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Determinants of User Acceptance of the Digilib Application at the UIN Sunan Kalijaga Yogyakarta Library

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ABSTRACT

The Digilib application represents an innovative library service aimed at extending access to a wider community. However, its utilization remained low, prompting this study to examine the factors influencing the acceptance of digital library technology. This research employed a quantitative design with a correlational approach, analyzing data collected from 68 Library Science students at UIN Sunan Kalijaga Yogyakarta through questionnaires. The primary data were processed using SmartPLS 3 to evaluate dimensions of the Technology Acceptance Model (TAM), including Perceived Ease of Use, Perceived Effectiveness, Attitude Toward Use, Behavioral Intention to Use, and Actual System Usage. The findings revealed that user acceptance of the Digilib application was significantly influenced by factors such as Digilib's branding, its flexibility in integrating with external information sources, the quality of information provided, and its user-friendly design. Enhancing these aspects could improve the adoption rate of the Digilib application, thereby enabling libraries to achieve their goal of extending services to a broader audience.

Keywords: Digital library applications; library service; technology acceptance; users' behaviors

1. INTRODUCTION

The rapid progress of technology has given rise to innovation in various fields and has become an inseparable part of people's daily activities, including in libraries (Danuri, 2019). The expansion and shift in library paradigms began in the 1960s, with the advent of computers and the development of Hypertext Markup Language (HTML) (Dillon & Jul, 2020), especially since the era of the Internet of Things (IoT) with indicators of the application of various artificial intelligence applications in many fields of work (Effendy et al., 2022; Nafisah & Effendy, 2019). Many libraries adapt to technological developments by implementing digital library (Digilib).

Digilib is an application to modernize information access by providing a digital platform that facilitates easy retrieval of library resources, as stated in the Law of the Republic of

Indonesia Number 43 of 2007 concerning Libraries (Alzahrani et al., 2019). Digilib can expand the reach of library services and enable users to access information by providing fast, accurate, efficient, and flexible information services and ensuring the availability of information for all users. Digilib plays an essential role in supporting activities related to academics and research (Si et al., 2019). Digilib allows students and lecturers to access various information sources more efficiently and increase the effectiveness of learning and research by providing fast access to scientific journals, electronic books, and academic databases (Rafique et al., 2021). Thus, Digilib can be a strategic tool for libraries to achieve these goals and ensure all library users can access the information they need. For this reason, the development of Digilib is a library priority with various considerations of urgency based on multiple points of view, including legal, psychological, health, educational, economic, social, and technological perspectives (Nafisah, 2022).

Although Digilib provides maximum ease of access, its acceptance remains suboptimal and relatively low. The issue of the low level of acceptance of the Digilib application by the public is an urgent concern among the library and academic community. The low level of acceptance of Digilib influences the success of libraries in developing Digilib (Pambayun, 2020). For this reason, libraries should investigate the factors affecting user acceptance of technology to address this issue. Experts have developed many theoretical models to assess and evaluate the factors that influence user acceptance of the application of new technology, one of which is the Technology Acceptance Model (TAM). Davis introduced TAM in 1989, focusing on two main factors influencing technology acceptance: benefits and ease of use (Ahmad, 2018; Koul et al., 2018; Rafique et al., 2020). Researchers have widely used the TAM model to understand the application of various information technologies in multiple contexts, including library services. Several studies support the TAM theory in transmitting user acceptance of library applications. User assessments regarding application usefulness, interactivity, and ease of use significantly influence users' attitudes and intentions to use library applications. These findings demonstrate the robust construction of TAM theory as a model for evaluating library technology-based services (Chen et al., 2016; Yoon, 2016).

Several factors cause the low use of Digilib in the academic circumstances. Among the most significant is the insufficient provision of technical support and infrastructure, which impedes the efficient use of digital library resources (Rubin & Rubin, 2020). Many institutions use information technology without adequately preparing an excellent digital infrastructure, thus making it difficult for users to access and navigate digital libraries efficiently (Azwar et al., 2020; Halim et al., 2019; Hamzah et al., 2022; Ratnawati et al., 2020). In addition, factors that hinder the effective implementation of Digilib are the lack of digital awareness and literacy among users, including students and lecturers. Lack of socialization, education about how to use the Digilib application, and low digital skills among users are several factors that contribute to the low acceptance of the Digilib application. Psychological factors such as resistance to change also play an essential role in the low acceptance of Digilib (Abdul Rahman & Mohezar, 2020). User habits with conventional methods of using library services tend to resist the application of new technology. This traditional habit includes the physical use of the library and its collections in the form of printed collections, becoming an ingrained habit. These habits make it difficult for library users to utilize digital resources and require a change in mindset, which is a challenge for many users.

One of the universities implementing Digilib is UIN Sunan Kalijaga Yogyakarta Indonesia. People can access this application through this link https://lib.uin-suka.ac.id/. Since 2007, this university has implemented a comprehensive digital library application to facilitate access to

digital collections and knowledge transfer among the academic community. This application hosts various digital content, such as undergraduate theses, master's theses, dissertations, research reports, articles, and other educational publications created by its scientific community. The Digilib UIN Sunan Kalijaga Yogyakarta also supports the library's efforts to provide broader and more modern services to its users while increasing user involvement by offering a digital platform that facilitates easy retrieval of library resources. The library hopes that ease and speed of access to information can support the effectiveness of learning and research in the academic environment. However, the utilization level of this university's Digilib application is still low. Based on statistical reports, from May 2012 to January 2024, users downloaded 52,487,359 articles through this application (Perpustakaan UIN Sunan Kalijaga Yogyakarta, 2024a). Based on this data, the average user of this application downloads 372,250 articles every month. Based on this data, the number of users of the Digilib application is an average of 20 students every month.

The current study explores aspects that influence the acceptance of digital library technology by conducting an in-depth exploration of the factors using the Technology Acceptance Model (TAM). This research contributes to identifying factors that influence user acceptance of the Digilib application so that libraries can focus Digilib development on aspects that can significantly support and increase user acceptance. This research can also be a reference for organizations that utilize technology-based innovation as an organizational strategy to achieve goals effectively by focusing on strengthening aspects that influence user acceptance of new technology.

2. METHODS

This research used quantitative research methods with a correlational design to identify factors that influence the acceptance of the Digilib application in the UIN Sunan Kalijaga Yogyakarta library. Correlational research is a method that aims to determine the relationship between two or more variables (Bauer et al., 2021; Duckett, 2021; Munda et al., 2020; Novosel, 2022; Thomas & Zubkov, 2023; Zellner et al., 2021).

This research employed primary data collected through questionnaires and secondary data sourced from relevant literature and studies on the research topic. The study population consisted of 608 students from the Library Science program at UIN Sunan Kalijaga, all of whom have experience using the Digilib application and engaging with its digital library ecosystem. From 608 students, with the proportion of the population at 50% and the level of confidence at 10% (Z= 1.96), the number of respondents in this research was 68 based on the following equation (Uakarn et al., 2021).

$$n = \frac{Z^2 p(1-p)}{E^2}$$

This research applied the Technology Acceptance Model (TAM) described in Figure 1. The Technology Acceptance Model (TAM) is a framework that provides a robust theoretical foundation for understanding user acceptance of information systems or technology (Ahmad, 2018; Camilleri, 2018; Ho et al., 2022; Koul et al., 2018).

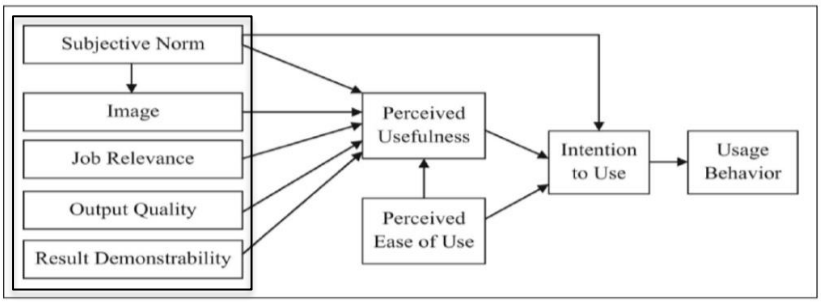

Figure 1. TAM framework
Source : (Ljubicic et al., 2020)

In the TAM, Subjective norm (SN) is a user's assessment of Digilib, which is Product branding (Image), Job Relevance (JR), Output Quality (OQ), and Result Demonstability (RD) influence. The Image refers to how Digilib can increase students' social status in their environment (Hwei et al., 2022). JR relates to Digilib's ability to help students complete academic assignments. OQ refers to students' perceptions of the quality of Digilib information. RD shows how students can use Digilib output. When students get the benefits of Digilib, they are more likely to continue using the app (Intention of Use (IU)). SN influences perceived usefulness (PU) and the Perceived Ease of Use (PeU) of Digilib users. PU assesses how confident students are in using Digilib. PEU assesses the user's belief in the ease of use of Digilib. PEU shapes sustainable Digilib usage behavior (UB).

Data analysis in this study used the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique using SmartPLS software as a statistical tool, as shown in Figure 2 (Memon et al., 2021). This analysis aimed to determine the relationship between TAM aspects and acceptance of the Digilib application among students by calculating the correlation coefficient using the product moment correlation formula. The critical point for the influence of the correlation coefficient is 0.5. If the computed coefficient is > 0.5, this aspect significantly influences the acceptance and use of the Digilib application. This research uses a correlation coefficient range of 0-1, as shown in Table 1.

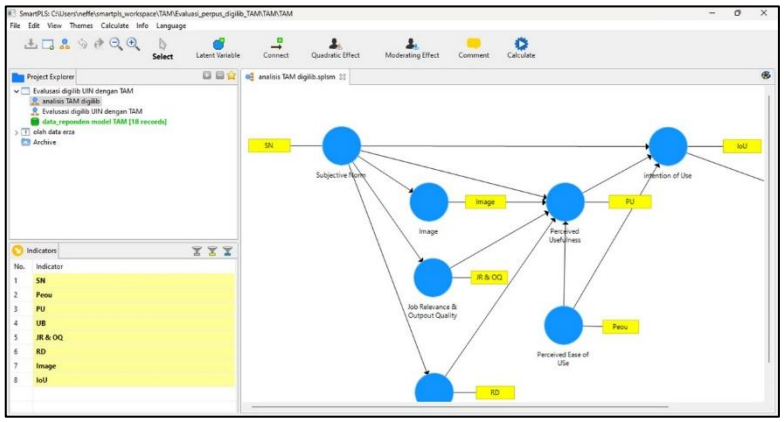

Figure 2. Interface of SmartPLS software

Table 1. Correlation coefficient range

Coefficient range	Interpretation
0.01 – 0.19	no correlation
0.20 – 0.39	very low correlation
0.40 – 0.59	low correlation
0.60 – 0.79	high correlation
0.80 – 0.99	very high correlation
1	perfect correlation

Source : (Baak et al., 2020)

3. RESULTS AND DISCUSSION

UIN Sunan Kalijaga Library began pioneering the Digilib application in 2007. The Digilib initially functioned as a digital file storage and collection application using the Ganesha Digital Library (GDL) application. GDL is a digital library software developed by the Knowledge Management Research Group (KMRG) Institute of Technology Bandung. This application has features for managing, utilizing, and distributing digital collections owned by the library. GDL operation requires Apache as a database, web server, and MySQL for database management. GDL also utilizes the Open Archive Initiative Protocol for Metadata Harvesting (OAI-PMH), which supports the Network of Networks (NeONs) architecture.

In 2012, the library replaced the GDL with the Eprints application. School of Electronics and Computer Science, University of Southampton, England, United Kingdom, developed open-source software, Eprints, as a repository application for library collections in the form of archives of research papers, journals and images, research data, and sound in digital format. EPrints has standardized metadata so libraries can integrate Eprints applications with other metadata. Eprints also provides advanced search features and other features.

In 2015, the Digilib of UIN Sunan Kalijaga collection had more than 16,000 digital collections and was ranked fifth in the Webometrics repository for Indonesia (Ahwan, 2020). The Digilib application of the Library provides information services from internal and external sources. This library provides information services from internal sources stored in the institutional repository (IR). In contrast, information services from external sources come from local e-journals and e-book and e-journal databases subscribed to by this library. This library also provides disabled access services through its Digilib application. Figure 3 shows the interface of the Digilib application at UIN Sunan Kalijaga Yogyakarta.

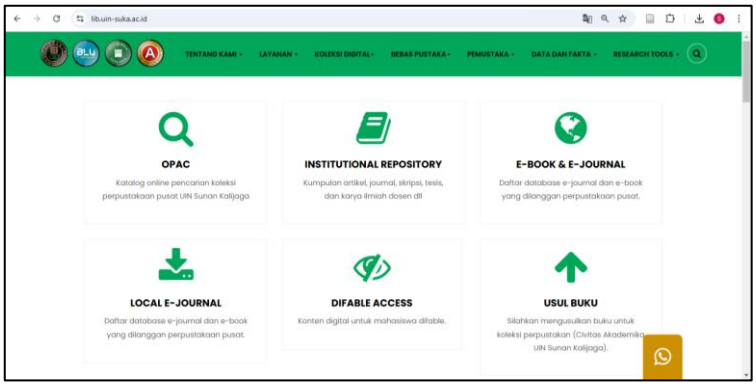

Figure 3. Interface of Digilib of UIN Sunan Kalijaga Yogyakarta

In its IR, the library has owned of 65,232 digital collections. The library stored these collections in various formats. Table 2 shows details of digital collections stored in the IR of this university library.

Table 2. The IR of UIN Sunan Kalijaga Yogyakarta digital collections

Type of Collection	Number
Articles	3184
Book Section	1240
Monograph	404
Conference or Workshop Item	255
Book	986
Thesis	58965
Patent	40
Image	48
Video	15
Audio	1
Experiment	10
Teaching Resources	2
Other	82

Source : (Perpustakaan UIN Sunan Kalijaga Yogyakarta, 2024b)

The Digilib also provided information services using collections from external sources. The library has subscribed e-books and e-journals and provided collection services through its services. Figure 4 displays external information sources subscribed to by the UIN Sunan Kalijaga Yogyakarta library and served to its users via the Digilib application.

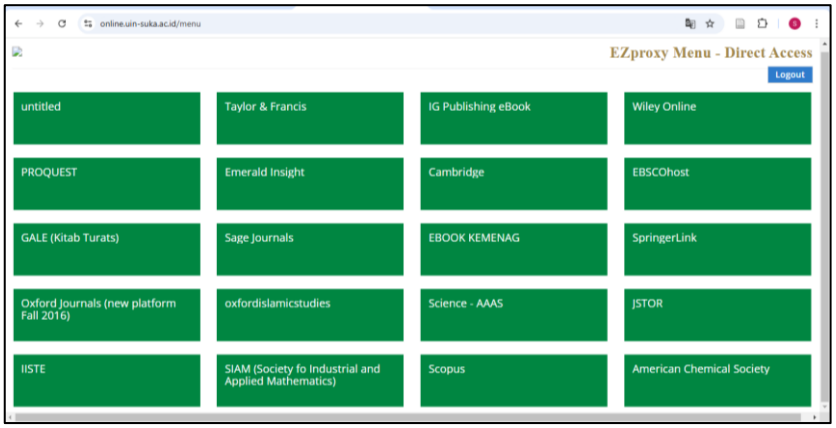

Figure 4. External collection sources of the UIN Sunan Kalijaga Yogyakarta Library

Even though it has provided many and varied digital collections, the level of use of this application was still relatively low, as previously mentioned. Even the university's high webometrics ranking did not indicated the high use of the Digilib application. For this reason, this research explored the in-depth factors that influence user acceptance of the Digilib application at UIN Sunan Kalijaga Yogyakarta. This section presents field findings regarding the factors that influence the acceptance of Digilib at the UIN Sunan Kalijaga Yogyakarta Library using the TAM with its five dimensions to evaluate user acceptance of this application.

Based on the TAM framework, as seen in Figure 1, this research conducted a path analysis of the framework to describe the operational research variables using Partial Least Squares Structural Equation Modeling (PLS-SEM). Analysis of factors in the TAM model in this research applied path analysis using SmartPLS 3 software to measure and test the strength of the relationship between TAM variables and Digilib acceptance at UIN Sunan Kalijaga. Figure 5 shows a visualization of the path analysis of variable operationalization in this research.

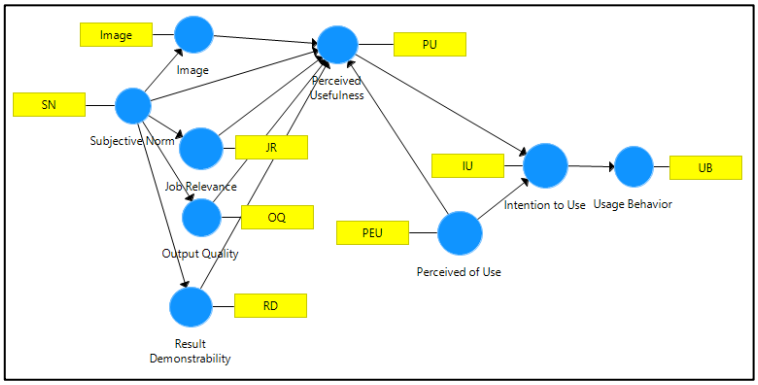

Figure 5. Visualization of path analysis factors

This research collected data by distributing questionnaires to respondents. After recapitulating respondents' answers, this research calculated the correlation coefficient using the Product Moment correlation (CPM) formula to analyze respondents' responses to the Digilib application at the UIN Sunan Kalijaga Yogyakarta Library. Figure 6 shows the correlation coefficient for each factor influencing other factors in this research.

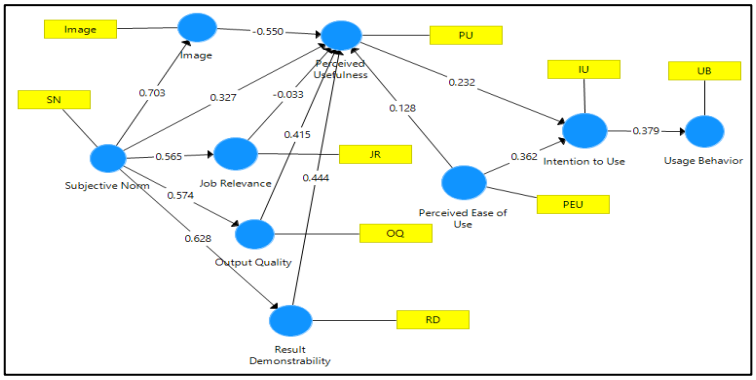

Figure 6. Coefficient correlation of TAM factors

Table 3 shows the correlation coefficient of SN on factors that influence user assessment of the Digilib application, and Table 4 shows the correlation coefficient of the influence of SN on PU based on Figure 1. Figure 7 shows the correlation coefficient between sub-variables in the TAM.

Table 3. SN coefficient on factors influencing the use of Digilib

Variables	Sub Variables	CPM
SN	Image	0.703
	JR	0.565
	OQ	0.574
	RD	0.628

Table 4. The correlation coefficient of the influence of SN on PU

Variables	Sub Variables	CPM
SN	Image	-0.550
	JR	-0.033
	OQ	0.415
	RD	0.444
SN → PU		0.327

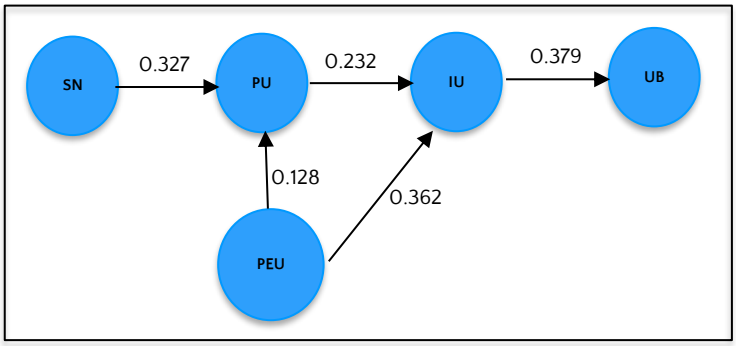

Figure 7. Coefficient Correlation of TAM Factors

After calculating the correlation coefficient value, this research calculated the coefficient of determination (R^2) to find out how strong the influence of the independent (exogenous) factors is on the dependent (endogenous) variable. The coefficient of determination becomes a predictor model to determine how independent factors influence dependent factors. This research also calculated Adjust R Square (R^2 Adjustment) to estimate the accuracy of the predictor model. This research also analyzed to predict how the results will accept or reject the research hypothesis by calculating the P-value. Table 5 shows the results of the R2 and R2 Adjustment calculations for factors influencing using new applications/technology in TAM. Table 6 shows the result of calculating the P-value of TAM factors.

Table 5. R^2 and R^2 adjustment of TAM

TAM Aspect	R^2	R^2 adjustment
Image	0.494	0.473
IU	0.267	0.203
JR	0.320	0.291
OQ	0.329	0.301
PU	0.478	0.313
RD	0.394	0.369
UB	0.143	0.108

Table 6. The P-value of TAM Factors

TAM Aspect	P-Value
Image	0.244
JR → PU	0.918
OQ	0.309

RD			0.102
PU	→	IU	0.218
PEU			0.736
IU	→	UB	0.143

Trust or Subjective Norm (SN) is an aspect that influences user acceptance of new technology in the TAM. There are four factors influencing user confidence in using new applications or technology; the first is product branding (Image), suitability to job requirements (JR), product quality (OQ), and application benefits (RD). In this research, as shown in Table 2, UIN Sunan Kalijaga students assessed that the Image or Branding of the Digilib application influenced the level of user confidence in using this application. The correlation coefficient between Digilib Branding and Trust in using this application was 0.703. This coefficient value shows a significant influence. The Suitability of the Digilib application as an application that can help users complete their work also showed a considerable influence on user confidence in using the Digilib application. In this context, Digilib's ability to assist in completing assignments refers to Digilib's ability to fulfill information needs to complete students' academic assignments.

The correlation coefficient of Job Suitability on user confidence using the Digilib application showed a coefficient of 0.565. Based on user assessments, the quality of the information produced also influenced user confidence in using the Digilib application, with a correlation coefficient of 0.574. This value showed a significant influence. Likewise, the benefits aspect of the Digilib application showed a coefficient value of 0.628, which means that the benefits aspect greatly influenced user confidence in using the Digilib application. The coefficient value for each element, 0.565 – 0.703, showed that the calculated coefficient was > 0.5. This analysis indicated that Image, Job Relevance, Output Quality, and Result Demonstratability significantly influenced User Subjective Norms or user Trust in the Digilib application.

Based on the model, user Trust in an application (SN) influenced the user's perception of the usefulness of an application or technology product. The study analyzed respondents' responses regarding the influence of Trust in the Digilib application on the Usability of Digilib. Based on the data in Table 3, it showed that the coefficient of user Trust (SN) in the Usability (PU) of the Digilib application is 0.327. This calculated coefficient value showed a coefficient value of 0.327 < 0.5. This coefficient indicated that user trust in the Digilib application did not influence the user's decision to use the Digilib application. The low correlation between SN and PU was because the user's assessment of the Image or Branding of the Digilib application of the library showed a low and negative correlation value, scoring -0.550. User assessment of the Suitability of the Digilib application in assisting user tasks also indicated a low and negative influence with a correlation value of -0.033. As for the influence of the Information Quality and Benefits of the Digilib application on the assessment of the usefulness of this application, although it showed a positive coefficient value, it showed a calculated coefficient of <0.5. The correlation coefficient for the Information Quality aspect showed a value of 0.415, and the Digilib application's benefits showed a coefficient value of 0.444.

The respondents stated to the ease of use of the Digilib (PEU) application. The correlation coefficient between PEU and PU shows a coefficient value of 0.128. Figure 4 shows the results of the analysis of the influence of the PEU coefficient on PU. This coefficient value showed the influence of user ease in using the Digilib application on its Usability. PEU also influenced user Intention (IU) to use the Digilib application, with a correlation value of 0.362. This coefficient

value showed that the user's ease in using the Digilib application influences the user's desire to use the Digilib application. The PEU coefficient on IU is greater than the PEU coefficient on PU. These results showed that an application design that is easy for users to understand can increase users' desire to use the Digilib application. Based on respondents' responses regarding this assessment aspect, the obstacle for users in using the Digilib application is using language unfamiliar to most users.

Figure 5 also shows the calculation of the coefficient of influence of the Usability of the Digilib application (PU) on the user's Intention to use Digilib (IU). The PU calculation coefficient on IU showed a correlation value of 0.232, and the influence of Intention to Use (IU) on Usage Behavior (UB) was 0.379. Even though the correlation coefficient value was <0.5, this value showed a positive influence. These results showed that the higher the calculated coefficient value for each assessment aspect, the greater the use of the Digilib application.

This research also calculated the coefficient of determination (R^2) for each aspect in the TAM and the adjusted R^2. The R^2 calculation predicted the significant influence of each element of user application acceptance. In contrast, the R^2 adjustment calculated the degree of confidence in the predictor model. Based on Table 4, the predicted influence of the Image aspect on the acceptance of the Digilib application was 49.4%, with a degree of confidence in the prediction results of 47.3%. This predicted value was relatively high, which indicates that Digilib's Image or Branding will influence user acceptance of this application. The expected influence of Intention to Use on the approval of the Digilib application was 26.7%, with a level of confidence in the predicted results of 20.3%. This predictive value showed that the Intention to Use the Digilib application has a low predictive value, which can increase user acceptance of the Digilib application. The Job Relevance showed a predicted value of 32%, with a confidence level in the expected value of 29.1%.

The data analysis also showed that the expected quality of the output of the Digilib application regarding the acceptance of this application was 32.9%, with a confidence level in the prediction results of 30.1%. The application produced a prediction value of 47.8% with a confidence level of 31.3%. The prediction results significantly influenced users' acceptance of the Digilib application, such as the Image aspect. The Benefits of the Digilib application influenced the acceptance of the Digilib application, with a prediction effect of 39.4% and a confidence level in the prediction results of 36.9%. Meanwhile, the last aspect, namely Usage Behavior, showed a prediction value of 14.3% with confidence in the prediction results of 10.8%. This aspect has the lowest predictive value compared to other elements.

After calculating the degree of trust (R^2 Adjustment) on the prediction results (R^2), this research also calculated the P-value. The data in Table 5 shows aspects of the TAM with a P-value > 0.5, namely the Job Relevance (JR) element for assessing the usefulness of the Digilib application by users and Ease of Use (PEU) for the user's Intention to use the Digilib application with a P-Value of 0.918 and 0.736. This P-value showed that JR has a powerful influence on PU, while PEU on IU strongly influences users' acceptance of the Digilib application.

The results of the P-value calculation also showed a relatively strong influence on the Information Quality on the assessment of the usefulness of the Digilib application, with a P-value of 0.309. Elements that showed a weak influence were the influence of Image on application usability with a P-value of 0.244, PU on IU of 0.218, IU on UB of 0.143, and the weakest influence was RD on PU with a P-value of 0.102.

Based on the results of this analysis, libraries can develop or improve the Digilib application by focusing on developing features that suit user needs and meet their information

needs. Apart from that, designing an interface that is easy for users to understand can also increase user acceptance of the Digilib application. The use of familiar terms will help users understand the use of this application so that it can increase user acceptance of it. Libraries can also improve the Digilib application by developing interface design, technology, and quality that can enhance the Image of the information in this application so that user acceptance of this application can increase. The benefits of the application and the users' Intention to use the application have a weak influence on users' acceptance of the Digilib application.

Apart from the findings above, libraries need to conduct more in-depth exploration to evaluate the usefulness of the Digilib application. This research focuses on aspects influencing users' decisions to use the application. Evaluation of the effectiveness of the Digilib application will guide libraries in finding the features and forms of information needed by users. By knowing the needs of its users, libraries will be able to improve the quality of their services by expanding the reach of their services to the public through Digilib.

4. CONCLUSION

The technological era necessitates that libraries innovate by developing services rooted in information technology. Among the primary innovations is the implementation of Digilib, which represents a strategic effort by libraries to overcome barriers that limit user access to library services. However, in this study, the utilization rate of the Digilib application remains relatively low. As a contemporary innovation, libraries must devise development strategies to enhance the adoption and effectiveness of Digilib as a medium for disseminating library information. One of Digilib's key advantages lies in its flexibility, which positions it as a leading application in library service innovation.

The findings reveal that the Subjective Norm—or users' trust in Digilib—significantly influences their decisions to adopt or reject the application. Key factors affecting the Subjective Norm include Digilib's branding, its relevance in fulfilling information needs, the quality of information it provides, and its perceived benefits. Among these, Job Relevance emerges as the most influential factor, followed by Ease of Use. While the Quality of Information has a moderate impact, weak branding diminishes users' likelihood of utilizing Digilib.

Based on these insights, this research recommends that libraries prioritize enhancing Digilib by integrating features that address users' information needs and designing an intuitive interface suitable for general users. Additionally, libraries should focus on curating high-quality information sources to position Digilib as a reliable medium for fulfilling user demands. To further improve, libraries are encouraged to conduct user surveys to identify specific features required to better meet their informational needs.

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Authors' contributions

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