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A Data Literacy and AI Readiness-Based Maturity Model For Managerial Information Systems: Evidence From A University Executive Information System

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ABSTRACT

The research seeks to come up with a model for MIS maturity based on data literacy and AI readiness in the implementation of an executive information system (EIS) in the university. It applies a quantitative method involving PLS-SEM for analyzing data collected from users of the executive information system in university. From the results, it is evident that data literacy and AI readiness are positively and significantly associated with the maturity of the management information system. Data literacy appears to be more powerful as the ability of users to interpret data is crucial for achieving information system maturity. AI readiness serves as a supportive factor since it facilitates the successful implementation of technology in information systems but cannot enhance system maturity on its own. This work offers practical suggestions for the university regarding how it should improve information system maturity through AI readiness and data literacy.

Introduction

In the current digital transformation era, information systems are being utilized by all modern organizations to support their processes of strategic decision-making (Saremi, 2025). Thus, the development of information systems that are capable of supporting organizational leaders with strategic information has emerged as a crucial issue. Considering that, in complex organizations like universities, organizational leaders are desperate for fast, accurate, and integrated information to be able to monitor organizational performance and formulate appropriate organizational policies (Bristol-Alagbariya et al., 2022).

Executive Information System (EIS) is one of the information systems that can be utilized to meet organizational leaders' needs for monitoring different organizational performance indicators, as EIS information systems are capable of displaying information in the form of information systems' dashboards (Suryana, 2017).

In the context of higher education, the application of EIS is becoming more and more important because the management of higher education institutions involves a number of complex academic, administrative, and managerial tasks (Croucher & Woelert, 2022). Higher education institutions need to be able to integrate different sources of information, such as student and faculty information, financial information, research

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information, and institutional performance data, in order for the organizational leaders to have a complete view of the status of the organization (Gonugunta & Leo, 2024).

Research carried out by Soegoto (2019) has found that the application of an integrated EIS in higher education can enable organizational leaders to have strategic information quickly and comprehensively, thus facilitating the process of monitoring organizational performance. In addition, research carried out by Suryana (2017) has found that EIS in higher education can support organizational leaders in monitoring academic activities and facilitating managerial decision-making.

The Universitas Komputer Indonesian (UNIKOM) has created an EIS that caters to the information requirements of the university's executives. UNIKOM's EIS combines information from both academic and administrative environments, providing key executives, from the rector down to the vice-rectors, deans, and heads of study programs, with strategic information on a single interface. The system also provides various information dashboards, which assist executives in effectively tracking activities within the organization (Suryana, 2017).

Other universities have also implemented executive information systems. However, the success of the system not only depends on technology but also on the maturity of the organization's information systems and practices, including how data is treated (Varajão et al., 2022). The Information System Maturity (ISM) model defines the stages of growth of IS use within an organization, from simple use to more in-depth integration and analysis (Hansen et al., 2024).

In addition to the maturity level of an information system, the level of understanding and utilization of information by the user is an important factor for the success of an information system implementation (Alyoussef, 2023). In today's digital world, it is a must-have capability for an individual to be able to read, interpret, analyze, and utilize information for informed decision-making (Gebre, 2022; Wolff et al., 2016).

In addition, the dynamic nature of digital technology makes it imperative for organizations to integrate Artificial Intelligence (AI) into their management information systems (Wasesa et al., 2025). AI helps organizations to improve the level of analysis for information as well as generate recommendations for informed decision-making (Zong & Guan, 2025). As such, an organization's readiness for AI, referred to as AI readiness, becomes an important factor for an organization to successfully implement digital technology (Davenport & Bean, 2018).

As can be deduced from the discussion, various researchers have conducted extensive research on Executive Information Systems, data literacy, and AI readiness. However, most of this research has been conducted separately, with little or no interlinkage between the various concepts. In this regard, most of the research on EIS has been conducted in the higher education sector, with the focus on system development, while data literacy and AI readiness have been researched more within the industrial sector. Thus, the link between data literacy and AI readiness, with regard to its implications on managerial information system maturity, with specific reference to EIS adoption in the higher education sector, remains understudied.

In this regard, the aim of this study was to establish a managerial information system maturity model based on data literacy and AI readiness with regard to the adoption of EIS, as exemplified by the UNIKOM.

Literature review

Executive Information System (EIS)

An Executive Information System refers to an electronic information system where executives get access to organizational information that is presented to them in a brief and comprehensible manner. EIS often uses dashboards and visualization of data for provision of overview of important organizational performance indicators. In the field of higher education, EIS can be useful for monitoring of educational, students', administrative and operational activities. There are findings which state that integrated EIS may help enhance organizational monitoring and facilitate management decision making (Soegoto, 2019; Suryana, 2017).

At the same time, EIS is valuable both because the technology is available and because the way how the information is integrated, interpreted and analyzed. Therefore, evaluation of EIS using the framework of information system maturity will allow us to understand the issue better.

MIS Maturity

The maturity of MIS implies the level of progress made by the organization in using managerial information systems for their internal processes and decision making. A maturity model may be understood as a series of stages of increasing capabilities from simple use to integration, analytics and decision making (Carvalho et al., 2019). In the current research, MIS Maturity is defined as a second order construct with four first-order dimensions: Data Integration, Information Quality, Analytics and Dashboard and Decision Support. These dimensions represent the progress from organizational data integration to higher levels of analytical and decision making capabilities.

Data Literacy

Data literacy is the ability to read, comprehend, analyze and use data correctly (Nurrahmawati, 2026). In light of the increasing number of data-driven operations that businesses undertake, users should have adequate skill to make sense of the data that is being produced by information systems.

In this research, Data Literacy is measured via the following three lower order constructs: Data Understanding, Data Analysis and Data Usage. The above mentioned constructs reflect the ability of users to understand data, analyze information extracted from data and use such information in making decisions.

AI Readiness

AI readiness can be defined as the degree to which the firm is ready to implement and use AI for its organizational activities. This does not pertain just to technology readiness but also organizational readiness and human competence.

The current paper understands AI Readiness in terms of three lower-level constructs: Technology Infrastructure, Organizational Readiness, and Human Resource Competence. This is because of the realization that AI requires an interaction of technology, organizational aspects, and humans. The current trends in AI capability maturity further confirm that AI implementation encompasses several organizational capabilities other than just technology (Hansen et al., 2024).

Theoretical foundation

DeLone and McLean Information Systems Success Model

The first theoretical basis of this research is represented by the DeLone and McLean Information Systems Success Model. The updated version provides an understanding of information systems success as a complex interrelated set of dimensions which include system quality, information quality, service quality, system use, user satisfaction, and net benefits (DeLone & McLean, 2003). Despite the fact that the model was designed to explain the success of information systems and not information system maturity, it still is relevant to the current research since mature information systems should ensure the provision of quality information and support organizational processes and decisions. Speaking about EIS, information quality, analytics and decision support features are examples of system development.

In order to extend this perspective, this research focuses on two capabilities that influence the development and usage of managerial information systems: Data Literacy and AI Readiness. The former is related to human capability necessary to comprehend and use the information, while the latter refers to technological, organizational and human capability to use new technologies of information systems. Thus, the current research does not consider MIS maturity only from a technological point of view but also includes human capability and organizational-technological readiness.

Socio-Technical Perspective

The second theory used to provide a conceptual basis for the maturity model is socio-technical approach that asserts the importance of taking into consideration interactions between the technological and social components in the process of analyzing information systems. Information system outputs thus cannot be considered from the standpoint of technology only but rather are formed through interaction between technological configurations, humans, organization and context.

This theoretical approach is specifically relevant to the problem of EIS implementation in higher education since EIS efficiency will depend on the level of its technological possibilities and capacity of people to understand and utilize information provided by the system. Information systems development, according to this view, is socio-technical change in which technology and organizations are interacting but not independent entities (McLeod & Doolin, 2012).

In the current model, Data Literacy stands for one of the human capabilities, whereas AI Readiness is a measure of technological, organizational and human readiness. MIS Maturity refers to organizational embodiment of these capabilities in the form of data integration, information quality, analytics and dashboards, decision support.

State of the art and research gap

Earlier research has considered the concepts of EIS, IS maturity, data literacy, and AI readiness from various perspectives (Table 1). But according to the literature review, all these research streams are developed in isolation from each other.

Table 1. Comparative Analysis of Prior Research

Researcher	Focus Research	Method	Main Finding	Research Gap
Soegoto (2019)	EIS Implementation	System development	EIS supports organizational monitoring	Does not assess maturity
Suryana (2017)	EIS Implementation	Design	Dashboard supports organizational monitoring	Does not evaluate system utilization
Varajão et al. (2022)	BI maturity model	Conceptual	Discusses BI maturity	Not specifically focused on EIS
Wolff et al. (2020)	Data literacy	Conceptual	Highlights importance of data literacy	Not directly linked to MIS maturity
Davenport & Bean (2021)	AI readiness	Survey	Highlights organizational AI readiness for analytics	Not directly linked to MIS maturity

Source : Author (2026)

Based on previous literature, EIS has been found to aid organizational surveillance, and maturity models stress continuous improvement of information systems. Data literacy refers to a critical human ability in understanding information, while AI readiness refers to technological and organizational readiness for new technology. However, few empirical works have considered these two dimensions together in developing a unified model of managerial information system maturity in higher education. This paper bridges the gap through developing an integrated model where Data Literacy and AI Readiness serve as predictors of MIS Maturity.

Conceptual model and hypothesis developing

The suggested theoretical model incorporates data literacy, AI readiness, and MIS maturity in relation to EIS implementation in higher education (Table 2).

Table 2. Construct and Measurement Structure of the Proposed Model

Higher-Order Construct	Lower-Order Dimensions	Number of Indicators
Data Literacy (DL)	Data Understanding; Data Analysis; Data Usage	9
AI Readiness (AIR)	Technology Infrastructure; Organizational Readiness; Human Resource Competence	9
MIS Maturity (MIS)	Data Integration; Information Quality; Analytics and Dashboard; Decision Support	12
Total	**10 lower-order dimensions**	**30**

Source : Author (2026)

Hence, the model is deliberately designed as a hierarchical component model and not a model with just three indicators or three first order constructs. The SmartPLS model supports three indicators for each lower-order construct.

Data Literacy and MIS Maturity

Data literate users are able to understand and utilize information provided by information systems much more efficiently. Data literacy gives an ability to interpret the information, make analysis and use the information for the right purposes. As far as EIS is concerned, the above-described qualities must assist in the efficient usage of integrated information, analytical dashboards and decision support. Within the framework of socio-technical approach, the maturity of the system depends to some extent on the user's ability to communicate with the technological system. Likewise, the DeLone and McLean model emphasizes the role of information quality and system usage in obtaining benefits from information systems (DeLone & McLean, 2003). Thus:

H1: Data literacy has a positive effect on MIS maturity in Executive Information System implementation.

AI Readiness and MIS Maturity

AI readiness is the level at which an organization is ready to adopt AI technologies. The technology infrastructure is the technical capacity that forms the basis of AI. Organizational readiness is what facilitates the adoption process, while human resource competence makes people use the emerging technologies. From the socio-technical view, technological capabilities need organizational and human capabilities to produce value for organizations. Thus, the more organizations are ready to embrace AI technologies, the more they have the capacity to develop analytical and decision support capabilities in their managerial information systems. As follows:

H2: AI readiness has a positive effect on MIS maturity in Executive Information System implementation.

Methodology

This paper uses the quantitative method through cross-sectional survey because it is consistent with the research objective: testing empirically hypothesized relationship(s) among latent constructs through statistical analysis. This research was carried out at a higher education institution in Indonesia which uses an Integrated Information System (SIE) for providing managerial and administrative information to its university management.

The respondents of this study were chosen through purposive sampling based on the criterion of having direct experience in using SIE for managerial and administrative tasks. In total, there were 53 valid responses for this analysis. Sample adequacy was taken into account in the context of hierarchical structure of the research model. This research model consists of three Higher Order Constructs (HOCs), ten Lower Order Constructs (LOCs) and thirty observed indicators (see Table 2). According to conventional "10-times" rule of thumb, the minimum requirement for the sample size is 40 (4 x 10); therefore, there are more than sufficient 53 valid responses in this study.

Measurement items were answered by participants through a structured questionnaire with five-point Likert Scale scoring format ranging from 1 (strongly disagree) to 5 (strongly agree). The development of the questionnaire was guided by the operational dimensions of Data Literacy, AI Readiness, and MIS Maturity. Data Literacy is an operational dimension that consists of Data Understanding, Data Analysis, and Data Usage. Similarly, AI Readiness includes the operational dimensions of Technology Infrastructure, Organizational Readiness, and Human Resource Competence. Finally, MIS Maturity has four dimensions: Data Integration, Information Quality, Analytics and Dashboards, and Decision-Making Support. Each lower-order dimension consists of three indicators; thus, there are a total of 30 indicators observed.

In the current research, the Hierarchical Component Model (HCM) is employed to model the multidimensional structure of these three constructs. Data Literacy, AI Readiness, and MIS Maturity are considered higher-order constructs that consist of lower-order dimensions. With the use of the HCM, the researcher can capture the multidimensional nature of the constructs without losing their dimensions. Higher-order constructs are estimated using a two-step approach where first, the lower-order constructs are estimated, followed by the estimation of the higher-order constructs with the use of their latent variable scores.

This was done in two steps, which are typical for determining and assessing higher order constructs in PLS-SEM (Sarstedt et al., 2019). The first step involved assessment of the measurement model in order to determine indicator reliability, internal consistency reliability, convergent validity and discriminant validity. Indicator reliability was determined using outer loadings, whereas internal consistency reliability was analyzed through Cronbach's alpha, rho_A and composite reliability. Convergent validity was measured using Average Variance Extracted (AVE) criterion, whereas discriminant validity was determined using Heterotrait-Monotrait (HTMT)

ratio criterion. This method corresponds to recommendations concerning PLS-SEM measurement model evaluation (Hair et al., 2019; Sarstedt et al., 2019).

The second step involved assessment of the structural model, including assessment of the hypothesized relationships between Data Literacy, AI Readiness and MIS Maturity. This assessment included path coefficients (β), coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2) and standardized root mean square residual (SRMR). Statistically significant results were obtained through bootstrapping using 5,000 replications. Bootstrapping creates empirical sampling distribution to determine statistical significance of PLS-SEM path coefficients and is recommended in PLS-SEM analysis (Hair et al., 2019).

Data analysis was done through the use of Partial Least Square Structural Equation Modelling (PLS-SEM). PLS-SEM was chosen as an appropriate data analysis technique because the research model proposed by this paper has many latent variables with hierarchical measurement structures and is geared towards the analysis of predictive relationships among Data Literacy, AI Readiness, and MIS Maturity. PLS-SEM is ideal for models with complex relationships among latent variables and has procedures for assessing both the measurement and structural models (Hair et al., 2019).

The current study proposes two hypotheses. The first hypothesis, H1, states that Data Literacy positively influences MIS Maturity, while the second hypothesis, H2, argues that AI Readiness positively affects MIS Maturity. The criteria for acceptance of the hypotheses include agreement of the estimated path coefficient with the hypothesized one.

Result and discussion

The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) for examining the measurement model, referred to as the outer model, as well as the structural model, referred to as the inner model. The findings are discussed in two phases.

Phase 1: Evaluating the Measurement Model

In evaluating the measurement model, the study established the indicator reliability, internal consistency reliability, as well as convergent validity, which were used as the basis for evaluating the measurement model. As seen in Figure 1, thefindings indicate that all the constructs are above the minimum required level, with all the indicator loadings above 0.70, indicating that the indicators are measuring the constructs correctly.

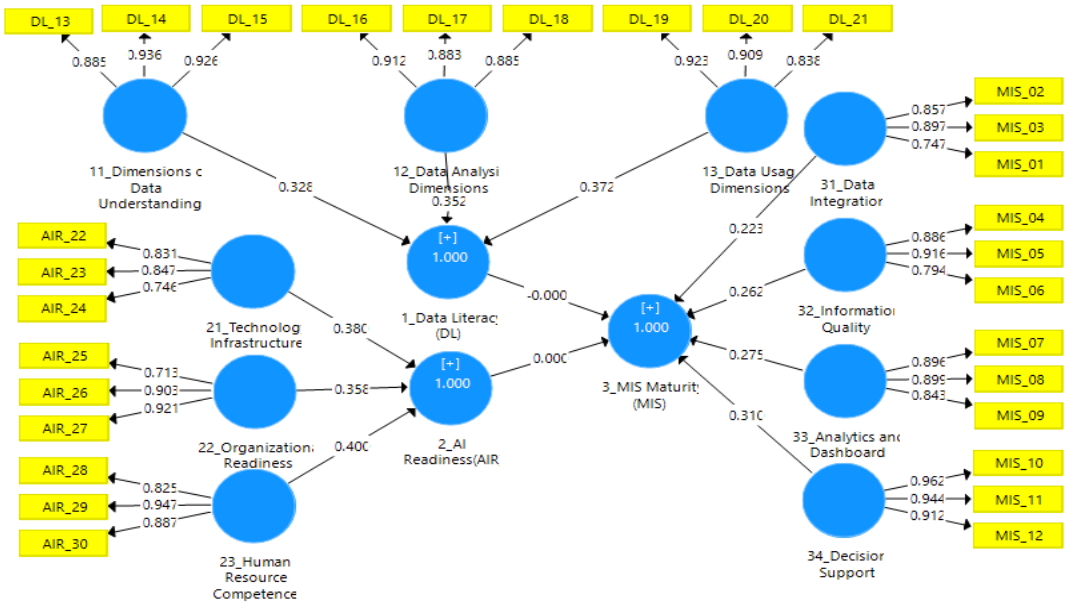

Figure 1. Outer Loading
Source: Output SmartPLS

In addition, the Composite Reliability as well as Cronbach's Alpha for all the constructs are above 0.70, indicating strong internal consistency reliability, while the Average Variance Extracted for all the constructs is above 0.50, indicating convergent validity. The evaluation of the measuring model is presented in Table 3.

Table 3. Construct Reliability and Convergent Validity

Constructs or Items	Cronbach's Alpha	rho_A	CR	AVE
31_Data Integration	0,785	0,819	0,874	0,699
32_Information Quality	0,833	0,843	0,901	0,752
33_Analytics and Dashboard	0,853	0,855	0,911	0,774
34_Decision Support	0,934	0,934	0,958	0,883
11_Dimensions of Data Understanding	0,904	0,908	0,940	0,839
12_Data Analysis Dimensions	0,873	0,874	0,922	0,798
13_Data Usage Dimensions	0,869	0,870	0,920	0,793
21_Technology Infrastructure	0,738	0,755	0,850	0,655
22_Organizational Readiness	0,803	0,823	0,886	0,724
23_Human Resource Competence	0,866	0,886	0,918	0,789

Source: Author's work, 2025.

This shows that the measurement model is valid and reliable, which is essential for further assessment of the structural model.

Table 4. Discriminant Validity (Fornell-Larcker Criterion)

	11_Data Understanding	12_Data Analysis	13_Data Usage	1_ (DL)	21_Technology Infrastructure	22_Organizational Readiness	23_Human Rsour Competence	2_AI Readiness (AIR)	31_Data Integration	32_Information Quality	33_Analytics and Dashboard	34_Decision Support	3_MIS Maturity
11_ Data Understanding	0,916												
12_Data Analysis	0,901	0,893											
13_Data Usage	0,776	0,894	0,891										
1_Data Literacy (DL)	0,933	0,979	0,940	0,856									
21_Technology Infrastructure	0,538	0,566	0,604	0,599	0,809								
22_Organizational Readiness	0,400	0,410	0,499	0,459	0,617	0,851							
23_Human Resource Competence	0,631	0,657	0,592	0,655	0,657	0,694	0,888						
2_AI Readiness(AIR)	0,602	0,627	0,648	0,657	0,864	0,871	0,899	0,745					
31_Data Integration	0,460	0,535	0,614	0,569	0,538	0,315	0,371	0,473	0,836				
32_Information Quality	0,442	0,623	0,726	0,635	0,773	0,551	0,605	0,736	0,759	0,867			
33_Analytics and Dashboard	0,550	0,655	0,764	0,696	0,692	0,473	0,493	0,636	0,803	0,883	0,880		
34_Decision Support	0,486	0,623	0,808	0,680	0,662	0,447	0,491	0,612	0,740	0,876	0,901	0,940	
3_MIS Maturity (MIS)	0,520	0,655	0,786	0,694	0,717	0,482	0,528	0,662	0,871	0,944	0,963	0,951	0,824

Source: Author's work, 2025.

Phase 2: Assessment of Structural Models

Having established that the measurement model is valid, we then proceeded to assess the structural model, whose purpose is to test the formulated hypotheses.

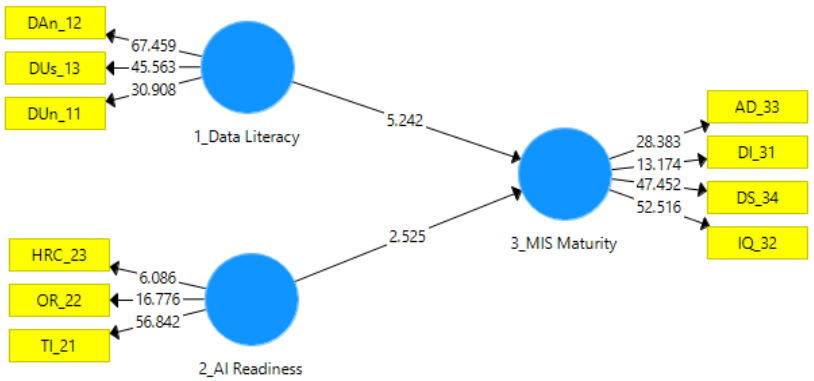

Figure 2: Model Laten Variabel.
Source: Output SmartPLS

The structural model was evaluated by means of partial least squares structural equation modeling (PLS-SEM), where bootstrapping procedures with 5,000 subsamples were used. The model was tested by checking path coefficient significance, the explanatory power of the model, and predictive relevance of constructs.

Results show that both exogenous variables have a positive and statistically significant effect on MIS Maturity. First, it was found that Data Literacy significantly affects MIS Maturity positively and that its path coefficient (β) is equal to 0.591, with a significance level below 0.001. Next, AI Readiness positively influences MIS Maturity too; its path coefficient (β) equals 0.271 and p-value is 0.0058.

Both hypotheses are proved true based on statistical results obtained; accordingly, it may be claimed that increasing data literacy and organizations' readiness to implement artificial intelligence technologies helps achieve higher maturity of management information systems, particularly when used for executive information system implementation.

Data Literacy appears to play a more significant role in affecting MIS Maturity than AI Readiness according to empirical findings. It can be assumed that effective interpretation and processing of data is an important factor when assessing higher maturity levels of management information systems.

For higher education institutions, especially in the application of executive information systems, data literacy helps in transforming raw data into useful information. This observation is in line with past literature, where it is noted that an organization’s capability to make decisions based on data plays a key role in improving performance and system maturity (Gupta & George, 2016; Hasan & Akter, 2022).

In contrast, AI Readiness, even though quite essential, has a lower impact than Data Literacy. This means that despite the importance of readiness of an organization towards technology, infrastructure, and artificial intelligence, these aspects alone cannot guarantee greater maturity in the use of the system. In short, it means that technologies like AI may not be able to deliver maximum utility without data literacy.

The results of this study offer a better insight into the factors influencing MIS maturity through its human capability and technological readiness interaction. Despite the fact that previous research was concentrated mainly on technological readiness and quality of systems in terms of their role in information system success, it was discovered that data literacy is a more fundamental concept in determining system maturity, specifically for EIS used in higher education institutions.

The substantial effect of data literacy indicates that MIS maturity does not depend only on the quality of the system, but also on its users' capacity to interpret, analyze and apply data for making decisions. Thus, this result supports the claims made by Akter et al. (2020), who pointed out the significance of analytical skills; however, data literacy should be considered a critical factor influencing MIS maturity and not organizational performance directly. The complexity of data analysis is especially important in a university environment, where many dimensions should be considered during decision-making processes.

Additionally, this study provides further support for the idea that digital transformation is inherently socio-technical in nature. The less prominent role played by AI readiness, although still influential, suggests that having the technical capabilities alone does not contribute to increasing MIS maturity. Even though AI readiness is associated with an organization's ability in terms of technology infrastructure, management, and people, the effect of such capabilities is conditional on how well the users interact with the data. It corresponds to the viewpoint that high-level technologies like artificial intelligence enable rather than drive the creation of value, unless complemented with sufficient human competencies.

Another major implication of the present research is the reconceptualization of information systems maturity. Maturity models traditionally focus on various stages of technological advancement, process standardization, and systems integration. On the other hand, the results indicate that it would be beneficial to expand the concept of maturity and incorporate cognitive and behavioral aspects into it, especially data literacy. The new approach can significantly contribute to the existing discussion on information systems maturity.

Moreover, the findings offer empirical evidence for the Information Systems Success Model developed by DeLone & McLean (2003). In particular, the findings reinforce the idea that the involvement of user characteristics plays an important role in the effectiveness of the system. Yet, the current research extends the original framework by introducing Data Literacy and AI Readiness as antecedents of MIS maturity.

In the case of Universitas Komputer Indonesia, it may be suggested that any attempts to improve the existing Executive Information System must take into account that mere system upgrades are unlikely to yield sustainable outcomes. On the contrary, greater focus should be paid to developing users' skills in processing data and using AI tools.

Conclusion

The current research intends to analyze the effects of Data Literacy and AI Readiness on MIS Maturity in the context of Executive Information System (EIS) deployment in higher education institutions. It was found that both factors positively influence MIS maturity; however, Data Literacy proves to be the leading variable among them.

It can be assumed that the level of maturity of management information systems depends primarily on the competence of its users in terms of their knowledge and skills related to processing and analyzing information. Although the level of AI Readiness also affects the maturity of the systems, the contribution of this component is limited to being a supportive one and helping in achieving better results from data usage.

Theoretical contributions are made to existing literature on the topic since the proposed framework of MIS maturity integrates the roles of technological and human variables. From a practical point of view, the outcomes can help higher education organizations improve their information systems' maturity by increasing their level of AI readiness and enhancing the data literacy of their members. For future research, the recommendation is to improve the model through inclusion of more variables such as organizational culture, support from leaders, data governance, and to test the model among several organizations.

References

Alyoussef, I. Y. (2023). Acceptance of e-learning in higher education: The role of task-technology fit with the information systems success model. *Heliyon*, *9*(3). https://doi.org/https://doi.org/10.1016/j.heliyon.2023.e13751

Bristol-Alagbariya, B., Ayanponle, O. L., & Ogedengbe, D. E. (2022). Developing and implementing advanced performance management systems for enhanced organizational productivity. *World Journal of Advanced Science and Technology*, *2*(1), 39–46. https://doi.org/https://doi.org/10.53346/wjast.2022.2.1.0037

Carvalho, J. V., Rocha, Á., van de Wetering, R., & Abreu, A. (2019). A Maturity model for hospital information systems. *Journal of Business Research*, *94*, 388–399.

Croucher, G., & Woelert, P. (2022). Administrative transformation and managerial growth: A longitudinal analysis of changes in the non-academic workforce at Australian universities. *Higher Education*, *84*(1), 159–175. https://doi.org/https://doi.org/10.1007/s10734-021-00759-8

Davenport, T. H., & Bean, R. (2018). Big companies are embracing analytics, but most still don't have a data-driven culture. *Harvard Business Review*, *6*, 1–4.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

Gebre, E. (2022). Conceptions and perspectives of data literacy in secondary education. *British Journal of Educational Technology*, *53*(5), 1080–1095. https://doi.org/https://doi.org/10.1111/bjet.13246

Gonugunta, K. C., & Leo, K. (2024). Role of data-driven decision making in enhancing higher education performance: A comprehensive analysis of analytics in institutional management. *International Journal of Acta Informatica*, *3*(1), 149–159.

Gupta, M., & George, J. F. (2016). Toward the development of a big data analytics capability. *Information & Management*, *53*(8), 1049–1064.

Hansen, H. F., Lillesund, E., Mikalef, P., & Altwaijry, N. (2024). Understanding artificial intelligence diffusion through an AI capability maturity model. *Information Systems Frontiers*, *26*(6), 2147–2163. https://doi.org/https://doi.org/10.1007/s10796-024-10528-4

Hasan, R., & Akter, S. (2022). Information System-Based Decision Support Tools: A Systematic Review Of Strategic Applications In Service-Oriented Enterprises. *Review of Applied Science and Technology*, *1*(04), 26–65. https://doi.org/https://doi.org/10.63125/w3cevz78

McLeod, L., & Doolin, B. (2012). Information systems development as situated socio-technical change: a

process approach. *European Journal of Information Systems*, *21*(2), 176–191.
Nurrahmawati, Y. (2026). Tren Penelitian Literasi Data Dalam Pendidikan Matematika: Sebuah Kajian Literatur. *Jurnal Pendidikan Matematika*, *1*(1), 40–50.
Saremi, S. (2025). The Strategic Role of Information Systems in Modern Business: Empowering Decision-Making and Sustaining Competitive Advantage. *International Conference on Science, Engineering Management and Information Technology*, 82–93. https://link.springer.com/chapter/10.1007/978-3-032-04228-6_6
Soegoto, H. S. (2019). The Application of Integrated Executive Information System. *IOP Conference Series: Materials Science and Engineering*, *662*(2), 22007. https://doi.org/doi:10.1088/1757-899X/662/2/022007
Suryana, T. (2017). Rancang Bangun Sistem Informasi Eksekutif Perguruan Tinggi. *Majalah Ilmiah UNIKOM*, *15*(2).
Varajão, J., Marques, R. P., & Trigo, A. (2022). Project management processes–impact on the success of information systems projects. *Informatica*, *33*(2), 421–436. https://doi.org/https://doi.org/10.15388/22-INFOR488
Wasesa, I. R. H., Permatasari, D., Angkat, F. A., & Al-Khowarizmi, A.-K. (2025). Integration of artificial intelligence in management information systems to improve the effectiveness of strategic decision-making in the digital era. *Journal of Computer Science, Information Technology and Telecommunication Engineering*, *6*(2), 923–929. https://doi.org/DOI: 10.30596/jcositte.v6i2.26051
Wolff, A., Gooch, D., Montaner, J. J. C., Rashid, U., & Kortuem, G. (2016). Creating an understanding of data literacy for a data-driven society. *The Journal of Community Informatics*, *12*(3).
Zong, Z., & Guan, Y. (2025). AI-driven intelligent data analytics and predictive analysis in Industry 4.0: Transforming knowledge, innovation, and efficiency. *Journal of the Knowledge Economy*, *16*(1), 864–903. https://link.springer.com/article/10.1007/s13132-024-02001-z