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Design of Information Systems for Measuring the Performance of Small and Medium Industries to Improve Competitiveness

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Abstract—Small and medium industries (SMI'S) become one of the strong foundations in the economy sector of a country as well as in Indonesia. This is evident, when the country suffered a monetary crisis SMI'S was able to survive the production process. By utilizing the local potential around the environment. However, the development of SMI'S there are several obstacles among them 1) improvement of the quality of products has not been standardized process and output production results. 2) Measurement of SMI'S performance, the SMI'S actors do not understand well the importance of measurement of SMI'S performance. 3) The registration of SMI'S administration is not maximized due to the absence of an integrated information system that manages SMI'S data and potential potentials for SMI'S and local government. Thus, there is no known potential for SMI'S to confront ASEAN Economic Community. The purpose of this research is to design an integrated information system to know the performance of the SMI'S so as to facilitate the SMI'S and local government in managing and knowing the performance and potential of SMI'S in the region. In the design of performance measurement information systems There are several stages, such as : (1) analysis of the problem (2) Aanalysis of needs (3) system design (4) system implementation (5) System Maintenance. With the design of performance measurement information system can improve performance by doing measurement of target achievement and good purpose by SMI'S and local government through related service

Keywords: SMI'S, potentials, environment, economy sector.

Introduction

Along with the development of the industry, small and medium industry (SMI'S) have given many contributions to the country one of which is the contribution to Gross Domestic Revenue from 2015 to 2016 increased by 7.44%[1]. SME contribute greatly to the development of any nation and account for a large share of new jobs in countries which have demonstrated a strong employment record and are known as a primary driver for GDP[1]. Small Medium Enterprises (SMEs) in Indonesia has an important role for its great contribution to the Indonesian economy[2]. Small –Medium Industry's (SMI) is one of the strong foundation in Indonesia's economic sector [3]. However, SMIs in Indonesia have not yet measured company performance, but some also measure the company's performance from the level of profit gained and the number of complaints from consumers[1]. The lack of Government is not validation of database by name by address for SMI's actors. The Government strongly supports the development of small and medium industry, especially the local government where the SMI'S is located. Sidoarjo is one of regencies in East Java that has a great commitment in empowering SMI'S. According to data of the Department of Cooperatives, SMES, industry, trade and Energy Mineral Resources Sidoarjo Regency, that Sidoarjo has 18 districts, where 17 districts of 18 districts have a potential for small industrial centers. Data year 2013, in Sidoarjo there are more than 15,000 SMI'S and there are 82 small industrial centers as many as 32 types of commodities SMI'S. In its development, SMI'S has several constraints, namely increasing the quality of its products due to the absence of a standardized process and output production results. With the measurement of SMI'S performance, SMI'S actors do not understand the importance of measuring their performance so that they are not able to optimize their performance. The balanced scorecard (BSC) one of the methods for the measurement of SMI's performance. BSC has four perspectives: 1) Customer perspective; 2) Internal business perspective; 3) Learning and growth perspective, and 4) Financial Perspective[4]. Management of SMI'S data through the registration of administration is still not optimal because it is still done manually not computer-based. Performance is one of the factors that affects the success of an SMI'S by knowing the performance of an SMI'S can optimally have a potential that has to increase the productivity of the SMI'S. To measure the performance of the SMI'S required an information system design that facilitates the SMI'S in conducting its performance and measurement can also be used by the relevant local government to support the potential of the SMI'S. Management Information System MIS are information systems designed to provide to the manager the information needed to monitor and to control business processes and to anticipate future performances[5]. Management Information System (MIS) is a set of systems and procedures to gather information from a variety of sources compile it and present it in a readable format[6]. Management information system

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(MIS) is providing information that relates to possible future events, efficiency and output rates[7]. Management information system one of the most important tools in any organization, which aims to provide reliable, complete, accessible, and understandable information in a timely manner to the users of the system[8]. MIS is an integrated, user-machine system for providing information to support operations, management and decision-making functions in an organization[9]. Information is considered as the key and determining factor of the success in every organization and the life and death of every organization depends on the information[9]. Management Information Systems (MIS) technology, which is one of the important topics in the modern management doctrine, being an important source for the survival and durability of the organization, especially in organizations that seek to adopt a strategy of modern management that allows the involvement of workers in making decisions, exploiting opportunities, and increasing their competitiveness and creativity[10]. The role of Management Information Systems is described and analyzed in light of its capability for decision making[11]. MIS has also become a vital force for corporate efficiency with its seminal attempt in improving the business quality and productivity. The corporate world on the other hand, is continuously starting depending on automation of their major business activities such as operational, manufacturing and managerial activities, to meet its strategic business goals; known to be the corporate sustainability[12]. MIS basically involves the process of collecting, processing, storing, retrieving and communicating the relevant information for the purpose of efficient management operations and for business planning in any organizations[13]. Management Information System is a rapidly evolving IT based system that continuously creates information from raw data collected from various sources and compiles individualized reports of various kinds which helps different levels of management in informed strategic decision making[14]. System data processing was oriented toward conquest, processing, booking (storage) data while MIS (Management Information System) is directed towards utilization of data to create information governance[15]. Information Systems are characterized by being comprised of smaller systems, capable of functioning either in an integrated manner or independently. Furthermore, if they are able to interrelate, they can comprise the IS of the entire organization, therefore, an IS can be defined as the group of elements focused on processing, administering, and disseminating data and information, organized and ready for their subsequent use, generated to cover an organizational need[16]. The information system stores documents and revision histories, communication records and operational data[17]. The process of decision-making extremely based on timeliness, relevant, accurate and accessible information.[18]. Management information systems (MIS) is an organized, diverse and automated information system that is concerned with the process of gathering, storing and transferring relevant information to support the management operations in an organization[19]. Management Information System (MIS) is an organized, assorted and computerized data framework that's concerned with the method of gathering, putting away and exchanging important data to back the administration operations in an organization[20]. In the information technology (IT) area, managerial decisions on adoption of new innovative technologies face a number of challenges. The process of technological innovation is characterized by inherent uncertainty[21].

This research aims to produce a design of information systems of the performance measurement management of SMI'S to improve product quality for SMI'S, so as to increase the competitiveness of SMI'S in global market. The results of the study will have a great impact on the performance and quality of SMI'S, society and government, especially the regency of Sidoarjo through the Ministry of Cooperatives and Small and medium enterprises and the Ministry of Energy and Resources Mineral Republic of Indonesia.

Method

The stage in the design of information systems are as follows:

1.1. Analysis of the problem

Before designing an information system the first step should analyze the problem. In this research the problem is found that there is no information system that can measure the performance of SMI'S in the area so as to improve product quality and performance SMI'S. Before there was a system to know the performance of SMI'S usually government deployed a questionnaire manually that contains questions about the measurement of performance and will be answered by the SMI'S. From the question-the new will be in the sport and known results of the performance of SMI'S whether reasonably good or still there is a deficiency. With this system the performance measurement of SMI'S is not by manual but it is computerized so that it is easier and performance results can be immediately known.

1.2. Analysis of needs

Information system needs designed consist of software needs and hardware needs. Where software needs include: Operating system, PHP (Hypertext Preprocessor) programming language and Database Management System MySQL. As for hardware needs include a server computer to store and run information systems and also the Internet Service Provider (ISP) so that the information system can be accessed online anywhere and anytime..

1.3. Design System

The SMI'S information system is designed to facilitate the SMI'S in measuring its performance and facilitate the local government to determine the performance of existing SMI'S in the area so as to facilitate helping and improving the performance of the SMI'S. Information systems in the design using the Bootstrap framework to make the information system to be sweetened and responsive that will facilitate users to access the system using various types of devices such as Personal Computer, Tablet or Smartphone.

1.4. System Implementation

After the system information is completed in the system, then test will be tested to the user is SMI'S owner. Owners of SMI'S can access the system performance by inputting the URL of information system and then register, after which the user login to be able to enter the SME data and fill the performance questionnaire SMI'S and can directly see Results of the questionnaire. Local governments can also see the kusioner result of the performance information system of SMI'S with local government accounts. As shown in figure 1.

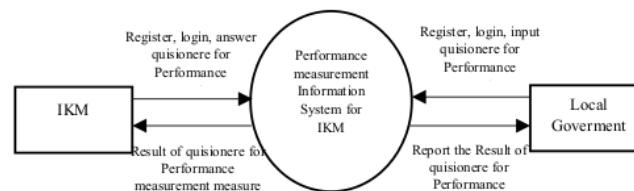


Figure 1 : DFD of Performance measurement Information System for SMI'S

1.5. System Maintenance

The final step is information system maintenance. System that has been done maintenance to keep the system running properly, according to the needs, the data of the Tang in the generate accurate, relevant and timely. In mapping it also in the maintenance of the system hardware so as not to happen damage and back up data goes well.

Result And Discussion

SMI'S's performance measurement information system has menus that can be accessed to manage SMI'S data and SMI'S performance. Data processed is the identity data of the SMI'S itself, the data owner of the training data that has been followed and the performance data. Before entering the information system of SMI'S, the owner of SMI'S must register first in order to login and go to the information system that is destined to perform data processing such as input data, edit data and delete data.

To access the information system, users can use browsers such as Chrome, Mozilla, IE, Opera, Safari, and others. Then type the URL address of the system information on the SMI'S if it succeeds it will appear the main page of the system as shown in Figure 2.

Design of Information Systems for Measuring the Performance of Small and Medium Industries to Improve Competitiveness



Figure 2 : Main page System SMI'S

1.6. Registration Main Page

On the main page there is registration menu to register identity and login menu to enter the system SMI'S. Before entering the of system, the owner of SMI'S must register by filling in the name SMI's and username and password that will be used to enter the systems as shown in Figure 3.



Figure 3 : Registration page

After the user successfully register then the user can login into the system through the login menu by entering the username and password according to the one in the input at the time of registration.

1.7. SMI'S data page

Once the user has successfully logged in to the admin page, the user can fill up the data to complete the SMI'S data according to the set by the local government which includes: Name of SME, year of standing, location, village, sub district, District, business field , products, possessions, buyers, labor and owners and if there is a data input error, the user can also repair data with the data editing facilities as shown in Figure 4.

Figure 4 : Profil SMI'S

1.8. SMI'S Training Data Page

Users or owners of SMI'S can also enter the training data that has been followed so that the local government can see the training data and can organize the training that has never been attended or that supports the performance of the SMI'S So that it can improve the productivity of SMI'Sas shown in Figure 5.

Figure 5 : Training Data Page

1.9. SMI'S Performance Measurement pages

Performance measurement is a performance assessment is a periodic determination of the operational effectiveness of the Organization, part of the organization, and its employees based on pre-defined objectives, standards, and criteria [2-3]. Performance measurement information system is needed to facilitate the SMI'S in conducting its performance and measurement can also be used by regional distribution, especially the related service. In this system, performance measurement is carried out by using a questionnaire that will be used for data retrieval with the 4-point Likert scale, and the variables that have been determined by the relevant serviceas shown in Figure 6.



Figure 6 : SMI'S Performance Measurement

The user fills the questionnaire made by the local government by choosing 4 Likert Scales such as: 1) very important, 2) not important, 3) important and 4) very importantly. Once done, the user will save the questionnaire's response and the system will automatically display the quarantine result which is a graph of the result percentage. From these results can be found that there are variables that are important in running the business and doing measurements of its business performance so that it can help improve performance. Because good performance can improve the and by applying financial performance measurements can be used to determine the next strategy and plan of work.

Conclusion

Performance measurement Information System in this research is very helpful SMI'S in knowing the performance has been done so far has been optimal or not yet so that the SMI'S can improve can improve Productivity and can assist in the subsequent improvement of the work plan. This information system also helps local governments to know the level of performance of SMI'S in its area whether it is optimal or still need construction so that the government can support increased potency, productivity and performance of SMI'S and ready to face ASEAN Economic Community.

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