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Use of Ticketing System in Freelancing Platform to Maintaining Client Trust in Product Development Process

Andri Sahata Sitanggang[1*], Novrini Hasti[2], R Fenny Syafariani[3], Lusi Melian[4], Bondan Rachmat Santoso[5], and Muhammad Daffa Shidiq[6]

[1,2,3,4,5,6]Faculty of Computer Science and Engineering, Universitas Komputer Indonesia
[1,2,3,4,5,6]Jl. Dipati Ukur No.112-116, Lebakgede, Coblong District, Bandung City, West Java, 40132, Indonesia

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***Correspondence Address:**
andri.sahata@email.unikom.ac.id

ABSTRACT

Micro, small, and medium enterprises (MSMEs) are considered to be one of the important components in the economic development of a country, especially Indonesia. However, it has been found that MSMEs are lagging in digitalization, the adoption of information technology, and digital marketing. An information system where MSMEs can have easy access to IT and digital marketing professionals can be a solution to boost and encourage digitalization among local MSMEs. Developing such an information system requires the project to be able to quickly adapt and change based on the user's needs and current trends. This study proposes an incremental solution to building an accessible information system catered for MSMEs by incorporating the ADDIE model into the development cycle. To understand the feasibility of the system, several group meetings are arranged to demonstrate and try out the system's capability to the target users. The results indicate that the system is generally able to fit the needs of MSMEs and is quite effective at connecting the MSESs to IT and Digital marketing resources and experts.

Keywords: *Web; MSMEs; Enterprises; Digital, M9999.arketing;*

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1. INTRODUCTION

The development of the digital era that never slows down means the development and rapid technological changes. The high rates of change (technology) then demand changes in business procedures, especially in developing countries. Some businesses are unsure as to whether they should update or completely change their business strategy. On the other hand, technological developments gave birth to potential new fields of work and facilitated interaction between humans through innovations (in information technology).[1]

Micro, small, and medium enterprises (MSMEs) are considered an important component in a country's economic development. MSMEs can create jobs and boost the economy, especially for middle- and lower-economic groups. Data from the Indonesian Central Statistics Agency (Badan Pusat Statistik, BPS) stated that in 2018, Indonesia had 64.2 million registered MSMEs, with a composition of 63.35 million micro business units, 783 thousand small business units, and 60,702 intermediate business units. In some regions, it was even found that MSMEs can absorb up to 116 million workers [2], [3]. In the context of Indonesia's national economy, as of 2018 MSMEs themselves have a significant contribution to Indonesia's national Gross Domestic Product (GDP), amounting to Rp8,573 trillion (61.07% of the business world's GDP contribution); non-oil and gas exports amounted to Rp293 trillion (14.37% of total non-oil and gas exports); and MSMEs also contributed Rp2,564 billion (60.42%) in the investment sector [3].

The arrival of the COVID-19 pandemic seems to have implications for economic, social, and political life worldwide, including the Republic of Indonesia. The economy is one of the sectors affected by the arrival of the COVID-19 pandemic in Indonesia. MSMEs are of particular concern, considering the large contribution of MSMEs to Indonesia's national income [4]. Based on a survey conducted on 6,000 MSMEs in the April-May 2020 period by the Indonesian Business Development Service Association (ABDSI) showed that around 36.7% of MSMEs did not experience sales, while 26.6% experienced a decrease in sales volume of more than 60% during the pandemic [5].

The pandemic, which had limited physical interaction between humans, then increased the awareness of business actors and policymakers on the importance of adapting MSMEs to technology in the production process and digital information technology media for promotional and marketing activities [3]. It was recorded that only about 8% of MSMEs were integrated with the digital ecosystem in 2018 [3], before the arrival of the COVID-19 pandemic. This figure is seen to have increased in 2020, where around 16% of MSMEs are integrated with the digital ecosystem, and as many as 42% of MSMEs are reported to have used social media [6].

1.1. MSME Digitalization

The digitalization of MSMEs in Indonesia is projected to grow, with estimates that Indonesia's digital economy will be the largest in Southeast Asia by 2025. However, the process of digitizing MSMEs does not escape the following three obstacles: 1) MSMEs are still constrained by the production of goods and meeting market demand; 2) The quality of MSME players' resilience in the digital market is still uneven, partly due to the influence and competitive pressure of larger-scale companies that are also using and transitioning to the platform digital; 3) MSMEs still need digital literacy information and improving the quality of human resources to maximize digital business potential [6].

According to Facebook data research, 74% of Indonesians are connected to the internet through smartphones. As reported by one of the marketing agencies based in the United States, We Are Social, as of January 2021, Indonesian internet users are said to spend the majority of their time online on these five social media sites, namely YouTube (93.8%), WhatsApp (87.7%), Instagram (86.6%), Facebook (85.5%), and Twitter (63.6%) [5]. The ability of business entities, especially MSMEs, to adapt and 'play' on social media is considered important for the sustainability and ability to compete in the pandemic and post-pandemic digital era.

Sri Widowati, Country Head of Facebook Indonesia, has also said that in 2017, as many as 45% of Indonesian internet users preferred to shop online. This trend is expected to continue to increase every year, indicating a transition to a digital lifestyle for Indonesian people. As of January 2019, as many as 93% of

internet users in Indonesia look up goods/services products online, 90% of users visit online stores through several devices, 86% make online transactions from several devices, 76% of users make online transactions via smartphones, and 37% of users make transactions online through personal computer; data that shows the magnitude of the potential for online shopping transactions to develop significantly, but cannot be optimally exploited by digital marketing by MSME [5].

MSME adaptation to the digital era is crucial to maintaining the sustainability of MSMEs and restoring the Indonesian economy post the COVID-19 pandemic era. Adaptation of MSMEs with the transition to the digital era can be applied in various ways. The adoption of sales or marketing through social media is proven to have a positive influence on a person's desire to buy a product, especially retail products [7].

The process of MSME digitalization has not taken place optimally. Many studies have found that the lack of use of digital media helps the sustainability of MSME businesses [5], [6], [8]. Most digital media adaptations in MSMEs are constrained by the lack of knowledge about properly using digital media and limited access from MSMEs to information technology and digital marketing experts. A policy or system can be built to facilitate the development of MSMEs in adopting information technology and using digital media such as e-commerce and social media.

1.2. The Use of IT and Enterprise Performance

Studies conducted in developing countries in Latin America found a positive relationship between the use of digital technology on net sales and company productivity [9]. This trend also applies to studies conducted to look at the impact of changes in information technology on economic development in developing countries in the developing Middle East and Sub-Saharan Africa, where the adoption of the internet and mobile phones (mobile phones) has a significant positive influence on economic development [10].

The study [9], [10] is also in line with [11] where the implementation of technology has a significant favorable influence on the performance of MSMEs with indicators such as perceived benefit, compatibility, and cost as a reference for measuring the application of technology. These indicators have different T-statistics. The cost indicator, which is a measurement of the costs incurred to implement technology in MSMEs to improve performance, has the highest T-value, indicating that although the costs incurred to implement technology are relatively small, there is still an increase in performance through increased profits and increased consumer satisfaction.

Based on the statements of the studies above, it can be concluded that the application of technology to companies, especially MSMEs, has a significant positive influence on company performance. Research conducted in 2019 in Jakarta on information technology readiness and adoption factors in MSMEs showed that readiness factors such as Optimism—which indicates a level of confidence that technology adoption can be realized—and Innovation—which indicates confidence that technology adoption is part of a more extensive system—have a positive effect on information technology adoption rates. On the other hand, the discomfort factor, the perception that the adoption of information technology is uncomfortable, is the most influential factor hindering the process of information technology adoption [12].

To increase the adoption of information technology among businesses, especially MSMEs, one of the frameworks that can be used to increase the adoption rate of information technology utilization is the Technology-Organizational-Environment (TOE) framework. The Technology factor is a factor of which the increase in the development and accessibility of information technology will ultimately lead to an increase in the adoption and utilization of information technology; the Organization factors are factors influenced by mastery of technology from within the internal of organizations, generally from human resources at the high management level, which can affect the level of adoption of information technology utilization; While the Environment is the external factors such as competitive pressure, market pressure, and pressure or intervention from government agencies/institutions. These three approaches each have different influences. Technology factors and organizational factors have a positive and significant influence on the adoption of information technology among MSMEs, while environmental factors have an

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insignificant influence. However, if these three factors are combined simultaneously, as in the TOE framework, there is a significant influence on the adoption of information technology in MSMEs [13].

Based on the issues and hurdles encountered by the MSMEs when it comes to adopting and implementing IT and digital marketing practices, this study is conducted to help MSME by developing a web-based information system to connect MSMEs with IT and digital marketing resources and professionals. This web-based platform will serve at-least 3 major functions: 1) identifies IT and digital marketing needs of the MSMEs, 2) as a IT and digital project management platform for MSMEs, and 3) provide job listings for IT and digital marketing professionals. This web-based platform will be developed with a client-server architecture, a Laravel-based PHP server application coupled with MySQL database, and a ReactJS-based web client meant to run on most modern web browsers. This information system implementation aims to run on modern web browsers, accessible from most modern personal computers, tablets, or mobile devices. The information system is named "Dongkrak Cuan", more casually known as DOCU, and will be addressed as such in this document.

2. METHODS

The research and development of DOCU uses a cyclical model known as the ADDIE model. ADDIE stands for Analysis, Design, and Development. Implementation and Evaluation [14], [15], [16]. DOCU implements this model by going through one ADDIE cycle for every determined interval of time, usually weekly or bi-weekly. Every cycle is often called a 'sprint'. This approach was chosen because DOCU's contributors are split into two general teams: the analysis and design team and the development or technical team. Using an incremental sprint cycle enables the team to iterate and try out the application features quickly; the analysis and design team can continuously collect, analyze, and evaluate the software against new data, while the development/technical team can iterate based on the latest data and analysis. The following ADDIE-based framework model can be seen in Figure 1.

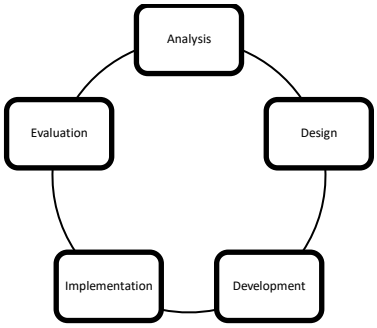

Figure 1. *ADDIE model framework*

2.1. Analysis

The first step, analysis, is usually conducted by doing one of the following: 1) literature review, 2) interview, and 3) observation. A literature review is usually performed to understand the information system's theoretical objectives and technical knowledge (e.g., current market trends, previous research, and data processing methodology). Interviews can be derived into two categories: 1) user/stakeholder interviews to gather user and stakeholder requirements of the information system, and 2) expert interviews to get experts' opinions on specific theories from specific fields and best practices. Lastly, observations are conducted to observe the behavior of the target users. There are two approaches to data processing. 1) Describe the procedures that run for MSMEs in general so that problems can be determined, 2) Use a table mapping method that contains problems, parts, and solutions. The results of this mapping will determine what functions will be built based on the problems that occur[17].

2.2. Design

The design step is done in 2 parts. First, a technical design is drafted to define the functionality, user flows, and system flows. The technical designs are usually represented using flow map, DFD, ERD, and Relation table. Flow maps are thematic maps that visualize the movement of objects, such as people or goods, between geographic regions. One or more sources are connected to several targets by lines whose thickness corresponds to the flow between a source and a target[18]. It is the standard, commonly known software development flow map, or a modified version of the feature requires a more specific way to represent it. A data flow diagram is a logical data flow model through a system that shows how the system's boundaries, processes, and

data entities are logically related. A data flow diagram is an excellent tool for summarizing and organizing detailed information about a system's boundaries, processes, and data entities, providing the analyst with a logical system map. A data flow diagram is sometimes created with an entity-relationship diagram or data normalization[19]. Developing an entity-relationship data model is one of the stages of a database designer to develop software for a database system based on the results of the model designer's conceptual and relational. The process of creating this model requires quite a long time. The data model has an arbitrary mapping concept. The database system produces entity relationships. Conceptual schemas often have a relational database describing these entity relationships as a diagram, ER diagram, or ERD. Besides that, the database structure is created when the system changes over time to clarify the diagram gradually. Based on the problems of the system development of an entity-relationship data model, an ERD base model is created to form or simplify the data, and then the entity-relationship data model is developed into a MySQL database[20]. Normalization is often carried out as a test on a relationship on an ongoing basis to determine whether the relationship is good or still violates the standard rules given to a normal relationship (you can carry out the insert, update, delete, and modify process on one or several attributes without affecting data integrity in the relationship. After a technical design is finalized, then a user interface mock-up is designed to assist the UI development[21].

2.3. Development

The development step involves developing and debugging the application logic based on the technical and UI design references. In this step. This step shows the interaction between different application components, technical quirks, and limitations. The result is an application release ready to be deployed/implemented[22], [23].

2.4. Implementation

The implementation step revolves around making the application accessible to the users. After each development build, the application is then deployed on a (virtual) private server, accessible to the internet, ready to be tested and evaluated by internal team members and then the users[24], [25].

2.5. Evaluation

The evaluation step is essential to find out the feasibility and understand the shortcomings of the information system before it's released to the public. DOCU held a focus group meeting to try out and assess the application for themselves. After each demo session, the audiences are given a questionnaire regarding the application, how it performs, and how it fits their needs[26].

3. RESULTS AND DISCUSSION

A team system is applied to the development of DOCU applications. The DOCU team consists of 2 teams whose tasks are much different but support the development of applications in their own way. Two teams carry out DOCU application development: an analysis team and an application team. The analysis team and the application team must always coordinate with each other to complete the DOCU application so that the results are satisfactory[26].

The division of tasks between the application team and the analysis team is quite simple. The analysis team is tasked with managing DOCU from a business and analytical perspective. Starting with determining what features the application needs, researching potential customers, coordinating regularly with the product owner, and planning the agenda for developing the DOCU application. Determining features is done by conducting simple research using several methods, including interviews and taking questionnaires to potential users. From the results of interviews and questionnaires obtained from potential users, the data is analyzed by the analysis team, and the results of the analysis will determine the creation of the next feature of the application. In addition to determining the next feature of the application, the data obtained from interviews and questionnaires is also used to determine the approach that must be taken to prospective users in the future and ensure user comfort when using the DOCU application. After the data is analyzed, the analysis team then creates an application design using the data that has been obtained previously.

In addition to the analysis team, the second team in the docu development team is the application team. The application team has a part of the task directly related to the application, namely the creation and development of applications and features. In the application team, there are also several divisions of functions based on the field they work on. Among them are Backend Programmers, Frontend programmers, and UI designers [27].

UI Designer oversees a user-friendly website display design. UI Designer always coordinates with the Frontend Programmer to determine whether the designed display can be implemented or not. The display design is done using the Figma application so that it can be updated in real-time and facilitate coordination with the Frontend Programmer[28]. The back-end programmer is responsible for implementing the design of the data flow created by the analysis team and making revisions if there are errors in the design received by the back-end programmer. After the data design is implemented into a database, the Backend Programmer uses the PHP Programming Language with the Laravel framework to create an API (Application Programming Interface)[29], which will then be used by the Frontend Programmer to display data on the website. The Frontend Programmer is responsible for implementing the display designed by the UI Designer to be displayed on the website. The programming language used by the Frontend Programmer is JavaScript, using the React JS framework. In addition to implementing the design made by the UI Designer, which has a design base for PC users, the Frontend Programmer also makes a responsive display for use on various devices that users, such as cellphones and tablets, will use. After the design created by the UI Designer is implemented by the Frontend Programmer, the data that has been presented using the API by the Backend Programmer is used in the application to implement features functionally.

In developing this application, agile methodology with a scrum framework is used. The choice of agile methods in the development of docu applications is because market research is carried out regularly and requires approval from the product owner, which causes the development team to have a dynamic response to any changes. The creation of new features is also done little by little. The features in the application are not determined directly at the beginning of application development. And if there is a sudden change in one feature, the development team's workflow will not be significantly negatively affected. Application maintenance and updates are also more accessible because application development is modular when using agile methodology. So, if features need to be replaced, fixed, or added, the app development team can easily do it. The docu app development team's decision to use agile methodology in app development is also supported by a recent study that proved the overall performance improvement in the creation of a digital project using agile methodology in Pakistan.

The series of work carried out by the analysis and docu application teams are as follows. First, there is the analysis stage. At this stage, the analysis team analyzes what is needed and discusses it within the team. Then, the analysis team reviews what has been formulated previously. The analysis is carried out after the analysis team gets data from predetermined sources, such as interviews with prospective users, questionnaire results from prospective users and several entities related to the application, and literature studies. The second stage is design. After the results are obtained, the analysis team creates a design for the features needed using the information from the previous analysis, which then submits it to the application team. The features required by the application are conveyed to the application team through inter-team meetings. At this stage, the application team responds to what the analysis team has formulated. Suppose the analysis team's formulation cannot be implemented. In that case, the analysis team will describe what cannot be implemented, and the analysis team will formulate new ways or new features that can be implemented in the future. This meeting will end if the analysis team's formulation can be implemented. If the application team has approved the design from the analysis team, the next application development stage can begin. The application team starts creating sprints, with the length of time agreed upon during the meeting between teams. After the sprint is created, not everyone in the application team starts working. At the beginning of the sprint, only the Backend Programmer and UI Designer started working. The Frontend Programmer could not start working because he needed the

work of the Backend Programmer and UI Designer first. The Backend Programmer created the API, and the UI Designer created the website display design. After the display design is complete, the Frontend Programmer begins to implement the display design into a display on the website and makes the display responsive. Then, after the display is finished, the API starts to be used to make the application run according to its function, such as the login function, register function, and other functions that require API. The last stage is implementation. The application that has been developed previously is then deployed to the server so that it can reach the user.

In one sprint, all parts of the application team always coordinate to complete what has been agreed upon in the meeting between teams. After the sprint is complete, a product/feature review is conducted by the product owner and both teams. Suppose the product/feature is acceptable and appropriate. Then, the analysis team will work on the next feature during the same stage of work. If the product has a mismatch, there will be a revision from the application team by creating a new sprint. After all the features have been developed, the application is then deployed to the web server, and the database is deployed to the storage server so that users can access it. After deployment, the entire application and analysis team conducts testing to ensure that there are no errors in the presentation of the application in the final stage.

CONCLUSION

The digitalization of MSMEs is crucial, especially in Indonesia, where its existence massively contributed to the entire country's GDP is still lagging when it comes to the adoption of information technology and digital marketing. These shortcomings can be alleviated by increasing the development of accessible technology catered to the needs of local MSMEs. One needs an approach that can handle and adapt to such rapid changes to develop technology in an ever-changing market trend and meet customer needs. Incorporating the ADDIE model into the development cycle proves to be effective during the development of DOCU, which needs to be able to handle the needs of MSMEs with their various and ever-changing needs.

The result indicates that bringing an information system designed to connect local MSMEs to IT and digital marketing resources and professionals increases interests and inclination to incorporate digital marketing and information technology in their business. Therefore, technology adoption in MSME can be accelerated. For further research, the application is not only web-based. However, it can be implemented using a mobile platform. So the application can be accessed via smartphone devices.

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