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Developing Compliant Audit Information System for Information Security Index: A Study on Enhancing Institutional and Organizational Audits Using Web-based Technology and ISO 25010:2011 Total Quality of Use Evaluation

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***Abstract*—This study aimed to develop the KAMI 4.1 Index system application based on web application technology to provide a platform for controlled audit implementation and improve data management. The primary goals were to independently assess organizations' ability to obtain ISO 27001:2013 and enhance the audit process's effectiveness and efficiency. The research utilized web application technologies as materials. It employed a systematic approach, focusing on developing a web-based application using the waterfall model's stages of communication, planning, modeling, construction, and deployment. The resulting KAMI 4.1 Index system application introduced a new and efficient platform for controlled audit implementation, featuring an improved user experience and enhanced ease of use by incorporating existing audit calculations from the KAMI 4.1 index. Evaluation based on the ISO 25010:2011 quality of use model yielded a high total quality of use rate of 81.45%, indicating a "very good" categorization. However, areas requiring further research and improvement were identified, including data security, content coverage, freedom from risk, and error tracking. The study also suggested exploring integration possibilities of the audit system with other ISO audit needs, such as a quality assurance system complying with ISO 9001. Further research is necessary to gather information about user criteria and needs in different organizational contexts, ensuring the audit application system meets their requirements. Overall, this research contributes to developing the KAMI 4.1 Index system application and highlights directions for further enhancement and exploration in controlled audit implementation and data management.**

***Keywords*— IT audit; information security; quality in use; ISO 27001; ISO 25010.**

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I. INTRODUCTION

Information technology has become integral to the operations of numerous organizations and companies, driving efficiency and effectiveness in various aspects of business [1]–[3]. Particularly in the realm of auditing, information technology plays a crucial role in ensuring the accuracy and reliability of internal controls [4]–[7], especially in information security, where information technology is reliable and accurate to support business operations [8], [9], especially in the field of auditing [10]. Internal control and information security staff must coordinate the design, implementation, and operation of standard procedures to safeguard the organization's information resources [11]. Internal audits, meanwhile, offer feedback on the success of initiatives to make recurring improvements [11]. Organizations must maintain control over information security to safeguard organizational resource data [12] and thwart threats inside and outside the company [13].

Internal information security control implementation is a challenging process that can alter an organization's state. It can also have adverse effects if not adequately managed and controlled [14]–[16]. As a result, risk management and information technology governance heavily rely on internal control over information security. Traditional audit methods, depending on checklists and questionnaires, often fall short in providing comprehensive evaluations of information security standards and their practical applications [17]. However, one of the significant challenges to internal control is that it requires more than just recording and listening to be accurate. It also involves evaluation and documentary evidence. A

suitable solution is therefore necessary to implement an internal control assessment effectively. Technology-mediated solutions are imperative to bridge the gap. In this context, the research aims to address this challenge by developing the KAMI 4.1 Index System, a web-based audit application built on ISO 27001:2013 criteria. The objective is to facilitate controlled audit implementations, enhance user experience, and improve organization data management.

A. Information Technology in The Audit Process

For the auditors to perform better, they need the appropriate practical methodology [18]. As a result, the auditors can conduct the audit process using information technology [19]. A significant portion of the audit function involves using information technology, mainly when conducting audits, which aims to enhance the auditing procedure [20], [21]. The information technology system's audit components are organized and integrated to correctly complete the assessment process and yield the desired audit benefits [22]. James A. Hall [23] asserts that technological advancements in auditing are inextricably linked to the following functions:

- For internal financial applications to test the accuracy of the data, test data, parallel stimulation, and facilities are used.
- Access electronic files for clients, extract data and run in-depth analyses when looking at audit data and reviewing audit findings.
- System Control Audit Review Files (SCARF) and audit modules identify transaction flows and other audit findings.

B. Information Security Index 4.1 Based on ISO 27001:2013

According to the National Cyber and Crypto Agency [24], An information security index is a tool for determining whether information security will be applied based on ISO 27001:2013 criteria. As shown in Figure 1, this information security index tool includes governance, risk management, a framework, technology asset management, and some other assessments, including securing the participation of third-party service providers, obtaining cloud infrastructure services, and safeguarding personal data.

Fig. 1 KAMI Indicator Index 4.1 [25]

The National Cyber and Crypto Agency [24] states that the purpose of creating the information security index Excel application was not to evaluate the viability and efficacy of the security forms that were already in use. However, it serves as a tool to give a general overview of the readiness state of the information security framework based on elements of ISO 27001:2013, which can be used regularly to get a general sense of changes. Information security requirements resulting from the work schedule and a way to communicate increased readiness to related parties (stakeholders).

The COBIT or CMMI frameworks base the maturity levels used in the KAMI 4.1 index assessment. These frameworks offer a collection of best practices for software development and IT governance, respectively. Auditors can map and rank the information security readiness of an organization using the maturity levels shown in Figure 2.

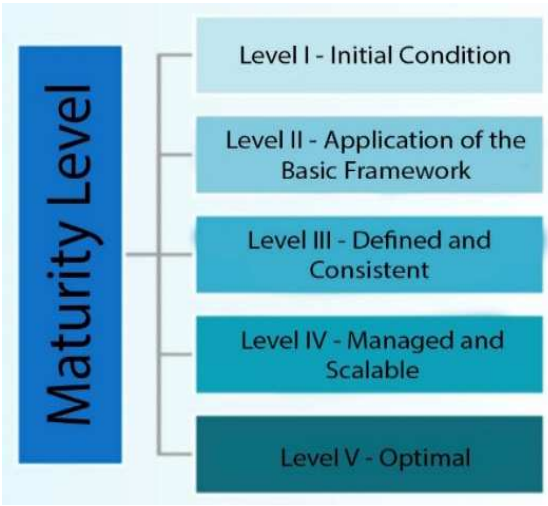

Fig. 2 Maturity Level of Information Security Index 4.1 [25]

As a result, auditors can pinpoint areas where the organization needs to improve and create the necessary safeguards to address any weaknesses. The use of maturity levels also enables auditors to evaluate a company's development over time, assisting them in deciding whether the company is making the necessary advancements to maintain the security of its information assets. Auditors can benefit from frameworks and maturity levels in creating efficient systems for auditing information security.

C. Problem Statement

In the realm of audit system development, prior research efforts [16], [19], [26], [27] have paved the way for current study. Each researcher further analyzes data, processes data, and designs applications under each organization's requirements based on the literature's findings. These existing studies have primarily focused on designing audit systems based on extensive literature reviews, tailoring them to specific organizational needs and standards such as ISO. Specifically, research by [27] meticulously analyzed pertinent literature, emphasizing the transformative impact of technology on organizational operations, particularly in the audit domain. To develop an audit system application based on an ISO (International Standard Organization) audit, a review of pertinent and focused literature was conducted [27]. By displaying the findings of the assessment review that has

been undertaken, this system was created to evaluate ISO 9001 compliance. As a result, the studies that have been done can offer crucial insights into the audit process using technology. Information technology will significantly alter an organization's environment and operational procedures [28], particularly in auditing [21].

The research stands out in several aspects. Primarily, the study introduces a cutting-edge web-based application system that utilizes an information security index, applying innovative methods in strict alignment with ISO 27001:2013 standards. Notably, evaluating system readiness integrates the ISO 25010:2011 quality of use model, adding depth to assessing information security frameworks. This unique approach distinguishes the research by incorporating current standards, ensuring a thorough and up-to-date information security analysis.

The ISO 25010:2011 standard defines a model for the quality of software products, mainly focusing on the quality in-use characteristics. It provides a framework for evaluating the quality attributes contributing to users' effectiveness, efficiency, and satisfaction when interacting with a software product. The standard identifies several quality characteristics: functionality, reliability, usability, efficiency, maintainability, and portability. The "Total Quality of Use" evaluation, based on ISO 25010:2011, assesses a software product's overall effectiveness and efficiency from the user's perspective [29]. It considers factors such as how well the system performs its intended functions, how easy it is to use, and the level of user satisfaction [30]. This evaluation goes beyond technical aspects and delves into the user experience and usability of the software.

In contrast to traditional models, such as the Waterfall Model, V-Model, Agile, and Spiral Development, which often focus on aspects such as functionality or user interface, they may lack the depth required to assess the holistic quality of a system [31], [32]. While effective in their designated domains, these conventional models might need to capture the intricacies and interdependencies inherent in modern information systems. For example, the rigid sequential nature of the Waterfall Model may overlook the dynamic and evolving nature of contemporary web-based information systems [33]. Similarly, the V-Model, emphasizing verification and validation, may excel in specific technical evaluations but could need to provide a comprehensive understanding of the user-centric dimensions crucial in today's complex information system landscape [31], [34].

Furthermore, while earlier research has laid the groundwork for understanding how technology can be integrated into audit processes, this study takes a step forward by offering a comprehensive and explanatory analysis of the Quality of Use based on ISO 25010:2011 methodologies. The expectation is that this study not only highlights the distinctive strengths of these methodologies but also illuminates potential areas for enhancing existing audit systems.

This analysis offers a nuanced perspective on the evolution of audit system development, providing invaluable insights for academic research and practical applications. This research results reveal the effectiveness and relevance of the web-based application system, thereby making a substantial contribution to the field of audit system technology.

In the subsequent sections, this research details the development process of the KAMI 4.1 Index System application, the methodology employed, and the evaluation based on the ISO 25010:2011 quality of use model. The results and discussion section comprehensively analyzes the application's effectiveness and areas for further enhancement. Finally, the conclusion summarizes vital findings, underscores the significance of the research, and outlines avenues for future exploration in audit information systems.

II. Materials and Method

Several techniques can be employed to develop efficient information security audit applications. The waterfall model is one such approach; Winston Royce first presented it. The five stages of this model, communication, planning, modeling, construction, and deployment [35], are a systematic and sequential approach to software development. Project requirements are gathered and examined during the communication stage, project goals are identified, and a project plan is developed during the planning stage. While the construction stage entails building the system, the modeling stage entails creating a detailed system design. The system is installed, tested, and deployed in its final stage. The effectiveness and simplicity of this model have led to its widespread use in the software development industry. Developers can ensure that the information security audit application is built methodically and well-planned, producing a high-quality, dependable system that satisfies the organization's needs by adhering to the waterfall model. Figure 3 depicts the various stages of the waterfall model.

Fig. 3 Waterfall Model

The research's communication phase is crucial for gathering information for the index application information security. This communication stage is conducted with interested parties. In this instance, several information systems work units spread across some educational institutions are used as data to ensure comprehensive application design. Focus groups are used for communication to comprehend the application goal. By gathering the necessary information under ISO 27001:2013, this communication stage aims to analyze the issues encountered when implementing the information security index application. The National Cyber and Crypto Agency (BSSN), the primary source of information for developing a web-based information security index application, provided the primary data for the KAMI 4.1 index. The planning stage verifies the technical task and time estimates and outlines the resources required to create a system application. The analysis and design stages are two tasks that must be finished before moving on to the modeling stage. By examining the currently used applications, the analysis stage seeks to understand system requirements [35]. The design phase produces a broad, easily comprehendible picture of the user-friendly user interface. Users can, therefore, use this system. The design uses an intuitive navigation structure with a menu that includes Respondent Identity, Electronic System Category, Governance, Risk, Framework, Asset Management,

Technology, Supplements, and the final assessment Dashboard.

The researchers construct the material research for this stage based on the data gathered during the modeling stage. A MySQL database and PHP programming were used to create this system. Researchers tested the system in real-world settings with actual users to identify any potential flaws that could be fixed. This web application was developed using the Laravel PHP framework. The final phase of this research is deployment. The system application product's results are delivered to the user at this stage. It is necessary to evaluate this implementation so that the system that has been developed can receive feedback. A summative evaluation created by Michael Scriven is used in the evaluation model in this study [35]. Summative evaluation is used to gather pertinent feedback so that the system can function and be developed under its functions after the information security of the audit system application has been completed. Utilizing ISO 25010:2011, summative evaluation is used to gauge the efficacy of software development. An international standard called ISO 25010:2011 assesses how well software is measured for quality [30]. The quality of use model, comprised of 5 characteristics, including effectiveness, efficiency, satisfaction, freedom from risk, and context coverage, is used to assess the information security of the index application system. These characteristics are shown in Figure 4.

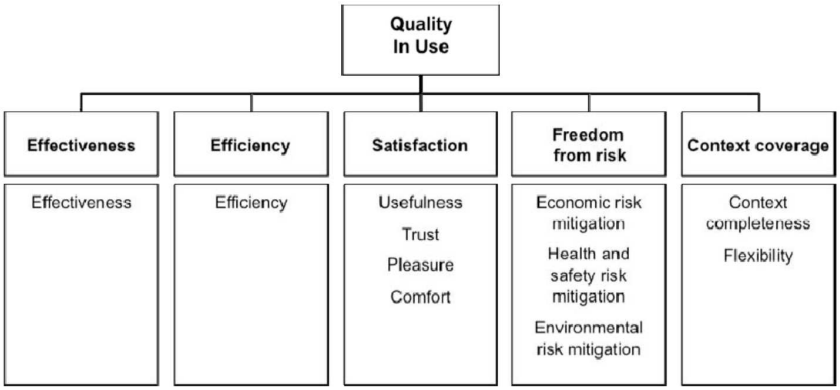

Fig. 4 Quality in Use Model [36]

To gather feedback and opinions from the users of this information security application system, an evaluation was conducted using a Likert Scale (1–5) as a questionnaire instrument. The range of the self-assessment is established during the FGD (Forum Group Discussion) with the IT unit by allocating weight to each instrument following the qualities of the quality of use model, shown in Table 1.

TABLE I
QUALITY FACTOR WEIGHTS AND METRICS

Scoring Scale	Information
0,5	Very Important
0,4	Important
0,3	Quit Important
0,2	Not Important
0,1	Very Unimportant

It is essential to utilize a reliable and established method to analyze the collected data from the questionnaire effectively. One such method is the McCall method [36], which provides a formula that can be used for quantitative analysis of questionnaire data. The formula can be applied after the instrument has been formed and weighted, allowing for a thorough and precise data analysis. Researchers can ensure that their data analysis is accurate and reliable by utilizing established methods, such as the McCall method, leading to more robust and impactful research findings.

$$Fa = \mathrm{w1c1} + \mathrm{w2c2} + \cdots + \mathrm{wncn} \quad (1)$$

Fa: total value of factor a
wi: weight for criterion i
ci: value for criterion i.

The range of quality percentages is divided into five categories [37], which can be seen in Table 2:

TABLE II
PERCENTAGE RANGE OF QUALITY FACTOR CATEGORIES

Quality Category	Information
Very good	81% - 100%
Good	61% - 80%
Fairly good	41% – 60%
Not good	21% - 40%
Very not good	<21%

Calculating the percentage value of the quality factor is the last step in the evaluation process. The following equation [36] can be used to achieve this.

$$Percentage\ (\%) = \frac{Total\ Value}{maximum\ value} \quad (2)$$

III. RESULTS AND DISCUSSION

A. Communication

The study emphasizes the communication phase. During this stage, information was gathered for the index application's information security. Focus groups involving various information systems work units across educational institutions were conducted. These groups were instrumental in comprehending the application's objectives and goals. Additionally, communication with the user of ISO 27001:2013 provided primary data for the KAMI 4.1 index, ensuring a comprehensive understanding of the application's requirements and objectives.

B. Planning

Technical tasks and time estimates were verified in the planning stage, and the necessary resources for the system application were outlined. The analysis and design tasks were crucial before the modeling stage. The design phase created a user-friendly interface, including specific categories like Respondent Identity, Electronic System Category, Governance, Risk, Framework, Asset Management, Technology, Supplements, and Dashboard. This meticulous planning ensured a structured and intuitive application design.

The KAMI Index system is currently being developed to support ongoing development in the future. Therefore, with proper planning, the application development process can be carried out effectively and efficiently during the audit process. Consumers who want to audit information security systems built on ISO 27001:2013 are the application system's end users. The expert target users were the corporate organizations and three educational institutions that will implement ISO 27001:2013. By utilizing this information system in the audit application system, these experts must evaluate the organizational readiness for ISO 27001:2013 before implementing the standard.

C. Modeling

The modeling stage involved constructing the source code based on the gathered data. Utilizing MySQL database and PHP programming, the system was developed to meet the predefined requirements. The system was rigorously tested in real-world settings with actual users, identifying potential flaws that required rectification. The Laravel PHP framework was pivotal in this modeling stage, facilitating efficient and streamlined development.

D. Construction

The researchers developed the web application system using the Laravel PHP framework during construction. This construction stage facilitated the creation of a structured and user-friendly interface, enhancing the overall user experience. The development process adhered to the predefined technical tasks and requirements outlined during the planning and communication stages. Actual users were involved in testing, ensuring the system's functionality, accuracy, and usability. Figure 5 illustrates how the login interface was implemented to create the information security of a web-based audit application system.

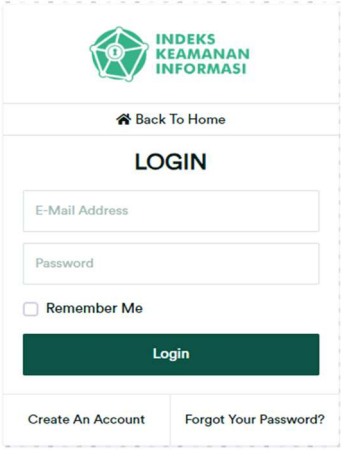

Fig. 5 Login

The IT unit, which represents the user responsible for implementing ISO 27001:2013 within the organization, and the external auditor, who conducts the information security index assessment, are the two user roles the KAMI index divides into during the login process. In managing the KAMI index, each user role serves a specific purpose. The IT department is the internal assessment party, and the external auditor is responsible for validating the assessment.

On the other hand, Figure 6 shows the page view of the dependency level value, which enables the auditor to set and view the dependency level values between aspects that include governance, risk, framework, asset management, and technology. The assessment value of the page is still dynamic between the auditee and the Kami index auditor, meaning that the index value can still change and go from low to high.

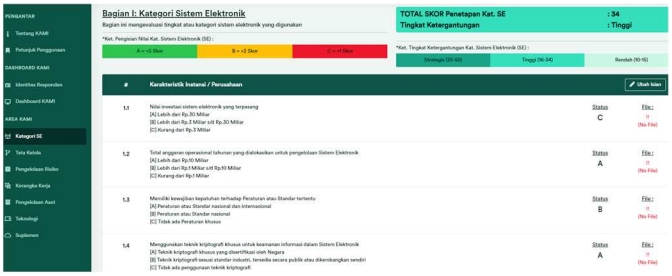

Fig. 6 Dependency Rate Values View

The evaluation results page in Figure 7 summarizes the KAMI index score. This page displays the list of applications for the KAMI index per aspect, with a score limit that must be met to achieve a high score. The evaluation results page is a valuable tool for auditors and IT units to assess the organization's information security readiness and identify improvement areas. This page helps identify specific applications that need attention and resources to increase the overall KAMI index score. The evaluation results page also provides a clear and concise summary of the information security framework's status, allowing for easier tracking of progress and setting of goals for the future. This page in the KAMI index application system provides a structured and reliable approach to assessing an organization's information security readiness.

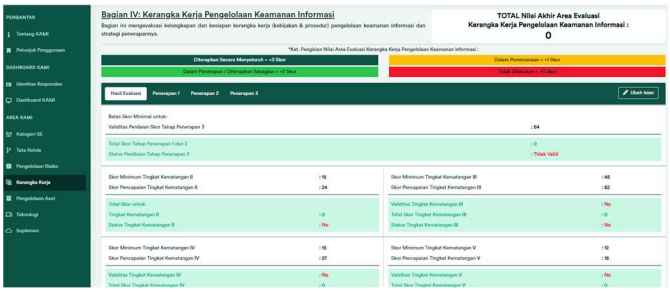

Fig. 7 Evaluation View

The KAMI index assessment system provides a final score, as seen in Figure 8, which includes information about improving the KAMI index. This score highlights the areas that need improvement based on the assessment. The assessment data is presented as an overall score, which is the sum of the scores of each aspect, namely governance, risk, framework, asset management, and technology. The final score is then presented to the organization's IT unit and the

auditor, an external party who conducted the information security index assessment test. By using this score, the auditor can identify the areas that need further attention and improvement regarding information security, and the IT unit can use it as a benchmark for future improvement efforts. Overall, the KAMI index assessment system provides a comprehensive evaluation of an organization's information security framework based on the ISO 27001:2013 standard, which can help organizations identify and address potential vulnerabilities in their information security systems.

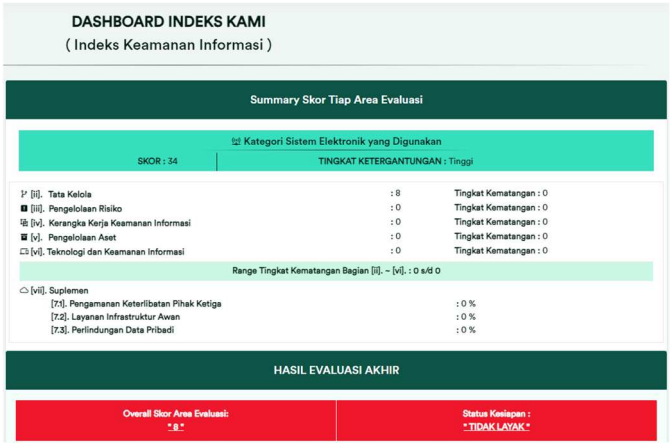

Fig. 8 KAMI Final Index Score View

This research evaluated the KAMI index through a radar chart in Figure 9. The chart represents the final value of the KAMI index assessment for each aspect and the organization's overall compliance with ISO 27001. The chart uses four colors to indicate each aspect's compliance status. The green color indicates full compliance with ISO 27001/SNI standards, while the orange indicates partial compliance. Blue represents the basic framework that needs improvement, and red shows the respondents' level of understanding and knowledge. The chart visually represents the organization's overall compliance and highlights the areas that need further improvement to achieve full compliance with ISO 27001.

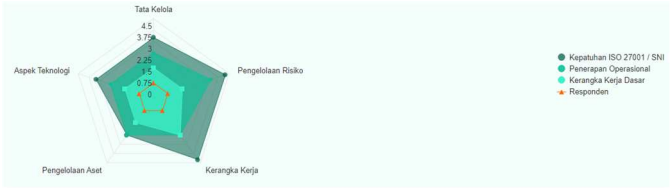

Fig. 9 KAMI Chart Index

E. Deployment

The final deployment phase involved delivering the system application to end users. The IT unit and external auditors, representing different user roles, were instrumental during the login process, marking the implementation phase's completion. This research evaluated to assess the quality of software use based on ISO 25010:2011. The evaluation data were obtained from experts in information security auditing from three educational institutions and three corporate organizations currently assessing compliance with ISO 25010:2011 using the information security index. Additionally, 30 IT experts were involved in evaluating the quality of use of the information security application system and were asked to consider the credential issues of the developed application. This evaluation aimed to obtain insights into the quality of use of the information security application system and identify any areas that require improvement. The results of this evaluation can be used to enhance the effectiveness and efficiency of the information security application system. Table 3 displays the quality of use characteristics assessed in the study, which were based on the questionnaire results.

TABLE III
EVALUATION CHARACTERISTICS QUALITY OF USE ISO 25010:2011

Characteristics	Sub	Statement
Effectiveness	Effectiveness	-The system is capable of processing data (show and save).
		-All menus and features work well.
Efficiency	Efficiency	-The interface display (system interface) contained in the system is adequate.
		-The function of each content in the application system has met the information delivery from ISO 27001.
		-The function of each menu in the application can save data
Satisfaction	Usefulness	-The system can be operated easily.
		-Menus and information displayed can be understood easily.
	Trust	-Data security in the system can be trusted.
		-Availability of menus in the form of instructions/help (Help) to assist users in using the system.
	Pleasure	-The system provides data and information according to user needs accurately and quickly (up to date).
		-The system's output (the result of data processing) is presented appropriately to facilitate user understanding.
		-The information provided by the system is easy to understand.
		-The menus on the system are easy to understand without any difficulties.
		-The font size of the application system page can be read clearly.
Freedom from risk	Economic risk mitigation	-Data on the system can only be accessed by system users.
		-The application system crash rate is low when the application encounters a system failure.
	Health and safety risk mitigation	-The system can search data for all the content contained in the system.
		-The application system is capable of tracking system usage errors.
	Environmental risk mitigation	-The program runs on frequently used operating systems.
		-New users can easily use the system.
Context coverage	Context completeness	-Users easily input the data required by the system.
		-The system can display the correct data according to the keywords.

Characteristics	Sub	Statement
	Flexibility	-The menus on the system are easy to understand without any difficulties. -Application have the potential to make changes and additions to software to improve services. -The processes or modules in the application system are well structured to not affect other processes or modules. -System developed with many functions.

The evaluation involved assessing the accuracy and completeness of the application system users use to achieve their predetermined goals. The study participants evaluated each characteristic in Table 3, including efficiency, effectiveness, satisfaction, and other relevant usability factors. The assessment was carried out to ensure that the developed application system meets the required standards and specifications for user performance and satisfaction.

Based on the assessment of the quality of use of the KAMI index shown in Table 4, it can be observed that the average values for different characteristics are as follows: effectiveness = 97%, efficiency = 96.8%, satisfaction = 76.3%, freedom from risk = 45.6%, and context coverage = 91.6%. The total score obtained by calculating the average values for each characteristic is 81.45%, which falls within the 'good' category. This score indicates that the KAMI index exhibits high effectiveness and efficiency, provides reasonable user satisfaction, and covers a wide range of contexts but still presents a notable level of risk.

TABLE IV
EVALUATION RESULT QUALITY OF USE ISO 25010:2011

Statement	Quality Factor	F*a*	%
The system is capable of processing data (show and save).	2.42	4.8	97%
All menus and features work well.	2.42		
The interface display (system interface) contained in the system is adequate.	1.824	4.8	96.8%
The function of each content in the application system has met the delivery of information from ISO 27001.	1.368		
The function of each menu in the application can save data.	1.648		
The system can be operated easily.	1.824	3.4	76.3%
Menus and information displayed can be understood easily.	1.824		
Data security in the system can be trusted.	0.576		
Availability of menus in the form of instructions/help (Help) to assist users in using the system.	0.576		
The system provides data and information according to user needs accurately and quickly (up to date).	1.872		
The system's output (the result of data processing) is presented appropriately to facilitate user understanding.	1.872		
The information provided by the system is easy to understand.	1.464		
The menus on the system are easy to understand without any difficulties.	1.952		
The font size of the application system page can be read clearly.	1.952		
Data on the system can only be accessed by system users.	1.968	2.2	45.6%
The application system crash rate is low when the application encounters a system failure.	1.476		
The system can search data for all the content contained in the system.	0.432		
The application system is capable of tracking system usage errors.	0.576		
The program runs on frequently used operating systems.	1.968		
New users can easily use the system.	0.432		
Users easily input the data required by the system.	1.476	4.5	91.6%
The system can display the correct data according to the keywords.	0.576		
The menus on the system are easy to understand without any difficulties.	1.968		
Applications have the potential to make changes and additions to software to improve services.	1.368		
The processes or modules in the application system are well structured so that they do not affect other processes or modules.	1.824		
The system developed with many functions.	1.952		

This study successfully developed the KAMI 4.1 Index application, a web-based system created through the stages of the waterfall model, namely communication, planning, modeling, construction, and deployment. The Laravel PHP framework was utilized in developing the web application system, allowing for the efficient and fast creation of web applications. The application was designed based on the KAMI index created by BSSN, which includes aspects such as electronic system category, governance, risk, framework, asset management, technology, and supplements. The existing audit calculations in the KAMI 4.1 index application were allowed in designing the application. Instead, the application was given a fresher format with a better structure to improve the user experience and ease of use.

The present study evaluated the KAMI 4.1 index system application based on web-based technology, and the results indicated a total quality of use rate of 81.45%, which is categorized as "very good" based on ISO 25010:2011. The evaluation involved assessing the effective and efficient characteristics of the application system, and the results showed good accuracy and completeness of information, menus, and features for conducting the information security index assessment. This application can facilitate independent assessments of compliance information against ISO 27001. Information completeness and accuracy are essential in implementing audit assessments to ensure compliance. The development of this application system using the waterfall model and the Laravel PHP framework offers a more structured and user-friendly interface for users to conduct compliance assessments.

The data security criterion in this study received the lowest score, averaging just 1.42, showing that users need more confidence in the system's ability to protect their data. This demonstrates the requirement for additional upgrades to raise the application level of data security (KAMI 4.1 Index). Software developers should prioritize software security during the design and implementation phases to address this issue and ensure the system's security. To ensure that their

application meets the necessary security standards and gives users a sense of security while using the system, developers can consult software security architecture standards.

The content coverage characteristic is an important aspect that needs to be considered in evaluating the KAMI 4.1 index application. Unfortunately, the evaluation results showed that some criteria in this aspect received low ratings, indicating that the system cannot display the correct data according to the searched keywords. This discrepancy between the expected data and the data stored in the database creates a barrier to the effective use of the application. Therefore, it is essential to improve the search functionality to make it easier and faster for users to find the data they need. Additionally, this aspect is related to the characteristic of freedom from risk, which also received a lower-than-average rating of 44.31%, indicating room for improvement in this area. Specifically, the system must search for data more effectively and accurately to provide users with the most relevant information. Another issue identified in the evaluation was the need for error tracking in the system. This issue is critical because knowledge-based error correction can increase the system's reliability. Finally, the evaluation results showed that new users need help to use the system comprehensively, highlighting the need for the system to provide clear and easy-to-understand instructions for new users. Improving these aspects of the KAMI 4.1 index application will enhance its usability and effectiveness.

Based on the results, several targeted measures were implemented to enhance the Quality of Use of the KAMI 4.1 index system. First and foremost, there was a concentration on refining the user interface to ensure an intuitive and user-friendly experience. This refining encompassed streamlining navigation, optimizing menu structures, and enhancing the overall visual aesthetics. Additionally, user feedback gathered through rigorous testing and evaluation phases was meticulously analyzed and incorporated to address specific usability concerns.

Moreover, strategies for performance optimization were implemented to enhance the system's focus on security, ensuring smooth interactions and quick response times. Persistent efforts were made to align the system with ISO 25010:2011 criteria, emphasizing effectiveness, efficiency, satisfaction, and other key usability factors. These enhancements collectively contribute to an improved Quality in Use for the KAMI 4.1 index system, empowering users with a robust and seamless platform for conducting information security assessments.

IV. Conclusion

The development of the KAMI 4.1 index system application, rooted in advanced web application technologies, marks a milestone in controlled audit implementation. This platform offers a fresh perspective on audit activities, providing a seamless experience for organizations aspiring to achieve ISO 27001:2013 certification. The application, crafted to facilitate independent assessments, streamlines data management, and augments the efficiency of the audit process. While commendable progress has been made, the study's evaluation, conducted through the lens of ISO 25010:2011, highlighted areas for further enhancement. Despite notable improvements in the quality of use assessment, the research acknowledges the necessity of continued development to align fully with the stringent criteria outlined in ISO 25010:2011.

Notably, challenges in data security, content coverage, and user guidance surfaced, emphasizing the need for targeted improvements. This research, although limited to the development phase of the audit system application, serves as a foundational step toward a more robust and user-friendly platform. The evaluation process drew from the author's knowledge and insights from practitioners, yet a comprehensive evaluation encompassing diverse user perspectives remains imperative.

Furthermore, the application's potential for integration with other ISO audit needs, such as quality assurance systems aligned with ISO 9001, presents a promising avenue for exploration. Understanding the intricate intersections between various ISO standards could pave the way for a unified and comprehensive approach to audit systems. In summary, the KAMI 4.1 index system application, built on web application frameworks, represents a promising leap forward in controlled audit implementation. However, this journey is still in progress. Ongoing research endeavors are essential to comprehensively understand user criteria, address existing limitations, and explore seamless integration with diverse ISO audit requirements. Embracing these challenges will usher in a new era of audit applications, ensuring compliance, user satisfaction, and organizational resilience.

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