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A Conceptual Model For The Interplay Among Digital Transformation, Information System Quality, The Use Of *E-Kinerja* Application, And State Civil Apparatus Work Productivity

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Abstract: *This research aimed to develop a conceptual model examining the interplay among digital transformation, information system quality, the use of E-Kinerja application and State Civil Apparatus (SCA) work productivity. As the foregoing, this research deployed four variables which were drawn into a conceptual model by formulating six hypotheses. This research used the Partial Least Squares Structural Equation Modeling approach to frame the model and statistically testing it. 250 SCAs (both lecturers and staff at IAIN Curup) were involved as the respondents because they had adequate experiences regarding the use of E-Kinerja application. Data were collected using valid and reliable questionnaires. Using Smart PLS 4 program, the data were analyzed to evaluate the developed conceptual model. The analysis results demonstrated that digital transformation positively influenced SCA Work productivity (H1) with a path coefficient of 0.202 and T-statistics of 4.696. The impacts of digital transformation on the use of E-Kinerja application (H2) and on the quality of information systems (H3) were very strong, with path coefficients of 0.330 and 0.690 respectively, and very high T-statistics. The influence of information system quality on the use of E-Kinerja application (H4) was also significant with a coefficient of 0.637 and T-statistics of 18.300. Even though the direct influence of information system quality on SCA work productivity (H5) was more moderate, the significance value still showed that information system quality played a vital role in supporting efficient work productivity. Finally, a very prominent result was the influence of using the E-Kinerja application on SCA Work productivity (H6), with a coefficient of 0.589 and T-statistics of 6.572. The forgoing data demonstrated that the developed model was well-confirmed empirically. This research highlights that a well-designed application for work management, such as E-Kinerja, when supported by the implementation of digital transformation and information system quality, can enhance employees' work productivity. Future research is expected to examine moderating factors that can influence the effectiveness of digital transformation.*

Keywords: *Digital Transformation; Information System Quality; The Use Of E-Kinerja Application, And Work Productivity*

INTRODUCTION

The work productivity of State Civil Aparatuses (SCAs), especially lecturers and staff in universities, is very important to improve the quality of education, operational efficiency and institutional reputation. High productivity

can contribute to improving the accreditation of study programs and institutions, as well as encouraging innovation and relevant research (Kaseger et al., 2021). However, various problems such as administrative burden, limited facilities, lack of motivation, and poor time management often hinder their productivity. To overcome this, digital transformation is needed to control the performance of lecturers and staff more effectively. Implementing an integrated information system can facilitate administrative and academic processes, as well as enable more accurate technology-based performance monitoring and evaluation. In this way, digital transformation can create a more efficient, productive, and adaptive work environment for SCA lecturers and staff.

In the current digital era, information technology transformation has become a driving force in increasing efficiency and effectiveness in various sectors, including higher education. The use of innovative technology not only speeds up administrative processes but also supports the achievement of broader educational goals through increasing access and quality of learning (Bond et al., 2020). Institut Agama Islam Negeri (IAIN) Curup, for example, has identified digital technology as an important tool to strengthen their internal management and operations. Given the complexity of the challenges faced by religious education institutions, effective implementation of digital transformation is crucial to support the continuity of quality education (Mukul & Büyüközkan, 2023). This transformation process not only aims to optimize existing processes but also to open up new opportunities in teaching and institutional management (Aliah & Warsah, 2021). Therefore, digital transformation at IAIN Curup is very urgent, especially in the context of increasing SCA work productivity.

IAIN Curup faces unique challenges in implementing information technology. Digital transformation initiatives at the institution include the digitization of data records, learning management systems, and personnel operations, all of which aim to achieve greater operational efficiency. However, challenges in implementing this are often related to the quality of existing information systems, which affects the overall effectiveness of technology initiatives (Warsah, 2021). Therefore, an in-depth evaluation of the impact of digital transformation on SCA work productivity in this institution needs to be carried out. The use of the E-Kinerja application (Eritrina et al., 2023), which has been introduced at IAIN Curup, is one solution to overcome this challenge. As observed, the e-Kinerja application is a web-based system used by the government to manage the performance of Civil Servants. This application allows employees to plan, implement, and assess their performance electronically, with the main goal of increasing efficiency and effectiveness in performance evaluation, attendance monitoring, and work performance

documentation. The main functions of this application include monitoring employee attendance, evaluating performance based on Employee Performance Targets, documenting work performance for reference for promotion or capacity development, as well as managing employee performance allowances and meals based on assessed performance. The e-Kinerja application was developed by the State Civil Service Agency and used by Civil Servants in various government agencies to increase transparency and efficiency in performance management.

Digital transformation, quality of information systems, and use of the E-Kinerja application are key variables that are expected to influence SCA work productivity at IAIN Curup. Digital transformation is not only expected to simplify procedures but also increase employee involvement and motivation through a more transparent and accountable system. Meanwhile, high quality information systems are expected to support data reliability and accessibility (Nuryanti et al., 2021). Accurate and easily accessible data is especially important in academic environments, where the speed and accuracy of information play a critical role in effective decision making (Yağcı, 2022). Therefore, the relationships among digital transformation, information system quality, and work productivity require detailed and comprehensive analysis to reveal the existing dynamics within the context of SCA productivity.

In the existing literature, previous research tends to limit its focus on the individual effects of digital transformation. For example, McCarthy et al. (2023) conducted research focusing on the effects of digital transformation in education, finding that this increases the efficiency and effectiveness of information management and educational services. Additionally, digital transformation enables rapid adaptation to change, as seen during the COVID-19 pandemic, and improves quality and inclusion in education through better access to technology and pedagogical innovation. Nurhas et al. (2022) explored the challenges of rapid digital transformation that have emerged during the COVID-19 pandemic in the context of higher education, using the Q method to understand the nine challenges faced and the four main patterns of transformation. The research results expand understanding of digital transformation in higher education, and present a framework to support technology choices and strategic interventions based on multiple levels of individual, group, and organizational behavior. Other studies have been done on the issue of information system quality. For examples, Logachev et al. (2021) conducted research on the improvement of management and quality control of educational programs through the development of efficient information systems. The research results include a model for identifying problems in the organization of educational quality control and an objective assessment system

that reduces subjective evaluation, allowing for quantitative evaluation and more efficient unification of quality monitoring procedures. Rahmania et al. (2020) conducted a study to examine the implementation of the Internal Quality Assurance System at SMP 21 Malang and the inhibiting factors in improving the quality of education. The research results show that the implementation of the Internal Quality Assurance System involving all school components from 2016 to 2019 has gone well and has been proven to improve the quality of graduates, marked by achieving 4th place in the Computer-Based National Examination in 2019.

Pursuant to the above reviews of literature, there is a significant gap in understanding how digital transformation and information system quality simultaneously influence the use of a technological application, such as E-Kinerja, and work productivity. In addition, there are no previous studies that have drawn a model for the E-Kinerja application as a crucial mediator. Although much of the literature has identified the aforesaid components separately, little or even no identical research has integrated them in a model.

To fill in the above gap, this research aims to develop a conceptual model for the interplay among digital transformation, information system quality, the use of e-kinerja application, and SCA work productivity at IAIN Curup. In the conceptual model of this research, the foregoing four variables are reorganized into a conceptual model by formulating six hypotheses (See the last part of literature section to go along with the formulation of the six hypotheses). The formulated hypotheses entail (H1) Digital transformation has a positive and significant effect on the productivity of SCA performance at IAIN Curup; (H2) Digital transformation has a positive and significant effect on the use of the E-Kinerja application at IAIN Curup; (H3) Digital transformation has a positive and significant effect on the quality of information systems at IAIN Curup; (H4) The quality of the information system has a positive and significant effect on the use of the E-Kinerja application at IAIN Curup; (H5) The quality of the information system has a positive and significant effect on the productivity of SCA performance at IAIN Curup; and (H6) The use of the E-Kinerja application has a positive and significant effect on the productivity of SCA performance at IAIN Curup.

It is hoped that the results of this research provide theories of how to implement the use of a new working management application, such as E-Kinerja in this context, by considering supports from ideal digital transformation and qualified information system. In the foregoing way, such a new working management application can pave the way for the enhancement of work productivity. It is also expected that this research practically provides

insight for stakeholders at IAIN Curup to improve information technology strategies and performance management.

Digital Transformation

Digital transformation in higher education is defined as the broad and strategic integration of digital technologies in all aspects of educational and administrative activities to change the way institutions operate and deliver value to students and staff (Bygstad et al., 2022). This concept includes the adoption of advanced digital tools, cloud applications and innovative data management systems. The benefits of this holistic approach include increased operational efficiency, improved teaching quality, and increased student engagement through more interactive and responsive learning methods (Marks & Al-Ali, 2022). In the context of higher education, digital transformation is not just about adopting new technologies, but also about reforming critical processes that support educational and research missions. Therefore, this transformation is often seen as the key to maintaining relevance and competitive advantage in a rapidly changing digital era (Elisvi et al., 2020). The success of digital transformation in higher education depends largely on an institution's ability to align technology with its educational strategy and the unique needs of its academic environment.

Reviewed from Abdulrahim and Mabrouk (2020) and Kaputa et al. (2022), digital transformation involves several important indicators. The first is adoption of new technology which refers to the use of the latest technology to increase efficiency and innovation. The second is IT infrastructure that ensures the availability and reliability of hardware and software that supports company operations. The third is training and development which is important to improve employee skills in operating new technology. The fourth is system integration that connects various applications and platforms to streamline workflow and communication. The fifth is data accessibility that enables employees to access relevant data quickly and easily, supporting better decision making. The sixth is technical support which provides aids and troubleshooting to ensure technology functions optimally.

Even though the potential benefits are large, the implementation of digital transformation in higher education is not free from challenges and obstacles. Key challenges include issues of data security and privacy, which are becoming increasingly critical as the amount of student data generated and stored digitally increases (Benavides et al., 2020). Resistance from teaching and administrative staff who are more comfortable with traditional methods is also a significant barrier, often slowing the adoption of new digital solutions (Akour & Alenezi, 2022). Additionally, gaps in the literature are often seen in the specific

context of the needs and challenges faced by SCA in higher education, where policy and process adaptation may require more detailed consideration of factors such as regulatory compliance and specific workflows.

Information System Quality

Information system quality in the higher education context can be articulated along several critical dimensions, including reliability, usability, relevance, and technical support (Logachev et al., 2021). Logachev et al. (2021) explained that the quality of an information system is determined by several indicators. First, system reliability ensures the system operates without interruption and with high consistency. Second, ease of use makes the system intuitive and easy for users to operate. Third, data security protects sensitive information from unauthorized access and cyber threats. Fourth, information relevance ensures that the data presented is appropriate and useful for user needs. Fifth, information availability ensures that information can be accessed whenever needed. Sixth, user support provides quick help and solutions to problems users encounter, ensuring a smooth and efficient experience.

The quality of information systems plays an important role in determining the efficiency and effectiveness of work processes in higher education, especially in administration and management (Warsah et al., 2020). A reliable and easy-to-use system allows staff to manage academic and administrative data more efficiently, reducing the time and effort required for routine tasks. High quality information ensures that decisions made by management are based on accurate and up-to-date data, reducing the risk of errors. Recent studies show that universities with high-quality information systems tend to have higher levels of user satisfaction, which contributes directly to improving organizational performance (Simonova et al., 2021). However, despite the clear importance of these systems, many institutions still struggle to integrate effective IT solutions that can address the full complexity of higher education operations.

Despite widespread recognition of the importance of quality information systems, many higher education institutions still face deficiencies in existing systems, which can seriously affect operations and user satisfaction. Issues such as systems that are unreliable, difficult to use, or do not provide relevant information can hinder productivity and increase frustration among staff and students (Masalimova et al., 2022). Additionally, existing studies are often inadequate in exploring how these shortcomings directly affect the performance and satisfaction of SCA in academic contexts. This gap in the literature suggests a need for further research that not only identifies and measures the direct

impact of information systems quality on SCA performance but also develops strategies to effectively address these gaps.

E-Kinerja Application

The E-Kinerja application is an information technology system designed to monitor, evaluate and improve staff performance in higher education. The main goal is to simplify the performance assessment process, ensuring that assessments are carried out consistently and transparently (Kamela et al., 2023). Reviewed from Kamela et al. (2023) and Wantania et al. (2021), the use of the E-Kinerja application can be measured through several indicators. First, usage frequency reflects how often the application is used by employees. Second, user satisfaction indicates the extent to which users are satisfied with the application. Third, feature understanding shows how well users understand and utilize existing features. Fourth, impact on performance measures the effect of applications on increasing productivity and work efficiency. Fifth, integration with daily activities assesses the extent to which this application is integrated into daily work routines. Sixth, impact on decision making assesses how this application helps in a better decision-making process.

The use of the E-Kinerja application has a substantial impact on increasing transparency and accountability in managing SCA performance in higher education. This system facilitates the collection of objective performance data, which plays a role in making the assessment process fairer and more measurable. This, in turn, increases SCA confidence in the integrity of the assessment process and can lead to increased overall productivity (Yanuarita & Susanto, 2023). However, adoption and acceptance of the E-Kinerja application by SCAs can be influenced by various factors, including internal policies, availability of training, and perceived benefits of the application. Studies show that higher acceptance occurs in environments where management actively supports the use of technology and provides sufficient resources for training. Therefore, an effective implementation strategy must consider aspects such as user involvement, effective communication, and technical support (Wantania et al., 2021).

SCA Work Productivity

The work productivity of SCA in higher education is often measured through their ability to efficiently manage and complete tasks that support the educational and administrative goals of the institution (Kaseger et al., 2021). This productivity is not only related to the quantity of output, but also the quality and impact of the work done.

Reviewed from Murphy (2016) and Murphy and Johnson (2016), there are five important indicators of work productivity in the context of workers. The first is work efficiency which is improved through workers' confidence in their abilities, which helps in skill development and more effective task management, as well as managing creativity and efficient production processes. The second is output quality that is improved through increasing workers' skills and abilities in completing tasks, and by coordinating various creative and technical elements. The third is target achievement which is achieved by setting and achieving effective goals and ensuring projects are completed on time and within budget. The fouth is independence in work that is demonstrated by workers who are confident and able to work independently and take initiative in their role, especially in managing various aspects of production. The fifth is initiative and innovation that are driven by the high self-confidence of workers who tend to be more innovative and proactive in taking initiatives for personal and team development and overcoming production challenges with creative new ideas.

SCA productivity in higher education is influenced by various factors including technology, individual motivation, and the work environment. The use of technology, such as the E-Kinerja application, has been shown to have a significant impact on productivity by simplifying administration, improving communication, and providing a platform for more effective performance management (Kamela et al., 2023). Individual motivation also plays a critical role, where SCA who feel valued and involved tend to have higher productivity (Mulyani, 2020). A supportive work environment, including adequate facilities, flexible work policies, and a positive organizational culture, are also important factors that contribute to SCA productivity levels. The correlation between technology and productivity is particularly interesting, as technology adoption is often associated with increased efficiency but can also bring adaptation challenges that may affect short-term productivity (Marks & Al-Ali, 2022). Further research is needed to explore this balance and optimize the use of technology in supporting SCAs.

Interactions among Digital Transformation, Information System Quality, Use of the E-Kinerja Application, and SCA Work Productivity in Higher Education

Digital transformation at IAIN Curup is estimated to have a significant influence on SCA work productivity, by modernizing existing infrastructure and work methods. By utilizing advanced digital technology, this transformation allows SCA to access information quickly and accurately, as well as automate tasks that previously took time and energy, freeing them to focus on more strategic tasks. The integration of digital learning management systems and

efficient internal communication platforms is a concrete example of how digital transformation can support work productivity (Marks & Al-Ali, 2022). Additionally, digitization of administrative processes speeds up workflow and reduces errors, resulting in increased output and quality of work. As a result, SCA can achieve institutional goals more effectively.

Digital transformation at IAIN Curup also greatly influences the adoption and effectiveness of using the E-Kinerja application. The implementation of this new technology enables broader data integration and deeper performance analysis, both of which are key to the effective use of E-Kinerja application. With better digital infrastructure, this application can be operated more smoothly, offering more user-friendly interfaces and more responsive features, which in turn increases the likelihood of their adoption by SCAs (Niswaty et al., 2023). Digital transformation provides the necessary bandwidth and computing capabilities to handle large volumes of data, which is critical for optimal performance of E-Kinerja application. Therefore, developments in digital transformation at IAIN Curup are expected to directly support wider and more effective use of the E-Kinerja application.

In the context of digital transformation at IAIN Curup, improving the quality of information systems is very important. Because digital transformation includes improvements to technology infrastructure, such as more advanced servers and more stable connectivity, it directly increases the reliability and efficiency of information systems. This transformation also introduces new standards in data security and system integration, reducing the risk of information leakage and misuse. Furthermore, the presence of better analytical tools as part of improved information systems enables more precise and data-driven decision making, improving the quality of decision making across institutions (Kaputa et al., 2022). Therefore, digital transformation efforts at IAIN Curup are expected to positively influence the quality of information systems.

The high quality of the information system at IAIN Curup plays an important role in supporting the implementation and effectiveness of the E-Kinerja application. A reliable and informative system makes it easy to integrate the E-Kinerja application into SCAs' daily workflow, allowing them to access and utilize the application's features more efficiently. A quality information system can provide the necessary technical support and ensure the availability of data required by the E-Kinerja application for optimal operation (Logachev et al., 2021). Furthermore, with effective information system, input and output data from the E-Kinerja application can be processed quickly and accurately, increasing the application's utility in performance management. Therefore,

improving the quality of information systems is expected to have a direct positive impact on the use of the E-Kinerja application at IAIN Curup.

The quality of the information system at IAIN Curup directly influences SCA productivity by providing the tools they need to work efficiently and effectively. A quality system provides timely and accurate information, reducing the time needed to search for data and reducing the possibility of operational errors. This facility allows SCAs to allocate more time to other important tasks, increasing the output and quality of their work. Good information systems also support better collaboration and communication among staff, important factors in increasing cohesion and synergy in the workplace (Logachev et al., 2021). Therefore, the quality of the improved information system at IAIN Curup is estimated to significantly increase SCA work productivity.

The use of the E-Kinerja application at IAIN Curup is estimated to have a significant positive effect on SCA productivity. This application enables more effective performance monitoring, providing SCA and management with regular and objective feedback on performance. This not only helps in fair assessment but also motivates SCAs to improve their performance. The E-Kinerja application also facilitates better career planning and professional development by identifying training needs and possible career paths. Additionally, by automating some administrative functions, this application reduces manual workload (Wantania et al., 2021), allowing SCAs to spend more time on core tasks that add value to the institution. Therefore, the use of the E-Kinerja application is expected to contribute positively to increasing SCA work productivity at IAIN Curup.

The interactions among digital transformation, information system quality, the use of E-Kinerja application, and SCA work productivity above helps researchers to formulate the following hypothesis:

(H1) Digital transformation has a positive and significant effect on the productivity of SCA performance at IAIN Curup

(H2) Digital transformation has a positive and significant effect on the use of the E-Kinerja application at IAIN Curup

(H3) Digital transformation has a positive and significant effect on the quality of information systems at IAIN Curup

(H4) The quality of the information system has a positive and significant effect on the use of the E-Kinerja application at IAIN Curup

(H5) The quality of the information system has a positive and significant effect on the productivity of SCA performance at IAIN Curup

(H6) The use of the E-Kinerja application has a positive and significant effect on the productivity of SCA performance at IAIN Curup

RESEARCH METHOD

Research design

This research adopted a quantitative approach using a survey to collect the data needed to develop a conceptual model representing the interplay among digital transformation, information system quality, the use of the E-Kinerja application, and SCA work productivity at IAIN Curup. The quantitative data in this research were categorized as ordinal data. Ordinal data showed the order or ranking between data values. In developing the research model, the researchers integrated theory and previous research as a conceptual basis for forming our analytical framework. The research was designed to not only identify causal relationships but also to measure the intensity and significance of these influences using structural equation modeling. This model allowed the researchers to simultaneously evaluate relationships among variables through the Partial Least Squares Structural Equation Modeling (Hair Jr et al., 2020), which were well suited for exploratory and complex models like the one being investigated in this research. PLS-SEM was chosen because of its ability to handle models with many variables and uncertain relationships, as well as its ability to overcome the problem of small samples and non-normal data distribution. Thus, this research aimed to provide valid and reliable insight into the dynamics between technology and productivity in higher education institutions. The hypothesis model tested in this research is presented in Figure 1.

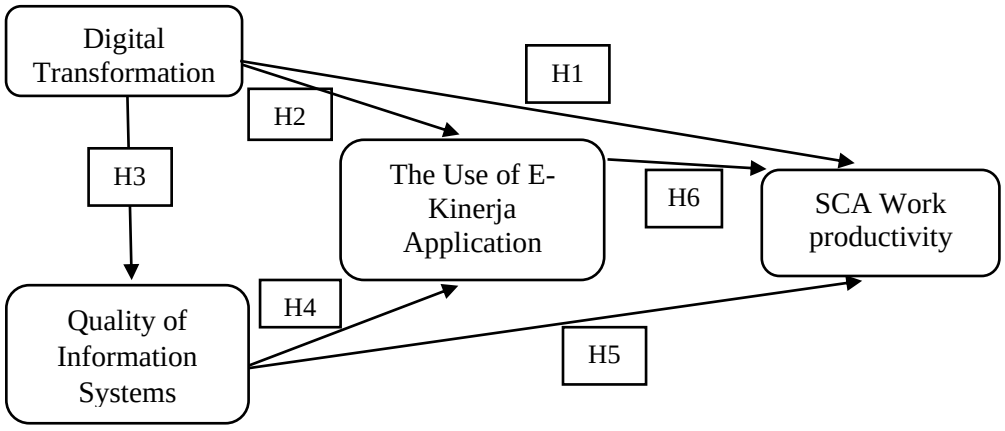

Figure 1. Hypothesized Model

Population and Sample

The population in this study consisted of all SCA who worked at IAIN Curup. To obtain a representative sample of the population, the researchers set a target sample of 250 respondents, which was considered sufficient for complex statistical analyses such as PLS-SEM. The sampling method used was stratified random sampling, where SCA were divided into strata based on faculty or department to ensure that each part of the organization was represented proportionally. This careful sampling process aimed to reduce sampling bias and increase the generalizability of the findings. Detailed information on the demographic and professional characteristics of the sample was collected to enable further segmentation analysis and to control for background variables in the analysis model. This accurate and representative sample was crucial for the external validity of research results.

Data collection technique

Data of this research were collected through a questionnaire specifically designed to measure research variables such as digital transformation, information system quality, use of the E-Kinerja application, and work productivity. This questionnaire adopted a Likert scale format which consisted 23 statements or items. The content of questionnaire was constructed based on the variabels of digital transformation, information system quality, use of the E-Kinerja application, and work productivity. The variable of digital transformation had 6 indicators which were articulated into 6 items. The indicators were absorbed from the works of Abdulrahim and Mabrouk (2020) and Kaputa et al. (2022). The variable of information system quality had 6 indicators which were articulated into 6 items. The indicators were absorbed from the work of Logachev et al. (2021). The variable of the use of E-Kinerja application had 6 indicators which were articulated into 6 items. The indicators were observed from the works of Kamela et al. (2023) and Wantania et al. (2021). The variable of SCA work productivity was constructed from the works of Murphy (2016) and Murphy and Johnson (2016). This variable had 5 indicators which were articulated into 5 items. The details of indicators and items of the questionnaire can be seen in Table 1 presenting the blueprint or lattice of the questionnaire. The questionnaire used 5 scales from strongly disagree to strongly agree.

Tabel 1. Variables, Indicators, dan Items of the Questioner

Variables	Indicators	Items
Digital Transformation	Adoption of New Technology	I often use new technology introduced at IAIN Curup.
	IT Infrastructure	The IT infrastructure at IAIN Curup

		is adequate to support my work activities.
	Training and development	I received adequate training to use new technology at IAIN Curup.
	System Integration	The information technology system at IAIN Curup is well integrated between departments.
	Data Accessibility	I can easily access the information I need for my work through the IAIN Curup digital system.
	Technical Support	Technical support was available quickly when I experienced technology problems at IAIN Curup.
Quality of Information Systems	System Reliability	The information system that I use rarely experiences problems.
	Ease of Use	I find it easy to use the information system available at IAIN Curup.
	Data Security	I am confident that my personal and professional data is safe in the IAIN Curup information system.
	Information Relevance	The information provided by the information system is very relevant to my tasks.
	Availability of Information	The information I need is always available at any time through the information system.
	User Support	I get the necessary help from the IT team when using the information system.
Use of the E-Kinerja Application	Frequency of Use	I use the E-Kinerja application every day to monitor my performance.
	User Satisfaction	I am satisfied with the functionality offered by the E-Kinerja application.
	Feature Understanding	I understand all the features available in the E-Kinerja application.
	Impact on Performance	Using the E-Kinerja application has improved my work performance.
	Integration with Daily Activities	The E-Kinerja application is well integrated into my daily work routine.
	Impact on Decision Making	The E-Kinerja application helps me make better decisions at work.

SCA Work Productivity	Work Efficiency	I can complete my work faster than before.
	Output Quality	The quality of my work has improved since using existing IT systems.
	Target Achievement	I consistently achieve set performance targets.
	Independence in Work	I can work more independently without needing too much help from other people.
	Initiative and Innovation	I feel more motivated to take initiative and propose innovative ideas at work.

To ensure the accuracy and relevance of the questionnaire that had been developed, the validation process was carried out with the help of an expert panel consisting of academics and practitioners in the fields of human resource management, information technology, and higher education administration. These experts provided critical input that helped refine both the content and structure of the questionnaire, ensuring that each item effectively measured the intended concept.

Furthermore, this validated questionnaire was tested through a pilot study involving 100 IAIN Curup employees who were not included in the main research sample. The aim of this pilot test was to assess the feasibility and understandability of the questionnaire, as well as to conduct initial statistical analysis of the data collected. The results of the pilot study showed that the questionnaire could be understood and completed easily by respondents, and the feedback received was used to make final adjustments to the questionnaire before its use in the larger study.

In terms of the validity of the questionnaire items, all items showed high factor loading values on the corresponding constructs, with validation figures ranging from 0.6 to 0.9, exceeding the minimum threshold of 0.5 recommended by Hair et al. (2019) for exploratory research. This showed that each questionnaire item was valid and able to measure specific aspects of the construct under study accurately.

Regarding the reliability of the questionnaire, testing using Cronbach's Alpha produced consistent values above 0.7 for each scale, indicating that the questionnaire had high reliability. This value exceeded the generally accepted threshold for internal reliability, namely 0.7, in accordance with the explanation of Hair et al. (2019). This indicated that the questionnaire could not only produce consistent data but also be stable in measuring the variables studied in different contexts. Thus, the questionnaire that had been developed and

validated was ready to be used to collect data in the main research, with the hope that further analysis would produce valuable insights regarding the dynamics between digital transformation, information system quality, use of the E-Kinerja application, and SCA work productivity at IAIN Curup.

Data analysis technique

Data analysis was carried out using PLS-SEM software to test the conceptual model and research hypotheses. The first stage in PLS-SEM was the evaluation of the measurement model, where the reliability and validity of the constructs being measured were analyzed using Cronbach's alpha, Composite Reliability, and Average Variance Extracted (AVE). This step was important to ensure that the measurement instrument was able to accurately and consistently measure the variables in question. After the validity of the measurement model was confirmed, the structural model was analyzed to assess the relationship between the independent and dependent variables. Bootstrapping techniques were used to test the significance of paths and direct and indirect effects in the model. The results of this analysis provided empirical evidence regarding the extent to which digital transformation, information system quality, and the use of the E-Kinerja application influenced SCA productivity at IAIN Curup, helping to identify intervention areas to improve operational effectiveness and job satisfaction.

RESULTS AND DISCUSSION

In this research, the conceptual model analysis using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach included evaluation of measurement models and structural models (Hair et al., 2019). The measurement model, or measurement model, was the part of the model that connected latent constructs with the indicators being measured. The purpose of measurement model analysis was to ensure that the indicators accurately and reliably reflected the latent construct. This analysis included computing loading factors to measure the strength of each indicator related to its latent construct, Cronbach's Alpha to measure internal reliability, composite reliability for internal consistency, convergent validity to ensure indicators of one construct were highly correlated, and discriminant validity to ensure that the constructs were truly different from each other. Structural models, or structural models, described the relationships between latent constructs. The purpose of structural model analysis was to test hypotheses and determine the strength of the relationship between constructs. This analysis included computing multicollinearity to ensure there was no high correlation between predictors, hypothesis testing to determine whether the relationship between constructs was significant or not, measuring R square (R^2) to measure how much variance in

the endogenous construct was explained by the exogenous construct, measuring F square (F^2) to measure the effect size of each predictor, and Q square (Q^2) measurement to measure the predictive relevance of the model. This analysis helped ensure the validity and reliability of the model and verified the hypotheses proposed in the research.

Measurement Model

Measurement model analysis was carried out by computing the outer loading value for each item, the reliability value seen from the results of the Cronbach's alpha (CA) and Composite Reliability (CR) analysis, the convergent validity value (AVE), and the discriminant validity value (Heterotrait-monotrait ratio (HTMT).)). The computational results of the elements mentioned can be seen in Figure 2 and Tables 2 and 3.

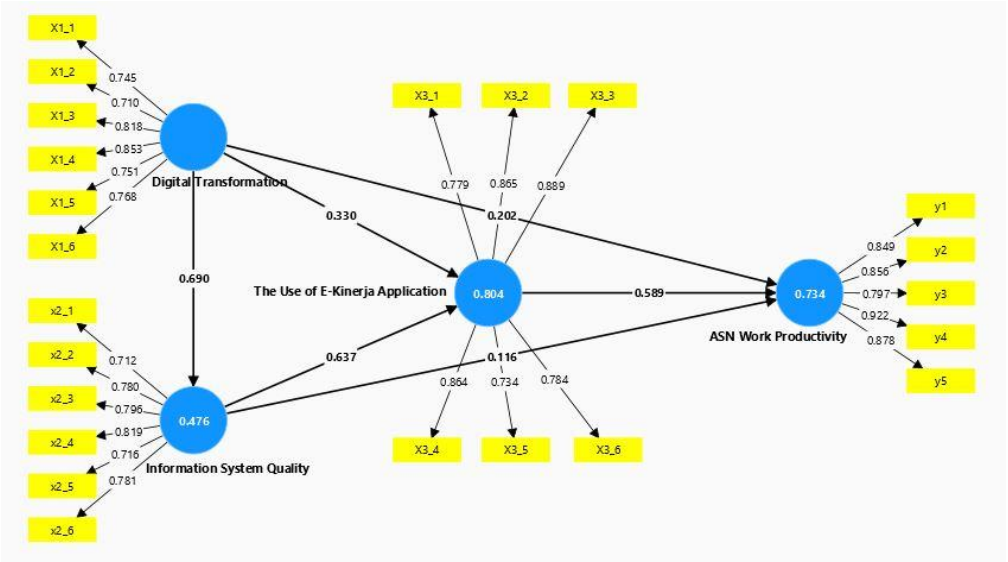

Figure 2. Outer Loading Values of Items in Each Variable

Table 2. Outer Loadings, Reliability (CA and CR), and Convergent Validity (AVE)

Variables	Items	Outer Loadings	CA	CR	AVE
Digital Transformation	I often use new technology introduced at IAIN Curup.	0.745	0.867	0.900	0.602
	The IT infrastructure at	0.710			

	IAIN Curup is adequate to support my work activities.				
	I received adequate training to use new technology at IAIN Curup.	0.818			
	The information technology system at IAIN Curup is well integrated between departments.	0.853			
	I can easily access the information I need for my work through the IAIN Curup digital system.	0.751			
	Technical support was available quickly when I experienced technology problems at IAIN Curup.	0.768			
System Information Quality	The information system that I use rarely experiences problems.	0.712	0.861	0.896	0.590
	I find it easy to use the information system available at IAIN Curup.	0.780			
	I am confident that my personal and professional data is safe in the IAIN Curup information system.	0.796			
	The information provided by the information system is very relevant to my tasks.	0.819			
	The information I need is always available at any time through the information system.	0.716			
	I get the necessary help from the IT team when using the information system.	0.781			
The Use of E-Kinerja Application	I use the E-Kinerja application every day to monitor my performance.	0.779	0.902	0.925	0.674

	I am satisfied with the functionality offered by the E-Kinerja application.	0.865			
	I understand all the features available in the E-Kinerja application.	0.889			
	Using the E-Kinerja application has improved my work performance.	0.864			
	The E-Kinerja application is well integrated into my daily work routine.	0.734			
	The E-Kinerja application helps me make better decisions at work.	0.784			
SCA Work Productivity	I can complete my work faster than before.	0.849	0.912	0.935	0.742
	The quality of my work has improved since using existing IT systems.	0.856			
	I consistently achieve set performance targets.	0.797			
	I can work more independently without needing too much help from other people.	0.922			
	I feel more motivated to take initiative and propose innovative ideas at work.	0.878			

Figure 2 and Table 2 show that each variable was tested against four key aspects: Outer Loading, Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE). Outer Loadings for all items, which ranged from 0.710 to 0.922, showed strong and significant relationships with their latent variables. According to Hair et al. (2019), an outer loading value exceeding 0.7 is considered adequate to maintain items in the construct, ensuring that each item is effective in measuring the intended concept. For reliability, the Cronbach's Alpha value of each variable showed a high level of internal consistency, with the lowest value being 0.861 and the highest being 0.912. In accordance with the standards described by Hair et al. (2019), alpha values above 0.7 are considered adequate, indicating that the items consistently

reflect the construct they measure. Furthermore, the Composite Reliability of all variables was also very satisfactory, with the lowest value of 0.896 and the highest value of 0.935, exceeding the recommended minimum limit of 0.7, confirming the high reliability of this measure.

In terms of convergent validity, the AVE for each variable also exceeded the minimum threshold of 0.5, with the lowest value being 0.590 and the highest being 0.742. This indicated that more than 50% of the variance in the items could be explained by the variables associated with them, in line with the recommendations of Hair et al. (2019). This high convergent validity indicated that the items in each variable were closely related to each other and effectively measured the same construct. The analysis results of the variable measurements used in this study showed a high level of reliability and validity, providing a strong basis for further analysis. Next, the researcher carried out a discriminant validity test (See Table 3).

Table 3. Discriminant Validity (Heterotrait-monotrait ratio (HTMT))

	Quality of Information Systems	Use of the E-Kinerja Application	SCA Work productivity	Digital Transformation
Quality of Information Systems				
Use of the E-Kinerja Application	0.844			
SCA Work productivity	0.853	0.832		
Digital Transformation	0.787	0.857	0.819	

In this research, discriminant validity was a critical aspect that needed to be considered to ensure that the constructs measured in the PLS-SEM model were unique and distinguishable from each other. HTMT analysis in Table 3 confirmed that all variables (information system quality, the use of E-Kinerja application, SCA work productivity, and digital transformation) had sufficient discriminant validity. All HTMT values were below the threshold of 0.90 proposed by Hair et al. (2019), which showed that each variable in the model measured a different construct and had clear differences from each other. This was important to ensure the conceptual integrity of the research model and the reliability of the interpretations resulting from the PLS-SEM analysis.

The computational results presented in Figure 2, Table 2, and Table 3 show that the measurement model in this study was valid and reliable.

Structural Model

Before testing the research hypothesis, the first step the researchers took was to test multicollinearity. In the Partial Least Squares Structural Equation Modeling (PLS-SEM) model applied in this study, it was important to check for potential multicollinearity among independent variables, namely the extent to which these variables were linearly correlated with each other. High multicollinearity could cause problems in parameter estimation, making it difficult to interpret the individual effects of predictors in the model. To identify and measure multicollinearity, researchers used the Variance Inflation Factor (VIF), as recommended by Hair et al. (2019). According to their standards, VIF values exceeding 5 indicated potentially problematic multicollinearity, while values below 5 were generally considered not to cause concern. The results of the multicollinearity test could be seen in Table 4.

Table 4. Multicollinearity Test

	Quality of Information Systems	Use of the E-Kinerja Application	SCA Work productivity	Digital Transformation
Quality of Information Systems		1.908	3.977	
Use of the E-Kinerja Application			4.104	
SCA Work productivity				
Digital Transformation	1.000	1.908	2.463	

Based on Table 4, the results of the VIF analysis showed that all VIF values in this model were below the threshold of 5. In particular, Information System Quality had a VIF value of 1.908 in relation to the use of E-Kinerja application and 3.977 to SCA work productivity, which indicated that there was no significant multicollinearity. The use of the E-Kinerja Application was recorded as having a VIF value of 4.104 with SCA Work productivity, close to but not exceeding the recommended upper limit, indicating that the linear relationship between the two was not strong enough to be considered problematic. Furthermore, Digital transformation showed a very low VIF value

for all variables measured, with a value of 1.000 for Information System Quality, 1.908 for E-Kinerja Application Use, and 2.463 for SCA Work productivity. These values indicated that Digital Transformation was highly independent of other variables in the model and there was no concerning multicollinearity that could interfere with the interpretation of the results. Table 4 confirmed that the model used in this study was free from significant multicollinearity problems.

Because the model was free from multicollinearity problems, the researchers next carried out hypothesis testing. The results of the hypothesis test could be seen in Table 5.

Table 5. Hypothesis Testing

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Digital Transformation -> SCA Work productivity (H1)	0.202	0.200	0.043	4.696	0.000
Digital Transformation -> Use of the E-Kinerja Application (H2)	0.330	0.328	0.037	8.911	0.000
Digital Transformation -> Information System Quality (H3)	0.690	0.689	0.043	16.189	0.000
Quality of Information Systems -> The Use of E-Kinerja application (H4)	0.637	0.638	0.035	18.300	0.000
Information System Quality -> SCA Work productivity (H5)	0.116	0.122	0.111	6.438	0.000
Use of the E-Kinerja Application -> SCA Work productivity (H6)	0.589	0.582	0.090	6.572	0.000

Table 5 reveals significant and positive hypothesis test results from a series of relationships between digital transformation, information system quality, and the use of E-Kinerja application on SCA Work productivity. These results showed in detail how each aspect of technology affected work aspects. Digital Transformation showed a strong positive influence on SCA Work productivity (H1), with a path coefficient of 0.202 and T-statistics of 4.696, which was far beyond the significance threshold, as well as a P-value of 0.000 which indicated a very high level of significance. This emphasized the importance of integrating digital technology in daily operations to increase work effectiveness.

Furthermore, Digital Transformation had a significant impact on the use of E-Kinerja application (H2), with a path coefficient of 0.330 and a very high T-statistics, 8.911. The P-value of 0.000 on this relationship showed how important digital transformation was in increasing application utilization which strengthened operational efficiency. In addition, Digital Transformation had a very large influence on Information System Quality (H3), with a coefficient of 0.690 and an impressive T-statistics of 16.189, indicating a very close relationship and improving the quality of technological infrastructure. Information System Quality also had a significant influence on the use of E-Kinerja application (H4), with a coefficient of 0.637 and T-statistics of 18,300. This showed that a quality information system could support application use more effectively. Even though the influence of Information System Quality on SCA Work productivity (H5) was more moderate, the coefficient of 0.116 with T-statistics of 6.438 and P-value of 0.000 still showed a significant relationship, although not as strong as other relationships.

Lastly, the use of the E-Kinerja application had a strong influence on SCA Work productivity (H6), with a coefficient of 0.589, T-statistics 6.572, and P-value 0.000. This confirmed that an effective and integrated application in daily work routines could substantially increase employee productivity. Next, the researchers measured the predictive power of the variables used in this research by looking at the coefficient of determination (R^2), effect size (F^2), and predictive relevance (Q^2). The results of this measurement could be seen in Tables 6, 7, and 8.

Table 6. Coefficient of Determination (R^2)

	R-square	R-square adjusted
Information System Quality	0.476	0.474
Use of E-E-Kinerja application	0.804	0.802
SCA Work productivity	0.734	0.731

Table 7. Effect Size (F^2)

	Information System Quality	Use of E-E-Kinerja application	SCA Work productivity	Digital Transformation
Information System Quality	-	1.085	0.265	-
Use of E-E-Kinerja application	-	-	0.256	-
SCA Work productivity	-	-	-	-
Digital Transformation	0.908	0.291	0.063	-

Table 8. Predictive Relevance (Q^2)

	Q^2 predict	RMSE	MAE
Information System Quality	0.469	0.739	0.562
Use of E-E-Kinerja application	0.588	0.651	0.521
SCA Work productivity	0.534	0.701	0.528

Based on Table 6, the coefficient of determination, or R^2, is an important metric that measures the percentage of variation in the dependent variable that is explained by the independent variables in the model. According to Hair et al. (2019), a higher R^2 value indicates a stronger model. For this study, the R2 value for Information Systems Quality was 0.476 and the adjusted R2 was 0.474, indicating that approximately 47.6% of the variation in Information Systems Quality could be explained by independent variables. E-Kinerja Application Usage and SCA Work productivity showed very high R^2 at 0.804 and 0.734, respectively, indicating a strong explanation by the model.

The above results underscore the robustness of the model used in this study, suggesting that the independent variables are significant predictors of the dependent variables. The R^2 values for E-Kinerja Application Usage and SCA Work Productivity indicate that the model explains a substantial portion of the variance in these constructs, reflecting the effectiveness and relevance of the predictors chosen. This is particularly significant in practical terms, as it highlights the model's utility in predicting key outcomes related to information systems and productivity measures. The high R^2 values align with the guidelines

proposed by Hair et al. (2019), which suggest that values above 0.7 are indicative of strong models in social science research, further validating the reliability of the study's findings and the efficacy of the E-Kinerja application in improving work productivity.

In terms of Effect Size (F^2) displayed in Table 7, this metric measures the relative influence of each independent variable on the dependent variable. Hair et al. (2019) explained that an F^2 value greater than 0.02 is considered to have a small effect; more than 0.15 has a moderate effect; and more than 0.35 is considered to have a large effect. In the context of this research, F^2 for Information System Quality on the Use of the E-Kinerja Application was 1.085, indicating a very large effect, while the effect on SCA Work productivity was 0.265, a medium effect. The use of the E-Kinerja Application had an F^2 of 0.256 on SCA Work productivity, also indicating a moderate effect.

These F^2 values provide critical insights into the specific contributions of each independent variable within the model. The very large effect of Information System Quality on the Use of the E-Kinerja Application (F^2 = 1.085) underscores the pivotal role that high-quality information systems play in enhancing the functionality and adoption of digital tools within an organization. This large effect size suggests that improvements in information system quality could lead to significant increases in the effective use of the E-Kinerja application, thereby maximizing its potential benefits. Conversely, the moderate effect sizes of Information System Quality and the Use of the E-Kinerja Application on SCA Work Productivity (F^2 = 0.265 and F^2 = 0.256, respectively) highlight the substantial, yet not overwhelming, impact these factors have on productivity. This indicates that while they are important, other variables might also be contributing to work productivity, suggesting a multifaceted approach to enhancing productivity outcomes. These findings reinforce the need for a balanced focus on both technological infrastructure and application usage to achieve optimal productivity improvements.

Next in Table 8, Predictive Relevance (Q^2) measures the model's ability to make predictions, which is important for the external validity of the model. Q^2 values greater than zero, as described by Hair et al. (2019), shows that the model has predictive relevance. The Q^2 value for Information System Quality was 0.469, Use of the E-Kinerja Application was 0.588, and SCA Work productivity was 0.534, all indicating that this model was effective in predicting the outcome of the dependent variable.

These Q^2 values are significant as they validate the model's predictive capabilities, ensuring that it is not merely fitting the data well but is also capable of making accurate predictions in different contexts. The high Q^2 values,

particularly for the Use of the E-Kinerja Application (0.588) and SCA Work Productivity (0.534), underscore the model's robustness in forecasting outcomes based on these constructs. This predictive relevance implies that the model can reliably be used to guide decision-making and strategic planning within organizations, as it demonstrates a strong ability to predict key performance metrics. Moreover, the Q^2 value of 0.469 for Information System Quality suggests a considerable predictive power, reinforcing the importance of high-quality information systems in achieving desired performance outcomes. The consistency of these values across different constructs highlights the comprehensive strength of the model, ensuring its applicability in various organizational settings and enhancing its external validity. This further supports the notion that the integration and effective use of applications like E-Kinerja, coupled with high-quality information systems, are crucial for improving work productivity and achieving organizational goals.

The essence of this analysis is that the conceptual model of this research has succeeded in explaining and predicting the variables involved very effectively, based on the established thresholds and the theory outlined by Hair et al. (2019). With a high level of explanation, significant effect size, and strong predictive ability, this model provides validity and reliability in explaining the relationship between digital transformation, information system quality, the use of E-Kinerja application, and SCA work productivity. This model has proven to be a powerful tool for exploring dynamics in higher education organizations and assists in implementing more targeted strategies based on the results of the analysis.

Discussion

This research examined the interactions among digital transformation, information system quality, the use of E-Kinerja application, and SCA work productivity at IAIN Curup using PLS-SEM based modeling. The results of hypothesis testing showed that digital transformation had a significant positive influence on SCA work productivity with a path coefficient of 0.202 (H1) and T-statistics of 4.696 (H1). This high significance (P-value 0.000 (H1)) confirmed that the integration of digital technology in daily operations increased work effectiveness. This transformation includes not only the adoption of digital tools, but also changes in work processes that take advantage of new technologies. Referring to change management theory, successful digital transformation requires effective adaptation to change (Pencheva et al., 2020). These results indicate that these adaptations have been successfully implemented, increasing work effectiveness through the use of technology. This confirms that SCAs involved in digital transformation have the necessary tools to improve their performance, which is consistent with the principles of this

theory which emphasizes the importance of technology adaptation and adoption in improving work outcomes.

The influence of Digital Transformation on the Use of the E-Kinerja Application was very significant, with a path coefficient of 0.330 (H2) and T-statistics of 8.911 (H2). This large effect (P-value 0.000 (H2)) showed how important digital transformation was in facilitating the use of applications that strengthened operational efficiency. This data shows that digital transformation serves as a catalyst that enables and increases the use of E-Kinerja application. Technology Acceptance Theory (TAM) is very relevant here, because this theory proposes that technology acceptance by users depends on their perception of usefulness and ease of use (Marikyan & Papagiannidis, 2023). A high coefficient in this context indicates that applications developed as part of a digital transformation initiative are perceived as useful and easy to use by SCAs, thereby increasing their adoption.

The importance of information system quality in supporting the effective use of the E-Kinerja application was also reflected in the results with a path coefficient of 0.690 (H3) and a very high T-statistics of 16.189 (H3). This relationship suggests that high-quality technology infrastructure is key to effective technology utilization. This emphasizes the importance of investing in the development and maintenance of reliable information systems. In this context, the principles of information systems theory emphasize that an integrated and well-designed system can improve the ability of applications to support work tasks, indicating that the quality of information systems directly influences the use and effectiveness of applications (Nguyen et al., 2021).

Information system quality had a significant influence on the use of E-Kinerja application, with a coefficient of 0.637 (H4) and t-statistics of 18.300 (H4). This showed that a quality information system could support application use more effectively (p-value 0.000 (H4)). Even though the influence of information system quality on SCA work productivity was more moderate, the coefficient of 0.116 (H5) with t-statistics 6.438 (H5) and p-value 0.000 (H5) still showed a significant relationship, although not as strong as other relationships. The diffusion of innovations theory and the technology acceptance model explain that factors such as perceived usefulness and ease of use which are enhanced by high quality information systems can accelerate technology adoption (Chatterjee et al., 2021). However, psychological and organizational factors also play a role in increasing productivity, underscoring the importance of a holistic approach in research and implementation of information technology in the work environment (Bai & Vahedian, 2023).

Finally, the success of using the E-Kinerja Application in increasing SCA Work productivity, with a strong path coefficient of 0.589 (H6) and T-statistics of 6.572 (H6), confirmed the importance of application integration in daily work routines (P-value 0.000 (H6)). The influence of the E-Kinerja application on SCA Work productivity can be understood through various theoretical lenses, such as the Job Involvement Theory which states that effective and task-appropriate applications can increase worker involvement and productivity (AlMazrouei, 2022). However, from the perspective of Job-Technology Fit Theory, the match between an app's design and job needs is key to its effectiveness (Schmid & Dowling, 2022). In contrast, Technological Strain Theory highlights that complex or less intuitive applications can increase stress and reduce productivity, suggesting that poor application design can have negative impacts (Wang et al., 2023). In addition, Technology Readiness Theory highlights that not all workers are ready to adopt new technology, which can limit the effectiveness of applications in increasing productivity (Kaushik & Agrawal, 2021). Although the data shows a strong relationship between the use of E-Kinerja application and increased productivity, factors such as design, user adaptation, and technology stress need to be considered to fully understand the dynamics involved. In conclusion, successful application integration requires not only the application of technology but also a deep understanding of the interactions between technology, human factors, and the organization.

The novelty of this research lies in its comprehensive examination of the conceptual model representing the interplay among digital transformation, information system quality, the use of the E-Kinerja application, and SCA work productivity at IAIN Curup using PLS-SEM based modeling. This study uniquely demonstrates how digital transformation not only directly enhances work productivity but also significantly facilitates the adoption of digital tools like the E-Kinerja application. The findings reveal that high-quality information systems are crucial for effective technology utilization, providing empirical support for the integration of information systems theory and Technology Acceptance Model (TAM) in understanding technology adoption and its impact on productivity. Furthermore, the research highlights the moderating role of human factors and organizational dynamics, offering a holistic view of the factors influencing the success of digital transformation initiatives. This integrated approach, combining multiple theoretical perspectives and empirical evidence, offers novel insights into the mechanisms through which digital tools and systems enhance organizational productivity.

The results of this research provide significant practical implications for IAIN Curup and other universities in the context of digital transformation. First, the adoption of digital technology which has been proven to increase the

productivity of SCA performance shows the need to strategically integrate digital tools in daily operations. Especially for IAIN Curup, this could mean improvements in academic and non-academic administrative management systems that are more automated and integrated. Second, the positive influence of digital transformation on the use of E-Kinerja application underscores the importance of developing applications that are not only technologically sophisticated but also user-friendly, making it easier for SCA to carry out their duties more efficiently. Third, investment in the quality of information systems is key, not only in the context of technical maintenance, but also in system design that supports the specific needs of end users. For higher education in general, this means expanding IT infrastructure that supports innovation in teaching and learning and administration. Effective use of E-Kinerja application, which has been proven to increase productivity, must be accompanied by adequate training and sufficient resources to ensure that all staff gain maximum benefit from this technology. Specifically, at IAIN Curup, this can facilitate a smoother transition to a more digital approach in all operational aspects, guaranteeing continuous improvements in work effectiveness and user satisfaction.

CONCLUSION

Oriented towards developing a conceptual model representing the interplay among digital transformation, information system quality, the use of the E-Kinerja application, and SCA work productivity, the PLS-SEM analysis demonstrated that all six formulated hypotheses were accepted. This research concludes that in the context of IAIN Curup, Digital Transformation positively influences SCA Work productivity (H1) with a path coefficient of 0.202 and T-statistics of 4.696, confirming the importance of technology adoption and integration in daily work routines. The impact of digital transformation on the use of the E-Kinerja application (H2) and on the quality of information systems (H3) is very strong, with path coefficients of 0.330 and 0.690 respectively, showing how fundamental digital transformation is in improving technology infrastructure and effective application use. The influence of information system quality on the use of the E-Kinerja application (H4) is also significant with a coefficient of 0.637 and T-statistics of 18.300, confirming the importance of good information system quality for effective technology use. Although the direct influence of information system quality on SCA Work productivity (H5) is more moderate, it is still significant, showing that a good system supports efficient productivity. Lastly, the use of the E-Kinerja Application on SCA Work productivity (H6), with a coefficient of 0.589 and T-statistics of 6.572, confirms that effective application integration greatly enhances performance output. The novelty of this research lies in its comprehensive examination of

how digital transformation, supported by high-quality information systems and effective application use, enhances work productivity in higher education institutions. This study not only validates the critical role of technology in improving operational efficiency but also provides a practical framework for other universities. Future research should explore moderating factors such as organizational culture, technology readiness, and resistance to change, and conduct comparative studies assessing various E-Kinerja technologies across different university settings. Investigating the long-term impacts of digital transformation on organizational performance, including staff satisfaction and retention, and analyzing how information system quality affects operational efficiency will further guide the optimal integration of technology solutions in university operations, significantly contributing to the development of higher education.

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