DEVELOPMENT OF INTERNAL E-AUDIT SYSTEM FOR ZAKAT MANAGEMENT

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Abstract: *Electronic auditing, or e-Audit, is an audit task conducted with the assistance of a computer, specifically the use of electronic records to complete all or part of the auditing tasks. In line with the current digital era requirements and the Malaysian government, one of the public agencies in Kedah has taken the initiative to develop an internal audit system as one of its efforts towards integrating IR4.0 in internal work processes or decision-making. This internal audit system which is called Sistem E-audit was developed using the Rapid Application Development (RAD) method. This paper discusses the development of E-Audit system which used Django framework in the design phase, the Python programming language in the development phase, while the MongoDB database management platform was used as the database. The development of this e-audit system is expected to help the agency's internal auditors to carry out their audit tasks more comprehensively and efficiently, as well as saving time and costs.*

Keywords: E-Audit, Internal Audit, Rapid Application Development, Zakah Management, LZNK

INTRODUCTION

Electronic auditing, commonly referred to as E-audit, represents an audit methodology facilitated through computational technologies, leveraging electronic documentation to execute various auditing procedures. While the fundamental audit methodologies remain similar to traditional practices, the distinction lies in electronic execution, particularly in enabling remote audit procedures (Indiafreenotes, 2021). E-audit is a systematic, documented, and flexible process that easily retrieves electronic evidence for determining compliance with audit criteria. Furthermore, this technological advancement aligns with the preparation for the Fourth Industrial Revolution or IR4.0, characterized by various new technologies, particularly digitalization (Nawawi, 2022).

Big data analytics emerges as a pivotal component within the IR4.0 framework, affording organizations accelerated decision-making capabilities. This transformative era indirectly fosters transparency across organizational management and public service domains. Big data analytics, in particular, serves as a significant tool in fraud mitigation efforts while concurrently optimizing task efficiency through the thorough processing of data,

encompassing cleansing, transformation, and modeling, to facilitate more empirically-driven decision-making.

Aligned with the current digital era and the Malaysian government's direction, the State Zakat Board of Kedah (LZNK) is encouraged to gradually integrate IR4.0 into its internal processes and decision-making. The benefits of this technology can enhance LZNK's capabilities, fortify its internal systems, and reflect efficiency and effectiveness. Consequently, LZNK needs to adapt and utilize big data analytics technology for decision-making processes, particularly in financial decisions involving LZNK's management or financial flows between external organizations and the involved community. Therefore, this article aims to identify and analyze the attributes of audit information systems within the E-Audit system as well as develop the conceptual framework and prototype of the E-Audit system.

The subsequent sections of this paper will look into the extent of literature surrounding the disciplines between technology utilization and auditing efficacy, coupled with an overview of the E-Audit System developed for LZNK. Subsequently, the methodology of system development is presented, and the findings are discussed, and finally, the article will be concluded.

PREVIOUS STUDIES ON THE USAGE OF TECHNOLOGY IN AUDITING

Research related to the impact of technology on internal auditing has been widely conducted. The use of technology can elevate an auditor's role from a controller to an organizational consultant and further to an indirect business strategy partner (Betti and Sarens, 2020). In another study, Lloyd and Singh (2016) revealed that audit tasks can be conducted more swiftly and cost-effectively, audit targets can be broadened, and innovation can become a focal point in auditing tasks. Meanwhile, in the public sector, Rahma, Yuhertiana, and Sundari (2016) explored the utility of implementing e-auditing in improving the performance of government auditors. In terms of data collection for audit purposes, Dharmawati (2019) emphasized the role of technology in facilitating the auditors with faster data collection, faster financial statement checking because it is done with computer assistance, and develop a broader and deeper examination scope.

Several studies have explored the factors influencing the adoption of technology among auditors, including the organizational background that has undergone digitalization in its business operations (Jones, et. al., 2017). Management support, technological competence, and audit standards are also significant factors affecting technology adoption according to research conducted by Li, Dai, Gershberg, and Vasarhelyi (2018) involving 427 firms. A recent study by Azadbakht, Hemmatfa, and Seffati (2022) examined the factors influencing the impact of E-Audit on government organizations in Iran. Using structural equation modeling and SmartPLS software, the study's results showed that e-audit had a positive impact on factors related to auditing, e-audit infrastructure, e-audit, environmental factors, financial misconduct, organizational factors, positive e-audit impact, laws, and regulations. In another study, Kholis and Prayogi (2020) conducted a study to investigate the effect of perceived ease of use, usefulness perceptions and user attitudes towards the acceptance of E-Audit applications of North Sumatra. The results indicated that the perception of ease of use has an effect on and is significant to the acceptance of E-Audit applications.

Research on the impact of technology use on auditing has been extensive. For instance, a literature review conducted by Moorthy, Mohamed, Gopalan, and San (2011) using

secondary data from journal articles found that technology can assist auditors in understanding an organization's risk analysis and risk management. This process involves two-way communication between management and auditors. With technology, suggested risks can be analyzed promptly and transparently, stored in databases, and enable more effective communication between management and auditors. The use of technology can also elevate the role of an auditor from a controller to an organizational consultant and further to an indirect business strategy partner (Betti & Sarens, 2020). Lloyd and Singh (2016) stated three key benefits of using analytics data: audits can be performed faster and cheaper, the audit target can be expanded, and innovation can become the focal point of audit tasks.

Meanwhile, in the public sector, Rahma et al. (2016) explored the implementation of E-audit to enhance the performance of government auditors. It deeply examined changes in auditor behavior regarding new audit techniques based on information technology. This qualitative study employed observation and interviews with government auditors in Indonesia. The findings indicated that data availability was still not met by entities, and the time allotted for auditors to access the E-audit portal was too short. Additionally, auditors did not fully utilize the available features in the E-audit portal.

METHOD OF SYSTEM DEVELOPMENT

Rapid Application Development (RAD) is an iterative and dynamic software development methodology that emphasises speed and flexibility in the development of software applications. It includes an analysis of user requirements that are flexible enough to adjust to changing conditions, with the main objective being to guarantee customer happiness. In contrast to traditional waterfall approaches, rapid application development (RAD) prioritises the rapid delivery of working prototypes, which are then continuously improved through iterative feedback loops (Martin & Tanaamah, 2018). Numerous system development projects have made extensive use of this methodology, such as the development of geographic information systems (Sasmito & Wibowo, 2020), online sales platforms (Andriani, 2018; Kosasi & Yuliani, 2015), e-market platforms for nearby farmers (Joseph et al., 2021), and calendar applications (Qodim & Rahum, 2019).
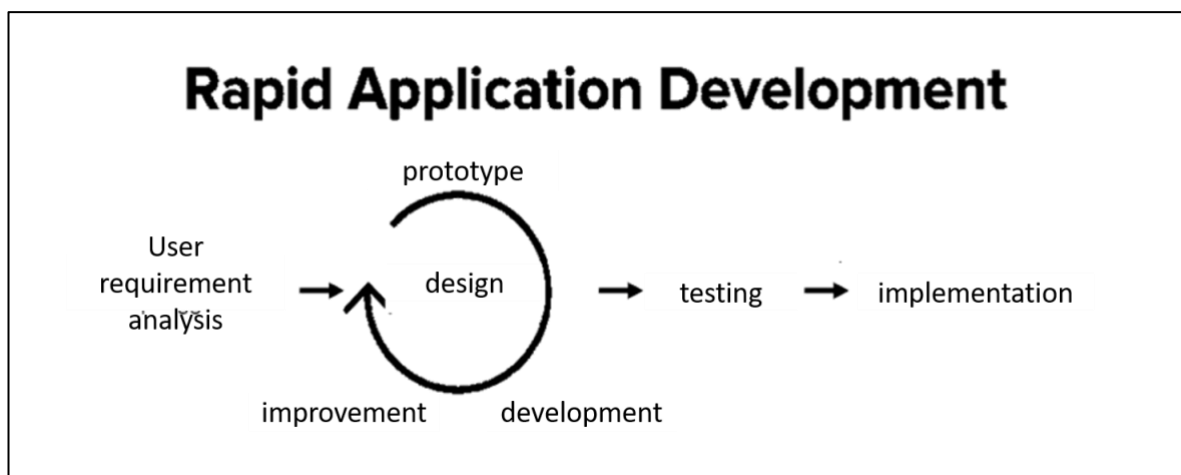

Figure 1: Rapid Application Development (RAD) Methodology

Figure 1 shows that there are four (4) main phases involved in this method, namely (i) user requirement analysis phase, (ii) design, development, and improvement phase, (iii)

testing phase, and (iv) implementation phase. The details of how this method has been embedded in this E-Audit System is presented below.

User Needs Analysis

The requirements analysis phase was conducted using the Add and Quick technique, involving interviews with four (4) staff members from the audit department, including the department head. This interview process is crucial for enhancing reliability and validity in the prototype system development process.

Additionally, the Add and Quick technique utilized forms provided by LZNK as the primary reference. These forms were subsequently translated into the main structure of the database and served as the design for information storage. The Ishikawa Fishbone Diagram was employed to assist in determining the focus of data collection, as it can demonstrate the relationship between the causes and effects of an issue, or problem, and the actions that need to be taken. In this context, data is often referred to as a highly beneficial indicator in determining the effectiveness of a process and actions.

Design, Development and Improvement

In the system design and development phase, the Django framework, based on the Python programming language, was employed. Django framework has been widely used as a development tool for contemporary RAD methodologies. This Django framework was integrated with the MongoDB database management platform (DBMS) as the underlying database. The MongoDB platform is well-suited for both the development of new systems and the enhancement of existing ones. To enable access this system via public network, the Heroku cloud application was utilized. Heroku is a Platform as a Service (PaaS) that enables system developers to construct, run, and manage applications entirely in the cloud. The architecture of the E-Audit system is shown in Figure 2 below.
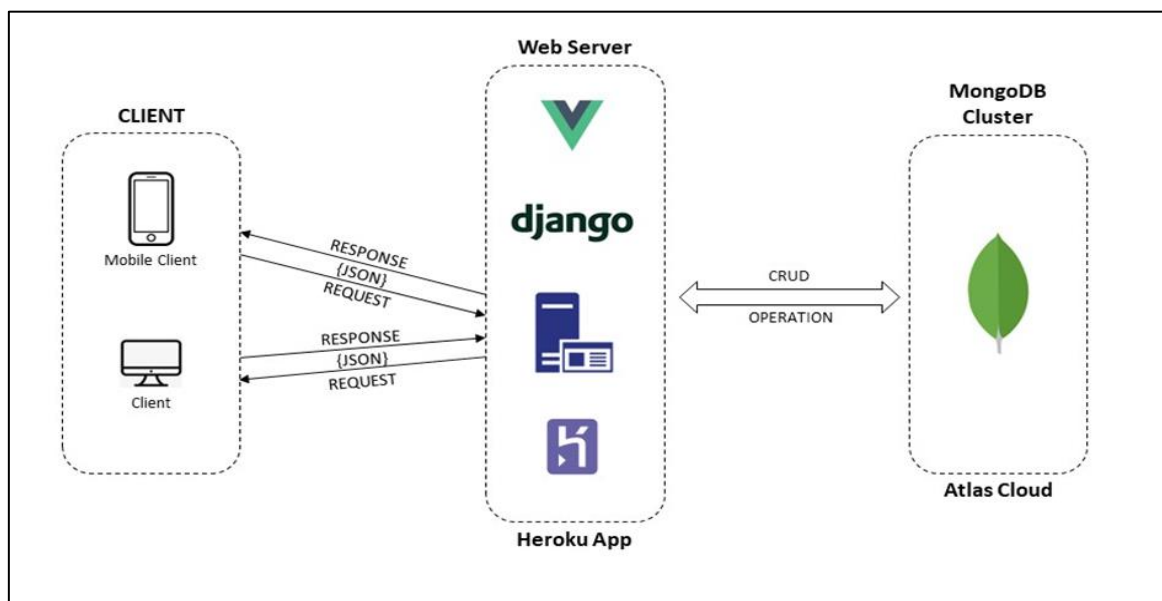

Figure 2: Architecture of the E-Audit System

Generally, the E-Audit system was designed to accommodate four distinct user roles, each tasked with specific responsibilities. Setup users will oversee data preparation activities,

Audit Process users will conduct auditing tasks, Management users will handle management-related duties, and Admin users will manage system administration tasks. All users will interact with and store data housed within the MongoDB database through the E-Audit system.

Testing

During the testing phase, five staff members were actively involved in utilizing the E-Audit system, being granted unrestricted access to all system functions over a two-week period. As part of the evaluation process, these participants were provided with a comprehensive questionnaire, conveniently administered via Google Forms. All respondents completed the questionnaire within the stipulated two-week timeframe.

Implementation

The E-Audit System has received official approval for implementation, signifying a significant milestone in its deployment. Notably, the auditors who have actively engaged with the system during the testing phase have conveyed their high level of satisfaction with its use. In fact, their positive experiences have led them to express an intent to share their experience with peers and friends in the field. Furthermore, their enthusiasm extends to recommending the E-Audit System to other organizations, underscoring its potential as a valuable tool in the realm of auditing.

Data Analysis

The interview data, which aims to understand all the attributes of the E-Audit system, was interpreted and analyzed using the constant comparative method (Erlandson, Harris, Skipper, & Allen, 1993). In this method, after the interview sessions were conducted, the researcher:
  i. Recorded all matters discussed.
 ii. Listened to each recording and transcribed them.
iii. Conducted qualitative data analysis informed by the researcher's reflection during and after the interview sessions, while listening to the recordings, and coding transcripts and interview notes.

The understanding of the domain and knowledge of audit practices informed the researcher's analysis. Before coding the data, the transcripts has been read through several times from start to finish in a single reading. Then, the data was divided into units so that each unit could be understood as a separate entity. Subsequently, meaningful codes were assigned to each unit.

According to Erlandson et al. (1993), investigation triangulation is necessary to strengthen the credibility of qualitative analysis results. In this case, the analysis results were discussed with the respondents through face-to-face presentations and discussions.

The questions included in the interview sessions covers a range of topics related to the utilization of big data analytics, current data management practices, organizational responsibilities, and the nature of data at the State Zakat Board of Kedah.

RESULTS
Functions for E-Audit System
The discussions and interview sessions conducted prior to the development of the E-Audit System revealed that auditors require a system with the following functions. First function is facilitating the auditing tasks. This system needs to facilitate the Head of Auditor in making

decisions to determine the number of audit programs to be conducted. Annual audit planning needs to be precise, considering that only four (4) auditors will be conducting all auditing tasks, including investigations across all 12 districts in Kedah. The system also assists the Head of Auditor in scheduling activities without overlap.

Next, it assists in increasing audit samples. With limited numbers of auditors (4 auditors) handling all auditing tasks, the system provides an opportunity to conduct more programs and increase the number of audit samples or, if necessary, involve comprehensive audits.

Then, the system may facilitate communication among stakeholders, particularly management, auditors and auditees. It helps auditors convey any doubts or questions from auditees promptly. It also facilitates management in gaining immediate insights into the audit process.

The system needs to be capable of storing data, including data from previous annual audit reports and current audit data. Additionally, all necessary guidelines and checklists for conducting audit tasks should be stored in the database to facilitate reference by auditors during audit work. This database is also invaluable in the event of staff turnover, as new auditors can refer to historical data to understand what needs to be done.

The system allows data in various formats (such as images, documents, and worksheets) to be stored, particularly data stored as evidence. In terms of security, only authorized users or internal auditors with appropriate user IDs and passwords can access or update existing data. These users can only access data based on the permissions granted.

Presentation of reports in data visualization format, reports will be presented in the form of charts, graphs, and tables to facilitate faster and more efficient decision-making.

Attributes of E-Audit System

In addition to the system's functions, this interview also identifies relevant attributes. These attributes are:

i. Audit Types: There are five main audit types conducted at LZNK, namely Financial Audit, Compliance Audit, Performance Audit, ICT Audit, and Special Investigation. Each type has specific control elements defined.

ii. Annual Audit Planning: The head auditor typically prepares annual audit planning before the audit year begins. For example, to conduct audits in 2023, the head auditor must prepare a draft annual planning document before the end of 2022. This document should include audits identified based on risk levels, timeframes since the last audit, CEO directives or suggestions, and received complaints. After receiving CEO support, this draft will be presented at the Audit Committee meeting before the next January.

iii. Audit Programs: The head auditors depending on the audit type will prepare Audit programs. For example, the audit program for financial audits includes financial management, budgeting, management control, procurement, asset storage, and surprise inspections. Attributes related to audit programs include:

a) Control Elements: Control elements depend on the defined audit program. Each audit program will have specific control elements. For example, revenue management is one of the control elements for financial management audit.

b) Indicators: Indicators depend on the control elements defined. For example, for the revenue management control element, one of the indicators used is the outcome.

c) Sub-Indicators: Sub-indicators depend on the indicators. For example, for the outcome indicator, one of the sub-indicators is accounts not received.

d) Checklist: The checklist is the scope of audit work related to the defined sub-indicator. For example, for the sub-indicator of accounts not received, one checklist item is to ensure that the handling of accounts not received complies with established regulations.

Other attributes related to auditing tasks also has been included namely:

i. Audit Departments

Ten audit departments and 12 district zakat offices can be selected for auditing within a single audit program.

ii. Audit Findings

There are two types of audit findings: accuracy and inaccuracy. If an audit department follows all established standards and procedures, the auditor will identify accuracy as the outcome of the auditing program for that department. Any inaccuracy will be identified otherwise.

iii. Types of Audit Evidence

Audit evidence can take various forms, including visual evidence, reports, surveys, and so forth.

iv. Risk Assessment

Risk assessment will be conducted based on a risk assessment matrix provided by the audit department or management.

v. Audit Group

Audit groups for the current year need to be registered to facilitate verification.

vi. Audit History

Audit history is crucial in assisting the chief auditor in preparing the annual audit plan for the following year and conducting risk assessments.

Figure 3 below presented the relationship of each indicator or attributes for the E-Audit system for LZNK.
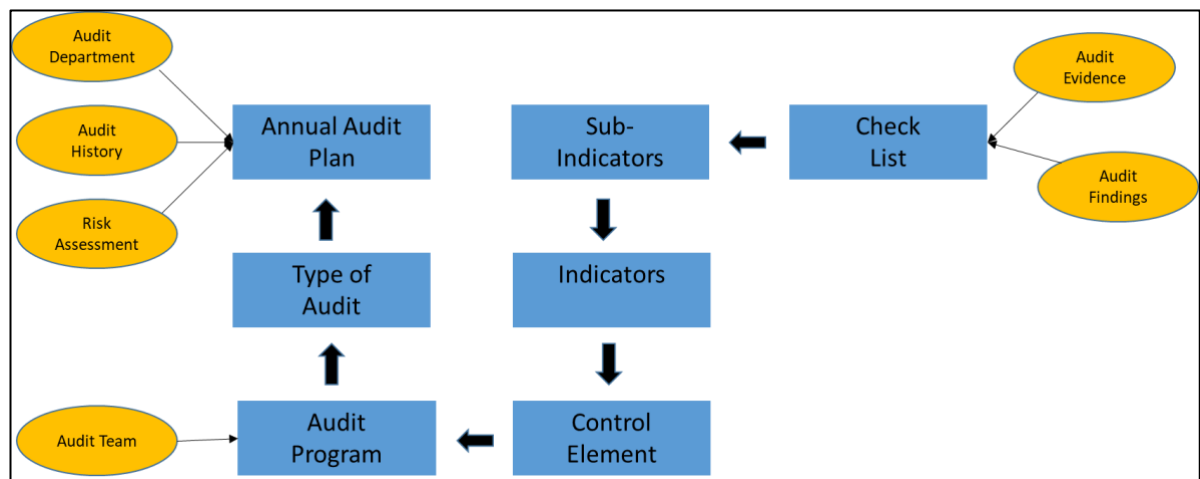

Figure 3: Relationship of Each Indicators or Attributes for the E-Audit System

Based on the attributes identified and discussed above, Figure 4 presented some of the prototypes of user interface for the E-Audit system.

Figure 4: Prototype of the User Interfaces for e-Audit System

Overall Perception of E-Audit Prototype System

Overall, respondents strongly agree that the E-Audit System provides satisfaction in its usage; they would convey this satisfaction to their colleagues, and they would recommend the E-Audit System to others, as shown in Table 1. This is based on the scale of agreement falling between 4 and 5, indicating strong agreement. The minimum scores for all three measured items range from 4.4 to 4.6, with the overall score reaching a high level (Pallant, 2011) at 4.53.

Table 1. Overall Perception of E-Audit System

Item	Min	Max	Freq	Mean
Overall, I am satisfied with the E-Audit System.	4	5	4	4.4
I will convey my satisfaction with the usage of the E-Audit System to my colleagues.	4	5	5	4.6
I will recommend this E-Audit System to my colleagues.	4	5	5	4.6
Overall Mean Score				**4.53**

DISCUSSION AND CONCLUSION

This study indicates that overall, all auditors who are primary users of the E-Audit System are satisfied with the developed prototype system. This is an important findings as the user satisfaction on the system will lead to the usage of the E-Audit System. The internal auditors agree that they are satisfied with the protoype developed for the E-Audit System due to its ease of use. This is in line with a study conducted by Kholis and Prayogi (2020) who found that the perception of ease of use has an effect on and is significant to the acceptance of E-Audit applications. Respondents noted that the E-Audit System is user-friendly because it can be easily accessed both from external and internal sources. This result is similar to Taat and Francis (2020) as their study revealed that one of the factors influencing the acceptance of the new system is usability.

It is believed that the E-Audit System enhances auditors' work efficiency, minimizes data loss, provides relevant information and additional information when needed for auditing

tasks, simplifies daily tasks, and saves time and expenses in searching for necessary information. Similarly, Lloyd and Singh (2016) revealed that audit tasks can be conducted more swiftly and cost-effectively, audit targets can be broadened, and innovation can become a focal point in auditing tasks.

The contributions of this study can be seen in terms of knowledge and decision-making, which presents findings that, can serve as a reference. The practical contributions highlighted that E-Audit system can aid in the more effective planning of LZNK's strategic plan for the current and future periods. Furthermore, the E-Audit prototype system integrating Industry 4.0 technology can enhance auditors' efficiency in completing audit tasks swiftly. It can reduce energy, time, and costs, thus indirectly enhancing the effectiveness of the auditing process. Time and energy savings for auditors can assist in improving the capacity for follow-up audits to be conducted within adequate periods and in a more systematic and organized manner. It has the potential to address current weaknesses, namely time constraints in conducting thorough and comprehensive follow-up audits. Therefore, the prototype of the E-Audit system is perceived as a relatively straightforward, necessary system that aids LZNK in enhancing management quality, particularly within the Internal Audit Department.

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