


# Development Of An Android Based Application For A Certification Management Information System For A Certification Institute: Design And Implementation

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Article Info	ABSTRACT
<b>Keywords:</b> Management information, system, android.	Society will undergo significant changes with the development of information technology. The role of management information systems at this time is very much needed by seeing the rapid advancement of technology. Of course, this needs to make people improve and keep up with the developments in the era of Industry 4.0, so as not to be left behind by technological developments, so that they can benefit from it by managing data through a mobile application-based management information system. Writing this article uses the literature review method, which includes the stages of identifying the problem, searching for relevant studies to clarify, and drawing conclusions to answer the problem. On the basis of the results of the literature review, the conclusion is that management information systems have positive effects on society by providing effective and efficient information. In order to be able to support activities, the application of information systems can be adapted and designed according to their respective needs. It can be said that facing the digital era, the application of information systems is much better.
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## INTRODUCTION

The development of science and technology aims to make it easier for people to perform their tasks and interests. According to (Kustandi and Sutjipto, 2013), the development of science and technology in the development of the world of technology in Indonesia has great potential to improve human capital (HR) by encouraging the update of the use of technology in the learning process. Science and technology have had significant progress, so it must have the support of human resources who must be able to apply it. one of them is the field of information technology. According to the data released by the Ministry of Communication and Information of the Republic of Indonesia in 2023, the number of internet users in Indonesia will reach 221,563,479.

Basically, education is process of communication and information from teachers to students, containing information about education, with elements of teachers as source of information and media as means of presenting ideas and educational materials to students

(Oetomo and Dharma 2002). In order to overcome the problems associated with the field of education, which can be done through the use of information technology in the field of education through a management information system. It can produce quality human resources by improving educational conditions with the use of information technology development.

In an effort to support management functions and activities in institutions and organizations to enterprises, management information system is a system designed to meet management needs. Implementation of this information system management, of course, to improve management functions to facilitate realization of operational functions within organizations. According to (Gaol, 2008), the system is a relationship between one unit and another unit that is connected with others so that it is inextricably lead to an entity to achieve these goals. (Rochaety, et al. 2005) state that MIS is a combination of human resources with an information technology application for the storage, selection, retrieval, and processing of data that can support the decision-making process in the field of education. From this definition, it is possible to conclude that the Management Information System is a comprehensive and integrated data management activity to process various data that will later become the information needed to manage an entity or organization and a process that is effective through the use of information and communication technologies.

This aspect of management information system services is an activity that needs to be considered and continuously developed. Its aim is to provide information system services that can make it easier for users to find out the development of activities and efforts for the organization of proper administration. Information systems that are accurate and reliable basically have requirements, namely the information obtained must have supprises value and must be able to guide users to make decisions. According to (Gaol, 2008), an information system is a system that can support the interests within the organization in transactions for management functions as a basis for decision making. It cannot be denied that information the form of management of information is one of the most important resources in an institution to increase competitiveness against its competitors. Therefore, in order to increase efficiency and effectiveness in the management process, it is time for institutions or organizations to try to implement information systems.

Mobile application systems are currently growing in Indonesia. Mobile application is an application designed that can be downloaded via a smartphone, which in the application can be used for any environment. Application comes from the word application, which can be interpreted as use and application, according to (Prabowo, et al. 2011). Mobile applications are designed to provide information that can facilitate the access directly by installing the application first, according to the application to log in so that you can learn and see the information needed through the mobile application.

Android is an operating system for mobile phones or smartphones. It provides an open platform for developers to carry out various activities that can be tailored to their needs. The emergence of Andorid is getting more and more enthusiasts so that it can be created by

applications from the system. Through android can be developed an application that has optimized android in schools is in information technology.

The current technological advances can facilitate entering information from different countries, one of which is in Indonesia, which can be seen from the Association of Internet Service Providers in Indonesia (APIA) data. According to the Association of Internet Service Providers in Indonesia (APIA), there are about 25 million Internet users in Indonesia, and the number of Internet users continues to increase by about 25% every year, which is due to the ease of accessing and obtaining information, which makes it easier to interact quickly (Tabroni, 2012). Therefore, it is necessary to implement a management information system, especially in the field of education, so that the field of education is not left behind in the rapid development of technology. In order to support the function of education information system, it is necessary to implement a management information system more quickly.

Management information systems in education can carry out their duties to provide data and information that is careful, timely and accountable. The implementation of an information system will affect many things in educational institutions, especially schools, such as the habits of activities and work culture in schools, including from the financial side. According to (Sudirman, et al. 2020), management in relation to information concerns the problem of roles as recipients and information centers for the collection of information, which is then stored and distributed with management information system tools. According to (Nugroho, 2009), the information system is part of an organizational system in which users are combined with available resources such as technology and media to control information with the intention of being able to communicate to management, which serves as the basis of information. The process of disseminating management information refers to how the process of transforming information from one work unit to another that functions as the delivery of outgoing information.

## METHODS

This article uses a qualitative method (qualitative research) by conducting a literature review or library research. Specifically, in the context of Management Information Systems Studies / Postgraduate Master of Management Program, the literature will be reviewed according to the theories discussed. In addition, the analysis will be adapted to several reputable scientific articles. The results of scientific articles from journals that are not reputable will be combined. The results of the articles used as references are then cited from Mendeley and Google Scholar. Qualitative methods are methods that focus on in-depth observations. As a result, the use of qualitative methods in research can lead to a more in-depth study of a phenomenon. Qualitative research, which pays attention to humanism or individual people and human behavior, is a response to the awareness that all consequences of human actions are influenced by the internal aspects of the individual.

Qualitative research begins with an idea expressed in a research question. Questions in this research can then be used to determine data collection methods and ways to analyze them. This method is dynamic, always open to updating, replacing, or adding data. In

qualitative research, a theoretical study must be able to be used by several methodological assumptions, namely, that the inductive methods can be used, so that they do not direct the questions posed by the investigator. posed by the investigator. One of the reasons for conducting qualitative research is when the stated research objectives require a more detailed and in-depth understanding. The data collection process is divided into several types of data collection methods. These include observation, literature review, and visual analysis. Furthermore, the data or information collected is then analyzed to obtain the results of a study to draw a conclusion.

## RESULTS AND DISCUSSION

Based on the results of the research by (Fatata and Marco, 2015), it was found that a cloud computing based SMART academic information system can facilitate monitoring and performance evaluation. In this research, a cloud system is presented for the world of education and organizations. Thus, it can facilitate schools to access anytime and anywhere through laptops, tablets, or smartphones. There are sub-sections in the implementation of the SMART system, namely the login page, data page, menu page, admin data page, student data page, teacher data page, mapel data page, test data page, warning value data page. This cloud-based SMART academic system does not require the provision of special facilities, only enough to use Internet access.

The next research conducted by (Rudianto, et al. 2013) has the results of the data findings of the information system based on SMS gateway, which can be a solution in the acquisition of information. With this sms gateway based information system, it can make it easier to obtain information presented by other parties. This system can be used in schools and institutions. According to (Zakia and Hadiyanto's, 2020) research findings, using management information system to establish cooperation with students' parents is a special strategy in using technology-enabled management information system, one of which is to provide an information room for parents to see their child's academic performance and achievement development at school. That's when the school can get the most out of the results of using the management information system.

The research findings by (Susanto, et al. 2015) have data findings, namely the SI-PINTER application is an information system to facilitate schools and PTKs to manage data to produce information to support school management needs to make decisions. This SI-PINTER application has three module categories, namely (1) PTK ledger, (2) PTK attendance, (3) classroom journal. SI-PINTER application is possible to be implemented in schools with the scope of city or district education office, but must pay attention to the readiness of human resources.

In the research results of (Widodo, 2019), the implementation of an application that can manage the regulations or SOPs against the violations that occur is presented. This system can be applied in the world of education, as well as in organizations or companies. There are sub-sections in the application, namely the order data report or SOP and also the violation of

the order. With the application of the application, related parties can easily monitor the development of information.

Next, the research conducted by (Saquro and Assegaff, 2019) has results, namely an android-based audit application with a rather attractive appearance and very easy to use. The system is developed using the android studio application, the programming language used is java, and the database used is MySQL. The advantages of this Android-based exam information system application can present the necessary information.

According to (Wijaya and Risdiansyah's, 2020) research results, implementation of management information systems, especially in education and scientific activities in schools that used information systems, could facilitate decision making in school management. The data in the information system can be used by teachers to make decisions about students' academic performance, because the function of the management information system itself is to support each level in the decision-making process by adjusting the existing situation.

According to the study of (Rahmelina, et al. 2014), when the information system is developed into a mobile learning app based on Android, it is implemented in the following stages: software implementing app, hardware implementing app, class implementing app, and interface implementing app. The mobile application produces a mobile learning system design that supports and increases the level of understanding for its users. According to the results of the research conducted by (Abu-Samaha and Shishakly, 2008), the United Arab Emirates government invests in technology and systems as an integral part of its strategies, especially in the fields of government and education, with the identification of three subsystems, namely certification control systems and infrastructure, registration, and e-learning.

With regard to the research findings of (Benwari and Dambo, 2014), the application of management information systems with the use of information communication technology connected to the web, which in the performance of daily activities including data management, to other supporting data that produce information to stakeholders and stakeholders in institutions and organizations. Thus, it can facilitate the bureaucracy to make quick and informed decisions with the results are more accurate and can be published in a timely manner.

Meanwhile, a study by (Mdlongwa, 2012) found that the benefits obtained from this management information system are able to increase motivation, participation, creativity and increase collaboration. In addition, it is able to increase the knowledge and skills of the system users. Therefore, the importance of the stakeholders must be concerned with making effective efforts to ensure that information technology can be used and implemented in all areas to increase productivity, because the support of information technology is very influential, especially in the global world.

Research results from (Breiter and Light, 2004) show that management information systems can be used as a basis for decision making based on the data obtained. Most systems are designed to collect as much relevant data as possible as information that can be used for data-driven decision making, which will be an important task for stakeholders. A

management information system can be built and then decision-relevant data can be identified and stored in a database. However, the information must support decision making through discussions with stakeholders in the school.

Furthermore, (Demir's, 2006) research shows that technological developments have an impact on organizations in both government and education. Therefore, it is necessary to study the perceptions of management information systems and also the optimal application of management information systems. This management information system can be applied in the world of education, which can change tasks by performing different tasks. With this management information system, an important achievement can be made in school management in the management information system, which has an impact on the saving of time by doing work faster so they can use their time more effectively and efficiently.

The results of (Kerski's, 2003) showed that due to the time required to develop learning modules such as geographic information systems that provide world relevance and provide information that is growing rapidly, the technological barriers to the adoption of geographic information systems such as software and hardware were less significant. Next, the findings of (Zadeh, et al. 2017) state that system interactivity has a significant effect on perceived usefulness but not on perceived ease of use. By considering system interactivity as one of the dimensions of system characteristics, they found that system characteristics have a significant effect on perceived usefulness and ease of use. In general, system characteristics are one of the important factors that can influence system usage and system user confidence.

Based on the results of (Shah's, 2014) research, the use of information technology has increased due to its efficiency and effectiveness. The use of management information systems is used to store data. The positive impact of management information systems on administration and management is due to their better accessibility, more efficient administration, higher resource utilization, reduced workload, better time management and also improved quality of reports. Barriers included lack of confidence or skills, lack of training, and lack of technical support. The system changes management roles in the areas of leadership, decision making, workload, human resource management, communication, accountability and planning. The system can help set goals, formulate strategies, and allocate resources.

From the results of the literature review above, the research results show that management information systems can have a positive impact on all aspects. It is a supporting factor in supporting services and improving quality. Today's global age, it is time to implement a management information system to create its own application, if it can be realized, it can help internal and external parties to obtain the necessary data. In this case, the need for a management information system is due to the existence of certain market segments that continuously improve the quality of services to be presented more competitive. According to (Turban, et al 2004), government services, especially education, need to adopt information technology more purposefully and quickly. It cannot be denied that the development of information technology is growing so fast that it can change the way people communicate.

The use of information systems based on mobile applications with Android OS can increase access to information and increase the effectiveness of higher quality activities (Prasojo, 2013). This is also reinforced by (Yuhefizar, et al. 2009) that information systems are specifically designed to meet the computerized needs to be able to improve the quality of services. The main issue regarding the use of management information systems is how to use them for the benefit of the community.

The development of information technology offers significant advantages. The use of mobile applications allows the necessary data to be obtained quickly and is also easily accessible anywhere at any time, making it very easy for users. According to (Utama, et al. 2019) states that advances in information technology provide enormous benefits where the implementation of computerized management information systems can increase the effectiveness of work that can manage and secure data. The application of management information systems must be based on the responsibilities of management, rules, and the behavior of organizers that have a mask that management must understand that it is all a method of activity that describes what managers must do with the operations of the institution that can be done, namely the formation of plans, organization, and being able to master controlling operations (Sutabari, 2012).

There are several examples of applications that are the use of applications from information systems that can facilitate management to manage data that produce information to support management needs in making decisions. The application has a control that is applied during the data processing process. Application control can be categorized into three sub-controls, namely processing control, input control, and output control, which are described as follows:

Application Processing Control Processing control aims to prevent errors that occur during the data processing process, which is done before the data is entered into a system. These errors often occur due to data sequence errors, data file errors in the parent, errors due to system user overload. While controlling application input, input control aims to ensure that transaction data is correct and complete, free from previous data processing errors. Input validation is a very important validation process because incorrect data input can lead to incorrect processing output results.

Then, the output of the expense control application can be controlled in the form of a report. At this stage, the aim is to be able to guarantee the accuracy and completeness of the information to be published and to organize a report media storage system, which includes setting who has the right to store, who has the right to get and receive it. The phenomenon of development can be used by school stakeholders to support efficiency and effectiveness, one of which is through the use of mobile applications. The application of mobile applications in schools must be balanced with an increase in human resources, because human resources are one of the components that can support the need to be able to run the information system application and the need for support from stakeholders.

Management Information System (MIS) is basically concerned with the process of collecting, processing, storing and transmitting relevant information to support operations

management in any organization. The power of technology has changed the role of information in an organization. Now information has been recognized as the lifeblood of an organization. Without information modern organizations will die (Andrian Syahputra et al., 2022). Some areas in management information systems (MIS) used in educational institutions include data collection, data storage for security, data processing to turn it into useful information, and data programming. In data collection, both internal and external, personnel from various work units in the organization, such as the wakasek, play a role in supporting the effectiveness of data collection. The storage department is responsible for storing data for security purposes, while the data processing department processes it into useful information using manual or machine-assisted methods. The data programming section, or programmers, are responsible for program development if the school has a computer device (Azizah, 2008).

As an effort in developing an information management system, it is possible to produce an Android-based MIS. For its development, it can use the water model. development, it can use the waterfall development model and the design tool is the Unified Modeling Language (UML). Applications can use the Codeigniter framework to produce webapps and for mobile applications can use Java as the development system (Endriyanto et al., 2021). Apart from producing MIS in the form of applications and webapps, a developer can also make it in the form of a webview using PHP as the programming language and MySQL as the database (Safitri & Basuki, 2020).

The use of ICT-based MIS, especially android, can take place better thanks to the support of school operational policies. This support involves various aspects, including planning, organizing, preparing human resources, directing, reporting, budgeting, and preparing ICT infrastructure. The importance of school operational policy support in implementing management information systems shows the need for school leadership that can understand both strategically and technically about school management and the application of information and communication technology (Oktora, 2019).

The positive impact of implementing a management information system will have an effect on improving the quality of information produced accurately, timely and relevant. This information is expected to be relied upon by various parties, including principals, vice-principals, teachers, education personnel, students and the community, as a basis for better decision-making. In addition, the use of this system also has a positive impact on the quality of information system services, which includes ease of access, reliability, responsiveness, guaranteed security, and empathy aspects. With the existence of information and communication technology-based academic information system services in schools, it is hoped that principals, teachers, and education personnel can actively participate in optimizing the use of the system, as a step to improve academic services in schools as a whole (Oktora, 2019).

The use of MIS that utilizes android in its use will make it very easy for students, teachers, principals, and the community to monitor educational progress. This is because android is the most widely used operating system. Gadgets have now become a primary need

for a person, especially the millennial generation and the next alpha generation. By developing an Android-based management information system, it is not impossible that the school managerial system will be managed more optimally.

## CONCLUSION

Studies conducted from several journals with literature studies in the implementation of mobile applications can provide convenience for all aspects. The application of an android-based management information system can have a positive impact on its application. Applications can be designed and tailored to the needs so that what is needed can support the effectiveness of activities and can facilitate relationships. because basically mobile applications can receive, process, and issue accurate information. The application of mobile applications has a fairly important role which at this time technological advances will bring changes to the world of education so that schools must follow that development. The benefits of implementing mobile applications can be felt by all parties considering that information service services are an effective thing to improve performance for far quality. In the application of this mobile application, of course, it must be followed by the readiness of qualified human resources (HR) so that they can operate optimally and utilize it easily according to their needs.

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