentage is 78.6%, according to the fixed R-squared value of the NBF variable, which is 0.78. The 36.4% influence of service quality is shown by the SVQ variables R (squared adjusted value of 0.364). The R-squared adjusted value for the SYQ variable was 0.315, indicating a 31.5% influence on system quality. Additionally, the adjusted value of the USF variable R squared is 0.619. This suggests that user satisfaction has a 61.9% influence on the USF.

Hypothesis Test

Smart PLS 3.0 performs bootstrapping if the data satisfy the measurement conditions. The t values obtained from the computation of the T statistic are compared to the t table in this test. If the T statistic value is less than or equal to the value of the t table, the null hypothesis holds; otherwise, it is rejected. The results of the hypothesis testing are displayed in the following Table 5:

Table 5. Path Coefficient Value

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Results
HCO -> IFQ	0.622	0.618	0.093	6.709	0.000	Significant
HCO -> SVQ	0.604	0.600	0.089	6.768	0.000	Significant
HCO -> SYQ	0.561	0.564	0.084	6.666	0.000	Significant
IFQ -> ITU	0.132	0.150	0.141	0.937	0.349	Not Significant
IFQ -> USF	0.136	0.132	0.182	0.746	0.456	Not Significant
SVQ -> ITU	0.422	0.391	0.148	2.845	0.005	Significant
SVQ -> USF	0.315	0.297	0.108	2.927	0.004	Significant
SYQ -> ITU	0.062	0.083	0.079	0.793	0.428	Not Significant
SYQ -> USF	0.057	0.076	0.116	0.495	0.621	Not Significant
USE -> NBF	0.141	0.150	0.054	2.587	0.010	Significant
USE -> USF	0.360	0.366	0.071	5.077	0.000	Significant
USF -> ITU	0.338	0.330	0.065	5.218	0.000	Significant
USF -> NBF	0.767	0.758	0.061	12.521	0.000	Significant

The path coefficient results obtained above yielded positive values for all variable interactions. The highest value is 0.767 for the interaction between USF and NBF variables, which is 0.767. In contrast, the interaction between the SYQ and USF variables has the lowest path coefficient of 0,057.

Discussion

The framework for assessing the performance of hierarchical organizations in adopting higher education information systems is a critical tool for evaluating the effectiveness of implementing technology within these complex institutions (Kheybari et al., 2020).The framework for assessing the performance of hierarchical organizations in adopting higher education information systems is a comprehensive and structured approach to ensure successful implementation (Ali et al., 2021). This approach addresses the unique challenges and dynamics of hierarchical organizational structures and provides: A roadmap for making informed decisions; Maximizing the benefits of technology; Achieving the institution's goals. This framework is not a one-time assessment but a continuous process of evaluation and improvement (Dumitru et al., 2020). From the perspective of developing information system models (Yuniarto & Herdiana, 2018; Firmansyah et al., 2020), this research highlights two highlighted points, namely, the most effective framework for assessing the performance of hierarchical organizations (RQ1) and integrating the information system adoption model in higher education institutions (RQ2), identifying what has been explored, and identifying research gaps.

First, the choice of the most effective framework for assessing the performance of hierarchical organizations in adopting higher education information systems may vary depending on the specific needs and context of the institution. DeLone and McLean's information systems (IS) success model attempts to provide a comprehensive understanding of IS success by identifying and explaining the relationships among the most critical dimensions of success. According to (Sabeh et al., 2021), this research systematically reviews, compiles, analyzes, and synthesizes DeLone and McLean model studies in the context of e-learning. The findings show that most of the studies reviewed were conducted in education. According to (Nazari-Shirkouhi et al., 2020), the importance of services provided and university activities is determined through the Balanced Scorecard (BSC) approach, and the performance assessment structure is applied based on an integrated fuzzy multi-criterion decision-making (MCDM) method. The Balanced Scorecard framework provides a holistic view of performance by considering financial perspectives, stakeholders, internal processes, and learning or growth (Lee et al., 2021). This aligns information system implementation with the organization's strategic objectives and encourages a balanced approach to performance assessment. Research conducted by Fajrillah et al. (2022) explains that company architecture must align business and information technology by mapping the best practices of the ITIL framework as a foundation and practical direction for realizing company operational services that are sustainable in growth, profit, and satisfaction. Research by (Schaefer et al., 2020) analyzed the creation of a framework for 20 information technology governance processes using COBIT and ITIL based on the similarity and objectivity of each technique.

Second, integrating an information system adoption model into higher education institutions is a complex process that involves careful planning, execution, and ongoing management (Miranda et al., 2021). Such a model is essential for enhancing the efficiency and effectiveness of operations, improving student services, and supporting academic and administrative functions. Integrating information system adoption models in higher education institutions is an ongoing process that requires careful planning, collaboration, and commitment to continuous improvement (Zuhairi et al., 2020; Jöhnk et al., 2021). This requires aligning technology with the agency's strategic goals, addressing stakeholders' needs and concerns, and continually measuring and improving performance to ensure long-term success. In addition, flexibility and adaptability are key to addressing technology and educational needs as they develop over time.

In summary, this framework allows educational institutions to systematically evaluate their readiness for and progress in adopting higher education information systems while considering the unique challenges and dynamics of hierarchical organizational structures. Provides a structured approach to ensure the successful implementation and utilization of technology to support the institution's goals and objectives.

CONCLUSION

The model presented for assessing the performance of hierarchical organizations in the successful adoption of information systems in higher education provides a systematic approach for evaluating and improving the effectiveness of information system implementation. This model addresses the unique challenges faced by hierarchical organizations in higher education institutions and offers a comprehensive set of evaluation criteria. By considering various dimensions such as leadership support, communication channels, organizational culture, and resource allocation, the model helps identify strengths and weaknesses in a hierarchical organization's ability to adopt and successfully implement information systems. This emphasizes the importance of top-down support and involvement, effective communication channels, and a conducive organizational culture for successful information system adoption. Overall, this model serves as a valuable tool for higher education institutions to assess the performance of their hierarchical organizations in successfully adopting information systems. This approach provides a structured approach to identifying strengths and weaknesses, enabling agencies to make informed decisions and implement targeted interventions to increase the adoption and use of information systems. By leveraging this model, institutions can improve their effectiveness and achieve better results when using information systems for academic and administrative purposes.

LIMITATION & FURTHER RESEARCH

Limitations and Further Research Directions for the Model to Evaluate a Hierarchical Organization's Performance in Implementing Higher Education Information systems:

Limitations

Contextual. Research on hierarchical organizational performance is limited to specific higher education contexts (e.g., universities in one country or region). This makes the results less generalizable to higher education institutions in other areas with different organizational structures, cultures, and regulations. The findings are irrelevant to institutions with flatter structures or those operating under different governance models. Future research should expand the scope of this study to other types of universities in various countries to obtain more inclusive results.

Data and Performance Measurement. Data on organizational performance often relies on quantitatively measurable metrics, such as implementation time, cost, and system adoption rates. However, many other aspects of performance, such as end-user satisfaction, teaching quality, and impact on academic processes, are qualitative and more difficult to measure. Measurements that focus only on quantitative aspects do not comprehensively describe the overall performance of the implemented education information system. Future research should develop performance measurement methods that include qualitative dimensions such as faculty and student satisfaction and the impact of the system on the educational process**.**

Influence of Organizational Culture. Organizational culture often influences hierarchical organizational structures, which can vary across higher education institutions. A culture that supports innovation and change can accelerate information system implementation, whereas a more conservative or bureaucratic culture can slow down implementation. The framework for evaluating performance does not fully consider the influence of organizational culture, which is a key factor in successful information system implementation. Future research should consider the impact of organizational culture and how these aspects affect the success of information system implementation across universities.

Technology and Infrastructure Constraints, Some higher education institutions have different technological infrastructures. Differences in available technology and infrastructure-supporting information systems can affect implementation effectiveness and efficiency. The results of this study do not reflect the situation in institutions with infrastructure constraints, especially in developing countries. Future research can examine how organizational performance in implementing information systems can be improved in environments with limited technology infrastructure.

Role of Human Resources, This study ignores the importance of human factors, such as staff competence, training, and end-user involvement, in information system implementation. System performance is greatly influenced by how human resources in a hierarchical organization support or hinder implementation. These aspects are not considered; the evaluation of organizational performance can be inaccurate because human factors play a significant role in the success of system implementation. Future research should focus on training, skill development, and user involvement in information system implementation.

Further Research Directions:

Development of a More Flexible and Adaptive Model, Future research can develop a more flexible and adaptable evaluation model for different types of higher education institutions with different organizational structures, cultures, and resources. This allows the model to be applied to various situations with more reliable results.

Qualitative Research to Explore Social and Cultural Factors, Future research should explore the social and cultural factors that influence the implementation of higher education information systems through qualitative studies. This research can provide deeper insights into qualitative factors such as user satisfaction, resistance to change, and leadership in hierarchical organizational structures.

Use of Big Data and Analytics for Performance Measurement, Future research can use big data and analytics tools to evaluate the performance of information system implementations more comprehensively. With big data, researchers can observe system usage patterns, user satisfaction levels, and the impact of a system on the university's academic and administrative processes.

Cross-Country or Cross-Cultural Case Studies, Cross-country or cross-cultural studies can provide greater insight into the implementation of information systems in higher education institutions with different hierarchical organizational structures. It can also help identify local factors that support or hinder system implementation.

Long-Term Research, To determine the full impact of information systems implementation in higher education, future research should adopt a longitudinal design to evaluate changes in performance over the long term. This could include aspects such as changes in organizational culture, operational efficiency, and improvements in the quality of education over time.

By understanding the current limitations and focusing on suggestions for future research, performance evaluation models for information systems in higher education institutions can be improved to be more relevant, adaptive, and able to capture complex realities.

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