



Development of Electronic-Public Relations Through "Mp Mobile Apps" for Optimization of Information Systems

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Abstract: Good education management can certainly be carried out as effectively and efficiently as possible, which in the end is a positive response from users of educational services in the form of user satisfaction. There are several aspects to increase user satisfaction, one of which is information that is quickly received by the public and internal citizens of educational institutions. The method in this study uses the Waterfall Model from Winston Walker Royce, which has 5 stages (Analysis, Design, Implementation, Testing, and Maintenance). The purpose of this research is to emphasize the improvement of information services for department members and the general public, namely the quality of information services in a practical and integrated manner. The results of the "MP Mobile Apps" development show that the "MP Mobile Apps" application has met the eligibility standards to be implemented with an average of each. The category is as much as 85%.

Keywords: Education; Information service; Mobile app

Introduction

The development of technology every time is increasingly showing tremendous improvement, and the presence of technology certainly aims to help human work. The era of the Industrial Revolution 4.0 brought new introductions to technology increasingly massive, this includes big data, artificial intelligence, virtual reality, and other technologies. The development of new technologies is carried out to improve productivity, quality of education, and quality of life, and to promote healthy living for all people (Burbules et al., 2020). Technological developments also have an impact on the field of education, namely the adoption of technological innovations in the management of education and learning. Web 2.0 interactivity should increase students' understanding and interest in online information; social networks can develop writing and collaboration skills; mobile devices allow learning anytime, anywhere;

augmented reality improves students' learning attitudes and learning efficiency; and digital games increase engagement and therefore improve academic achievement (Haleem et al., 2022). However, conditions in the field are not all educational institutions use technology massively and thoroughly in every aspect of education management.

Good education management can certainly be carried out as effectively and efficiently as possible, which in turn is a positive response from users of educational services in the form of user satisfaction. User satisfaction is not manifested in real terms therefore user satisfaction does not have an objective definition (Naini et al., 2022). Several factors affect customer satisfaction that can be used as a reference by an organization, including trust in the brand, quality of service, and promotion mix. In some cases, user satisfaction can be the only factor that determines whether the performance

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of the information system is acceptable to the organization.

There are several aspects to increase user satisfaction, one of which is information that is quickly received by the public and internal citizens of educational institutions. In this era of technology and information, it is very necessary to accelerate the delivery of information because of the demands of the times and the way employees work that already can multitask. In terms of learning, the delivery of the right information is very important for educators to do, especially in building effective communication because it will greatly determine the success or failure of learning by always considering the characteristics of student development (Wahyuni, 2018). Meanwhile, in terms of implementing information applications in institutions, the delivery of information to students can be directly known through their mobile phones so that they do not miss important information. Therefore, the need for prompt information must be accommodated by every educational institution, which becomes a necessity to carry out the principle of accountability and information.

Information has become an important need for us to meet in everyday life. To provide satisfaction with this need for information, many Institutions do different ways (Haverila et al., 2021). One of the things that institutions do in overcoming these challenges is by developing information technology. Information technology has become a factor that indicates its presence in almost every factor in human life today and is gradually increasing its influence on each field. One of the undoubted areas is the field of Education. The importance of information technology is becoming increasingly visible, and the use of information technology in the world of education is also increasing (Fadhilah et al., 2021), one of which is to meet information needs in various ways, such as developing information services through the use of media, both social media and conventional (print) media. On the other hand, there are also educational institutions that already have special units to provide information services to internal institutions and the public in general by utilizing media and technology that has developed to this day. So that the presence of information services in each institution can provide accommodation for the public to get to know more about the programs and advantages that each educational institution has.

The presence of information services in every educational institution is certainly also part of the image of the institution in the eyes of the community. This is one of the effective ways to promote educational institutions through the delivery of information to the public. Because a good image is obtained from the satisfaction of service users (the public) for the services provided by the Institution. Satisfaction is a feeling that

is obtained after comparing what is perceived with what is expected (Prasilowati et al., 2021). So, to get customer satisfaction, institutions must be able to meet customer expectations. Based on the results of the Student Satisfaction Index conducted by the Department of Education Management in the 2nd Semester of 2019/2020 to the 1st Semester of 2020/2021 has decreased, in detail obtaining the following results:

Table 1. Student Satisfaction Index of MP Department

| Aspects | 2 nd Semester 2019/2020 | 1 st Semester 2020/2021 |
|--|---------------------------------------|---------------------------------------|
| Reliability of Lecturers and Academic Staff | 3.3 | 3.0 |
| Responsiveness | 3.2 | 2.9 |
| Assurance (Treatment of Students) | 3.2 | 2.9 |
| Empathy (Understanding of Lecturers and Academic Staff to student interests) | 3.3 | 3.0 |
| Tangibles (Educational Facilities) | 2.9 | 2.8 |
| Student Satisfaction Index Value | 83.63 | 75.85 |
| Predicate | Excellent | Good |

The results of the Student Satisfaction Index Value can be seen that there is a decrease in student satisfaction in all aspects, this happened during the Covid-19 pandemic. The lowest score is in the *aspect of Tangibles* (Educational Facilities), namely the improvement of educational facilities services every year. One of the educational facilities that are not yet owned by the Department of Education Management but are the expectation of students according to the results of the Student Satisfaction Index Value is a management information system that is only limited to the website. Website information services continue to run amid a pandemic and the policy of limiting access to campus, of course, this is enough to provide information to residents of the department and the general public. However, flexibility and accessibility for citizens and the community need to be optimized (Davidescu et al., 2020). This further proves that there are obstacles in terms of accessibility and flexibility of major information that are not optimal.

The purpose of this study specifically emphasizes the improvement of information services for citizens of the department and the general public (Kruk et al., 2018), namely the quality of information services in a practical and integrated manner. Meanwhile, the importance of this research to be carried out immediately due to the many needs and demands of consumers (citizens of the department and the public) for the quality of information services in the Department of Education Management at the State University of Surabaya, especially access to information in a practical and integrated manner. Therefore, the researcher decided to conduct a study with the title "Development of Electronic-Public Relations through "MP Mobile Apps"

for Optimization of Information Systems in the Department of Education Management", which aims to develop Mobile Applications to optimize information systems in the S1 Department of Education Management.

Method

This research uses the development method. The process used is the System Development Lifecycle (SDLC) which can make the application development process simpler and more flexible, one of the additional models aligned is the Waterfall Model. The development methodology framework uses the Waterfall Model from Winston Walker Royce, namely, there are 5 stages (Analysis, Design, Implementation, Testing, and Maintenance), as follows:

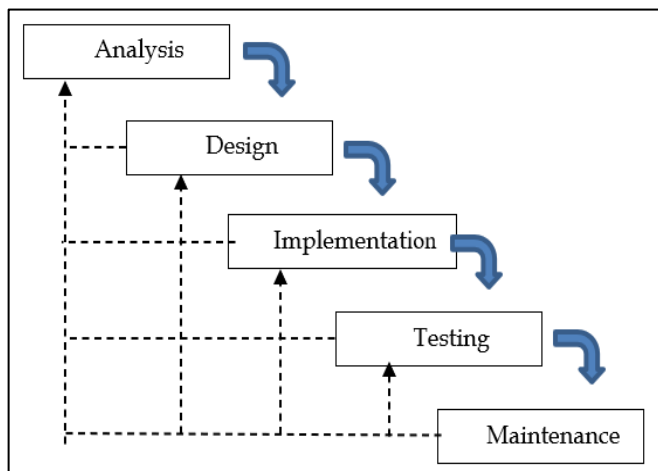


Figure 1. Waterfall model Winston Walker Royce (Morgan, 2018)

Result and Discussion

The need for information is becoming increasingly important for humans, especially where the times are advancing as they are today. Humans increasingly need fast and trusted information services to meet their needs for such information. Various efforts are made to develop information services that can meet human needs, one of which is by integrating technology or often referred to as technical information. Information technology can also be defined as the use of technology in the management and process of information, which integrates technology in all processing and transmission of information.

The importance of developing information services that can meet the needs of its users is also realized by S1 Department of Education Management, Faculty of Education, State University of Surabaya, therefore researchers conducting research and development of "MP Mobile Apps" which aim to optimize the information system in Department of

Education Management Faculty of the Education State University of Surabaya using the Waterfall Model development method by Winston Walker Royce. The results of the Waterfall Model stages used in the study, in detail can be known as follows:

Analysis

There are two requirements, namely functional and non-functional in optimizing the management information system of the Department of Education Management (Abubakar et al., 2019). Functional requirements are use cases that describe a user's interaction with software, including requirements such as purpose, scope, perspective, function, software attributes, user characteristics, function specifications, interface requirements, and database requirements. In contrast, nonfunctional requirements refer to various criteria, limitations, limitations, and requirements imposed on the design and operation of the software rather than on specific behaviors. This includes properties such as reliability, scalability, test capability, availability, sustainability, performance, and quality standards.

Design

In optimizing the management information system of the Education Management Department, namely the planning and problem-solving process in the form of solutions in the form of software (Arroyan & Subekti, 2021). It has implications for software developers and designers to define plans for solutions that include algorithm design, software architecture design, database conceptual schematics and logical diagram designs, concept design, graphical user interface design, and data structure definition. In this study, we will use the Android Studio developer application IDE (Integrated Development Environment) created by Google in 2013. Here's an overview of the "MP Mobile Apps" application:

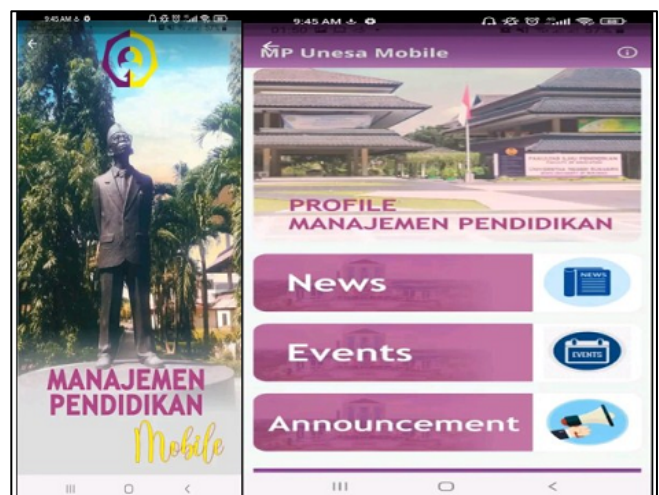


Figure 2. Home and menu display of MP Mobile Apps

Implementation

This stage refers to the realization of business requirements and design specifications into programs, databases, websites, or software components that can be concretely executed through programming and deployment. This phase is where real code is written and compiled into operational applications, and where database and text files are created. In other words, it is the process of turning the entire requirement and blueprint into a production environment. So that in optimizing the management information system of the Education Management Department, adjustments will be made according to the conditions of comprehensive information development (Choo et al., 2019).

Testing

This stage is also known as verification and validation which is the process of checking that the software solution meets the original requirements and specifications and that it achieves its intended purpose. Verification is the process of evaluating software to determine whether the product of a given development phase meets the conditions imposed at the beginning of that phase; while validation is the process of evaluating software during or at the end of the development process to determine whether it meets the specified requirements. In addition, the testing phase is an outlet for *debugging* where system *bugs* and glitches are found, fixed, and refined accordingly. So at this trial stage, there are 2 (two) activities, namely the validation of the "MP Mobile Apps" application to *experts* and micro-scale trials on several users (students, lecturers, and education staff) in the Department of Education Management Faculty of the Education State University of Surabaya. The assessment instruments used in this phase of the trial are as follows:

Table 2. Test Questionnaire Instrument

| Category | Total Question |
|----------------------|----------------|
| Functional | 5 items |
| Design | 5 items |
| Ease to access | 5 items |
| Suitability of needs | 5 items |
| Total | 20 Items |

The results of the microcell trial on several users in the Department of Education Management State University of Surabaya are as Figure 3.

Meanwhile, the test results by the expert show that judging from all the categories tested, namely, function, design, ease of use, and suitability of needs, they have met the standard for mobile applications that are ready to be used, there are only a few small things that must be optimized, for example, such as the link that connects the menus is still not optimal, besides that the amount of data used by the application is still too large, if possible, it needs to be lowered again. So, it can

be said that the revisions made before the application was implemented were more of a technical problem. And before "MP Mobile Apps" was implemented it was confirmed that these minor flaws had been fixed.

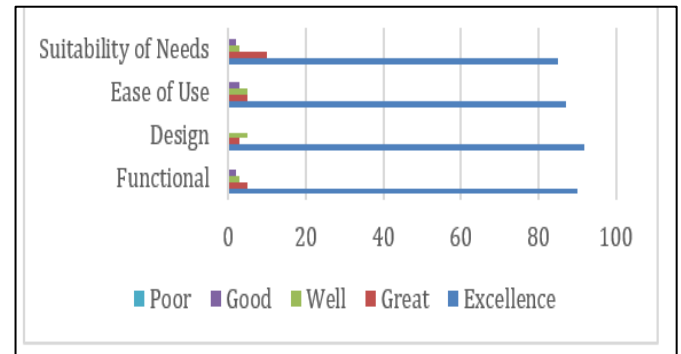


Figure 3. Micro user test result

Maintenance

This final stage will be the process of modifying the software solution after delivery and deployment to correct the output, correct errors, and improve performance and quality. Additional maintenance activities can be carried out in this phase including adapting the software to its environment, accommodating the requirements of new users, and improving the reliability of the software. It can also be said, that the results of the previous 4 stages will be accommodated in this stage to provide input that can later improve the features of the "MP Mobile Apps" application according to the needs and environmental conditions in the Department of the Education Management State University of Surabaya.

The need for information becomes an important thing for humans, especially in this digitalization era (Kurniawan, 2022). Where digital technology has affected almost every aspect of human activity. Digital technology has enabled the dissemination of all types of information (Quach et al., 2022), replacing traditional formats with automated systems. The distribution of information becomes faster as the era goes on, and people also need information services that can provide them with the information that they need faster. That's why many organizations carry out the development of information services so they can meet the need of the user. This is also done by educational institutions.

Education become one of the biggest sectors affected by technology in almost all of its sectors, especially information services. Information services serve as a bridge between information users and information sources. That's why the organization needs to consider it as seriously as possible. Because user satisfaction is obtained from good service. It also means that when the quality of service is good then the user will also satisfy with the service, and otherwise. Nevertheless, many educational institutions still don't

know how to use technology to improve their information service (Tulinayo et al., 2018).

This becomes a major challenge for an educational institution that needs to be solved. To assess the quality of information service, as mentioned before, namely through user satisfaction (Guo et al., 2023). If the number of user satisfaction is low, it means that the quality of the information service is also low, and likewise. Therefore, it is important to improve the quality of the information service sustainably, because a high number of user satisfaction can create a good image for the educational institution. User satisfaction is a measure of the success of programs carried out by an organization (Machmud, 2018).

User satisfaction is also the goal of the success of telecommunication service providers in improving their services, it can even be used as a measuring tool to increase the success of the national economy as well (Abdullah et al., 2022). Organizations are proven to prioritize their users by providing them with their needs as well as the assistants they need. So that their users will feel confident to use their services and become long-term users who are satisfied with the services provided by the organization. User satisfaction is very important for an organization to be able to continue to develop its business (Rita et al., 2019), both product and service providers.

Users will be satisfied if they are given the best service by the organization, which will then lead to a strong perception of the services provided by the organization which will lead to the emergence of high trust in the organization concerned (Wilkins, 2018). Therefore, it is very important to provide satisfaction to users by providing the best service, so that the organization can continue to grow. One of the efforts that can be made to develop information services that can meet user needs and satisfaction is by integrating technology. The most popular information and communication technology innovation today is mobile applications. So far, experts have agreed that marketing using mobile applications can solve the problem of user satisfaction and adoption (De Canio et al., 2021).

Some of the advantages of mobile applications quoting are as follows:

- Can use the Apps anywhere, anytime, and as many times as you need.
- Mobile Apps are free.
- Mobile apps are easy and quick to download and update.
- Mobile apps can be deleted if you do not find any of them beneficial.
- You can get the App, its icon, a description, user ratings, and comments about it.
- You can get numerous Apps for a specific skill or a grammatical structure that they need to develop or practice.

- Mobile apps targeting a specific skill have different material coverage, and content difficulty levels and use different approaches to skill development.
- Mobile apps save instructors time and effort as they are readily available.
- Instructors do not have to prepare any Apps or supplementary material.

That's why many organizations had developed mobile apps to increase their user satisfaction (Alalwan, 2020). Digital 2021: Global Overview Report has also shown that mobile users worldwide in 2021 have to reach 5.22 billion people, 66.6% of the total human population. In Indonesia alone, internet users reach 202.6 million, or 73.7% of the total Indonesian population. In addition, 96% of internet users in Indonesia use mobile phones. Therefore, Indonesia is one of the fastest-growing mobile application markets globally.

Based on the results of micro trials on users conducted at the Department of Educational Management, Faculty of Education, State University of Surabaya, it can be seen that "MP Mobile Apps" have met the eligibility standards, namely with an average of 85% in each category, which has been into the category of excellence. In the function category, 90% of the results were obtained, which means that "MP Mobile Apps" has functioned very well according to its function, namely providing information related to the Department of Educational Management, Faculty of Education, State University of Surabaya. Then in the design category, the result is 92%, which means that "MP Mobile Apps" has a very good design so that it can attract the interest of many users.

Furthermore, in the ease-of-use category, "MP Mobile Apps" received trial results of 87%, which means that "MP Mobile Apps" can be operated easily by users, even though it does not reach the 90% feasibility level. This is relevant to the test results from experts who also provide several notes related to matters relating to the ease of use of the application. Last but not least, the suitability of the needs category also received no less good results, namely as much as 85%, which can also be interpreted that "MP Mobile Apps" are by user needs, and can meet the information needs of users. Overall, it can be concluded that the development of "MP Mobile Apps" at the Department of Educational Management, Faculty of Education, State University of Surabaya has been going well and has resulted in a decent mobile application to be implemented.

These results can also be interpreted that the development of mobile applications does provide convenience in providing information services for an organization. Some of the relevant research results related to mobile applications and their positive impact on education are as follows. Research conducted by Hsu et al, with the title "*Female Preschool Teachers' Perceptions*

of *Mobile Communities and Teacher Self-efficacy for Professional Development: The Mediating Effects of Trust and Interaction via Mobile Apps*", shows that interactions carried out through mobile applications demonstrated a mediating effect on the relationship between cellular communication and teacher self-efficacy (Chao, 2019).

Research conducted by Seah entitled "*The efficacy of using mobile applications in changing adolescent girls' physical activity behavior during weekends*", shows relevant results, namely qualitative results revealing the benefits of using mobile applications to promote physical activity, such as the right to autonomy in choosing Physical Activity, ability to view friends' Physical Activity posts, and monitoring of Physical Activity yourself (Zuo et al., 2021). Furthermore, the research conducted by Ha, et al entitled "*The impact of a gamified mobile question-asking app on museum visitor group interactions: an ICAP framing*", shows the results that the Mobile Question-Asking App developed has proven to be able to encourage group members to share information, Mobile Question-Asking App can also increase collaborative group interaction and informal learning. Research conducted by Tan even proves that the development of mobile applications is not only beneficial for ordinary users but also for users with disabilities, the results of his research show that mobile applications help students with disabilities in doing distance learning (Polat et al., 2019). The results of research conducted by Marini et al. also show that using the metaverse application has a positive impact on student learning outcomes.

Conclusion

Technological developments have had a significant impact on almost all aspects of human life, especially information, and communication. The development of information and communication system services continues to be carried out to meet user needs and increase user satisfaction. The results of the development of "MP Mobile Apps" which aims to optimize information system services at the Department of Educational Management, Faculty of Education, State University of Surabaya, show that the "MP Mobile Apps" application has met the eligibility standards to be implemented with an average of each. The category is as much as 85%. Although this development has reached the very good category, it must continue to be monitored in its management. For further research and development, it may be better if the percentage of the suitability of needs can be increased.

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Conceptualization: Mohammad Syahidul Haq, Aditya Chandra Setiawan, Data curation: Ima Widyanah, Najlatun Naqiyah, Firman Ashadi, Funding acquisition: Firman Ashadi, Methodology: Aditya Chandra Setiawan, Ima Widyanah, Visualization: Mohammad Syahidul Haq, Aditya Chandra Setiawan, Ima Widyanah, Najlatun Naqiyah. Writing-original draft: Ima Widyanah, Najlatun Naqiyah, Firman Ashadi, Writing-review & editing: Mohammad Syahidul Haq, Najlatun Naqiyah, Firman Ashadi.

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Conflicts of Interest

No Conflicts of interest.

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