

Application for Mapping and Supporting Small and Medium Industries

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Abstract. One of indicators of the growth of a country is the state of progress in economic field. Empowering small and medium industries means building community independence and capability, providing wiggle room for the community to participate in utilizing their economic potential, guiding the community to materialize their choices through various concrete actions and helping them improve economic productivity and welfare. Support for economic growth is essential for small-scale economic sector which plays a great role in alleviating poverty by promoting Small and Medium Industries (SMI/IKM) program. Stages of this study were carried using Extreme Programming software development methodology. This study was carried out and could be completed in five stages namely system planning, system design, system coding, system testing and test result analysis and implementation. System testing was done using Blackbox equivalence partitioning method. The conclusion of this study on the application for IKM in Palu City is that the application developed can cover accurate locations to facilitate the government to obtain information and make decision in swift and accurate manners.

Keywords: Small and Medium Industries, Equivalence Partitioning, Palu City

1. Introduction

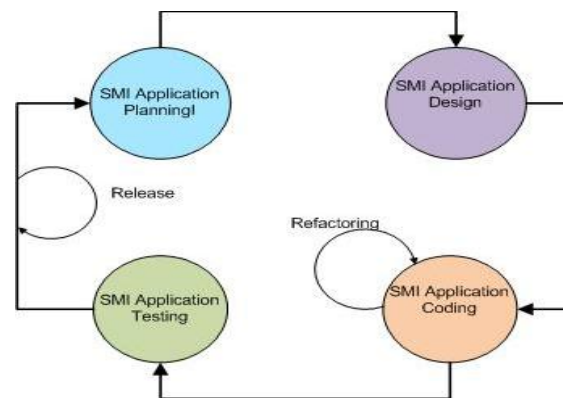
One of indicators of the growth of a country is the state of progress in economic field. This is especially true because economy is the vein of people's lives in a country [1]. Economic growth will almost certainly be accompanied with a growth in national income. The empowerment of small and medium industries represents economic empowerment to promote independence among people and materialize potential abilities and expertise in accordance with the mandate of the constitution [2]–[5]. Empowering small and medium industries means building community independence and capability, providing wiggle room

for the community to participate in utilizing their economic potential, guiding the community to materialize their choices through various concrete actions and helping them improve economic productivity and welfare. To support economic growth, there is a need for a small-scale economic sector with a great role in alleviating poverty in community by promoting Small and Medium Industries (SMI/*IKM*)[6]. In its implementation, SMI sector is an entrepreneur cohort of small industries that is able to absorb a large workforce, and benefits from its close presence among the commoners. It can already be seen where *IKM* can serve as a buffer in an economy and boost competitiveness. Attaining potential competitive edge for existing SMIs can be done by using information technology in the business world, product information accurateness, information exchange efficiency, and by expanding marketing network and market share[7], [8].

By marketing via the internet, the lack of information about products produced by SMIs, which has long been the main obstacle of SMIs, can be overcome. It is difficult for investors to find information about products produced by SMIs in Palu City. One step to overcome this problem is to create a Small and Medium Industry (*IKM*) Information System in Palu City which presents complete information on SMI Data. This research is limited to the SMIs in Palu City. Therefore, it is necessary to develop an application that facilitates data retrieval in Palu City. Mapping of industrial locations, which is an accurate presentation related to the presence of a business in an area, is highly necessary, in addition to monitor business opportunities and workforce needs, to be used as information to win investors over to invest. This study will focus on Palu City's Department of Trade and Industry. This study will discuss progress reporting and look at the distribution of SMIs in Palu City. The resulting application can provide information about various types of SMIs along with data on the location of the distribution of SMIs in Palu City in a quick, detailed, and easy way, making it easy for SMI owners to report any development of SMIs based on turnover obtained.

2. Materials and Methods

This research was carried out using the Extreme Programming software development methodology. Extreme Programming is an approach or software development model that aims to simplify various stages in the development process so that it becomes more adaptive and flexible[9]. The stages carried out in this study are illustrated in Figure 1. This study was carried out and could be completed in five stages namely system planning, system design, system coding, system testing and test result analysis and implementation.



Gambar 1. Extreme Programming

a. Planning

The planning stage consists of processes to determine the things to be done as well as the outputs produced in this study. There are five processes done at this stage, namely: (1) Topic search; (2) Determination of research objects; (3) Formulation of the problem; (4) Literature study; and (5) Determination of research objectives. At this planning stage, an interview was conducted with the division of cooperation and industrial information of the Department of Trade and Industry of Palu City. Observations were made to determine the location of SMIs and the process of development reporting by SMIs. This stage was done to produce primary data and secondary data needed in this study.

b. System Design

This system was built using a website, so that it could be accessed easily. This stage consists of three parts, namely: (1) analysis of the ongoing system; (2) analysis of the proposed system; (3) and analysis of system requirements. The analysis of the ongoing system was done by analyzing the old system that has been running on *Disperdag* that was needed in the process of making the Palu City SMI system. While the analysis of the proposed system consists of three stages, namely: (1) general conception of the system; (2) requirement analysis; and (3) identification of the software used. Furthermore, the analysis of system requirements consists of two stages, namely: (1) data requirement analysis; and (2) device requirement analysis. After the analysis stage, the next stage is the design stage. At this stage, the design of the proposed system modeling was done using three UML diagrams, namely: (1) class diagram; (2) activity diagram; (3) and class diagram. The requirement analysis stage (requirement system) is the initial stage that really determines the success in a process of discovery, improvement, modeling, and specifications.

c. Coding

Coding stage was carried out to build the web-based SMI information system. The coding process was done using codeigniter framework.

d. Pengujian dan Implementasi

This web-based SMI Reporting Management Information System was built using codeigniter framework and MySQL for storing all data. In this study, system testing was carried out using the Equivalence partitioning method. Equivalence partitioning testing is a black box testing method that divides the input domain of a program into classes of data,

where test cases can be derived[10]. The system test process is displayed in tabular form, in which the description of the test, the initial conditions, the testing procedure, the input data used, the expected outputs, the evaluation criteria of the results, the results obtained and the conclusion of the test were presented.

3. Result and Discussion

3.1 Requirements Planning Stage

At this stage, identification of the reasons for the need for a Palu City Small and Medium Industry Information System is carried out, including:

1. Disadvantages of SMI actors in Palu City in gaining market opportunity as well as difficulties faced when expanding existing market share.
2. Difficulties in distributing assistance for SMIs due to incomplete data.
3. Shortcomings in organizational structure area with human resource management.
4. Business network limitations in establishing partnership between SMI actors.
5. Unavailability of complete SMI data, making it difficult to map the types of industry that exist in Palu City.

To further improve the quality of services of the Palu City SMI Information System for entrepreneurs and the government in making decisions, this application is equipped with a mapping of the distribution of the Palu City SMI distribution.

3.2 SMI Information System Design

In Figure 2, usecase diagrams are used to briefly describe who uses the system and what they can do. The usecase diagram does not explain in detail about the use of usecase,

but only gives a brief description of the relationship between usecases, actors, and systems. Through usecase diagrams it can be known what functions exist in the system.

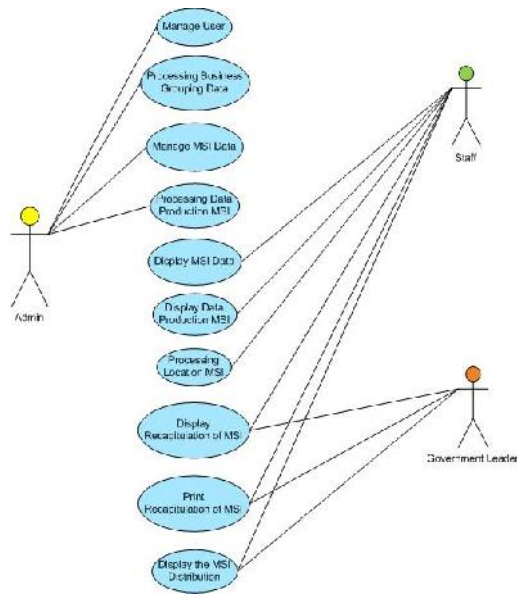


Figure 2. SMI Information System Activity Diagram

3.3 Testing

In this study, the author used the equivalence partitioning method for system testing. The reason the author used this method is because it can be used to find errors in system functionality, errors on interfaces and errors in data structures, thereby reducing problems with input values[11]. Testing design is presented in Table 1.

Table 1. Testing Application

No.	Test Class	Testing List	Test Case	Expected Results
1	Login	Login	Leaving one of the field blank	The system rejects the input by displaying a warning to fill out all blank fields
			Filling out all Field sunregistered in the system	The system rejects the input by displaying a warning saying that the data is invalid or unavailable on the sistem
2	Viewing SMI Profile Data	Viewing SMI Profile Data	Clicking on one of SMIs	The system displays SMI profile data including: name, address, data year, location map, the number of male and female employees, business permit number, location of business domicile, type of business group, business permit number, and type of business as well as a list of products owned
3	SMI search	SMI product search	Input matches the name or the description of SMI products	The system is able to display data search results
			Input does not match the name or the description of SMI products on the database	The system is unable to display data search results
4	Viewing SMI Product Data	Viewing SMI Product Data	Clicking on one of SMIs	The system displays SMI profile data including: name, address, data year, location map, the number of male and female employees, business permit number, location of business domicile, type of business group, business permit number, and type of business as well as a list of products owned
			Clicking detail button on one of products on the list	The system displays product details such as product information and photos, as well as feedbacks and ratings on the product
5	Managing Users	Viewing user list	Clicking "manage User" button	The system displays a list of users in tabular form
		Removing users	Clicking red trash icon	The system erases all data related to the user in question including the business and product owned
		Resetting User Password	Clicking Reset Password button	The system resets user password with a combination of random numbers and digits

3.4 Implementation

In every information system, the security of the data in the information system must be guaranteed so that it can provide comfort in the transaction process. For this purpose, a login feature is created where each user, whether admins, staffs or superiors, must enter the correct username and password data in order to be able to log into the application. Login page interface can be seen in Figure 3 below:

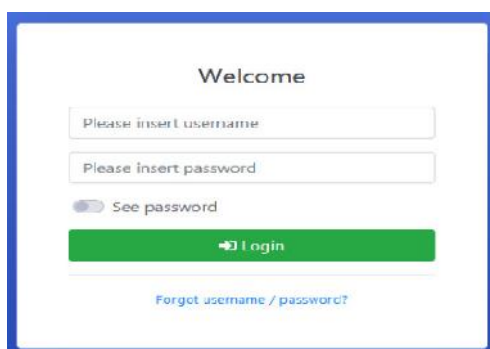


Figure 3. Login Page

After logging in, admin will enter the application on the main menu page. as seen in Figure 4. Admin will be able to immediately see the number of SMI data, the number of SIUI, number of industrial branches.

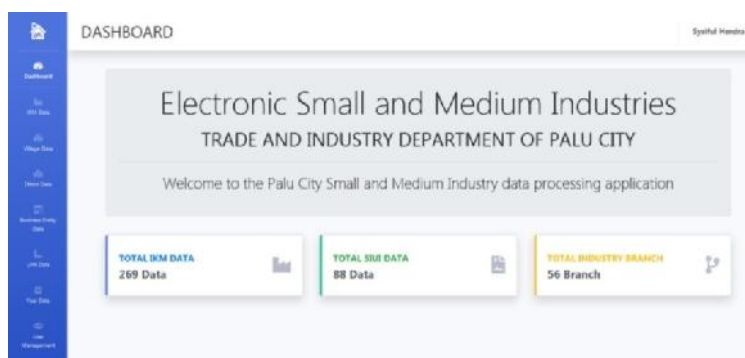


Figure 4. Main Page

4. Conclusion

The conclusion of the study on the application for SMI in Palu City is that the application developed is able to accommodate detailed information about SMIs in Palu City, including accurate locations, facilitating the government to obtain information and make decisions in swift and accurate manners.

5. Acknowledgement

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