

# *It-Based: The Concept of SMME Equity Empowerment of Monitoring System Analysis*

Marfuah  
Information System Department  
Universal University  
Batam, Indonesia

<https://orcid.org/0000-0002-7661-758X>

Steffi Adam  
Information System Department  
Universal University  
Batam, Indonesia

<https://orcid.org/0000-0003-0817-9028>

**Abstract**—*Small Micro Medium Enterprises (SMME) is a national economic support. It consists of micro, small, and medium enterprises through entrepreneurship it self. SMME has important role in reducing unemployment and poverty rate, providing vacancies, increasing prosperity, and constructing character of the nation. The small enterprise has some advantages compares to the medium one which are the capability of accommodating employee, local resources oriented, and flexible. Considering those points, SMME should be developed by including training in SMME field into account. There have been some coaching, training, and counseling related to SMME from various sources as in government and lecturers from particular educational institution. Furthermore, regarding the development of SMME, there are some problems that can be identified such as difficulties in looking for resource person who is suitable at his/her speciality in order to solve the problems in it, overlapping training, unsustainable training, no more further coordination between SMME and resource person after the training or workshop is done. All these problems generally happened because there is no accurate data and information regarding the kind of training that have been attended, SMME network, and What sort of problem that particular SMME face. This study identifies the concept of SMME equity empowerment of monitoring analysis IT-based, using extreme programming development approach. Starting by having an understanding on the process of business and identifying users' needs. Moreover, The framework in this case pictures how the system runs in a process of business based on users' needs. This analysis concept makes the development of system easier in the future.*

**Keywords**—*Analysis concept, monitoring system, agile method, Extreme Programming, SMME.*

## I. INTRODUCTION

SMME gives such a huge contribution on economic growth area in developed countries [1]. Global market does not only cause technology changing rapidly, but also SMME has to focus on innovation more so economy remains at how it should be [2]. Therefore, SMME has significance role in innovation [3]. Maintaining the competitiveness is complex due to some problems. [2]. Having the liberalization exists, it triggers such intense competition among companies which is still in competitive way. [4]. The problem that should be considered is about SMME's effort in dealing with sustainable oriented innovation which is establishing business network with other organizations [5].

Furthermore, the process of innovation itself is not easy, most of organizations that involve in it are facing ton of problem. However, networking does exist for reasons, and one of which is helping smaller ones to solve their problem [6]. Establishing network among organizations creates an association that has mutualism symbiosis effect [7]. Taking national and international conference, symposium, and research laboratorium that supply small organizational collaboration facilities by providing a platform in which people can interact with competitors and discuss the problem faced for example.

Thus, the development of SMME is a prerequisite on economy growth [8]. As a result, One of the most essential step is facilitating SMME's development. There have been some workshops, training, and counseling related to SMME from various sources as in government and trainees from particular educational institution. Furthermore, regarding the development of SMME, there are some problems that can be identified such as difficulties in looking for resource person who is suitable at his/her speciality in order to solve the problems in it, overlapping training, unsustainable training, no more further coordination between SMME and resource person after the training or workshop is done. All these problems generally happend because there is no accurate data and information regarding the kind of training that have been attended, SMME network, and What sort of problem that particular SMME face.

This study aims to establish monitoring system in empowering SMME evenly in Batam. The system also serves as repository of empowering activities which have been attended by particular SMME, and provides resource person who is in accordance with his/her expertise in order to solve the problem in SMME itself.

System development requires a specific method that is capable of adapting with dynamic environment in order to build a system which has the capability of meeting the changing business enviroment based on users' needs. Users are the center of functional needs collection, and feedback on the changing needs [9]. One of the system development methods is well-known as agile. Based on the evaluation of 51 engineering practices which are collected from five IT companies regarding the comparison of various agile method. The

result revealed that agile method with Extreme Programming approach has been conducted quite a lot out of 51 practices in software engineering [10]. This study uses agile method with XP approach to establish and develop monitoring system of equitable empowerment of SMME in Batam. And then, the procedures include planning, constructing, coding, and testing. These procedures support the system development quickly. In addition, XP specifically emphasizing both team's process and responsibility by setting three process as in collective coding standards, collective code ownership, and continuous integration [9].

## II. LITERATURE REVIEW AND METHOD

### A. Literature Review

Previous study which was conducted by Tian (2018) specifically discuss about system monitoring design and its implementation for the installation of floatover. The study aimed conducting field monitoring in order to support the installation of floatover itself by using four subsystem design. Moreover, the study introduced Integrated Monitoring System (IMS) in data integration that all the information quickly and accurately received [11].

Top, OO and Onur D (2018) conducted a study about the application of assessment model by using agile method. The method was developed iteratively and systematically by conducting a case study simultaneously. The model was implemented at eight companies which are software developer. The finding showed that the use of agile method is effective to achieve expected goals [12].

Meanwhile, Konnola, et al (2016) investigated various problem in using agile method in industry area. The goal was to comprehend how to adjust agile method effectively, and developed the device itself. Comparing the result of first and last survey which was continued with an interview. As a result, the finding

revealed that the interdependency between developer's work was better, the visibility of all products increased, and the need for internal documentation reduced due to the improvement of communication.

### B. Agile Method

Agile method is a method to develop iterative and incremental software with shorter cycles development [10]. One of the approaches that exists in this method is Extreme Programming (XP). XP possess basic communication principle, practicality, feedback, and courage and compliance [14]. Furthermore, XP approach is started by comprehending the process of business, and identifying users' needs. And then, all those processes are divided into several cycles in accordance of users' needs which is handled by particular system development team. Next, make an iteration planning by prioritizing certain cycles. In system development stage, there might be improvisation as users needs change. For that, the iteration must be customized. As for the next step, testing is required in order to find out whether or not there is a mistake so it can be refined on the next iteration [15].

### C. SMME

Small business is an enterprise with net assets, excluding land and business buildings which is in total of Rp.200.000.000 (13.819 USD), and annual sales is about Rp.1000.000.000 (69.087 USD) at most. Meanwhile, Medium business possess Rp.200.000.000 – Rp.10.000.000.000 (690.859 USD) [16].

### D. Method

This study was conducted through several stages as it is showed in the figure 1 below.

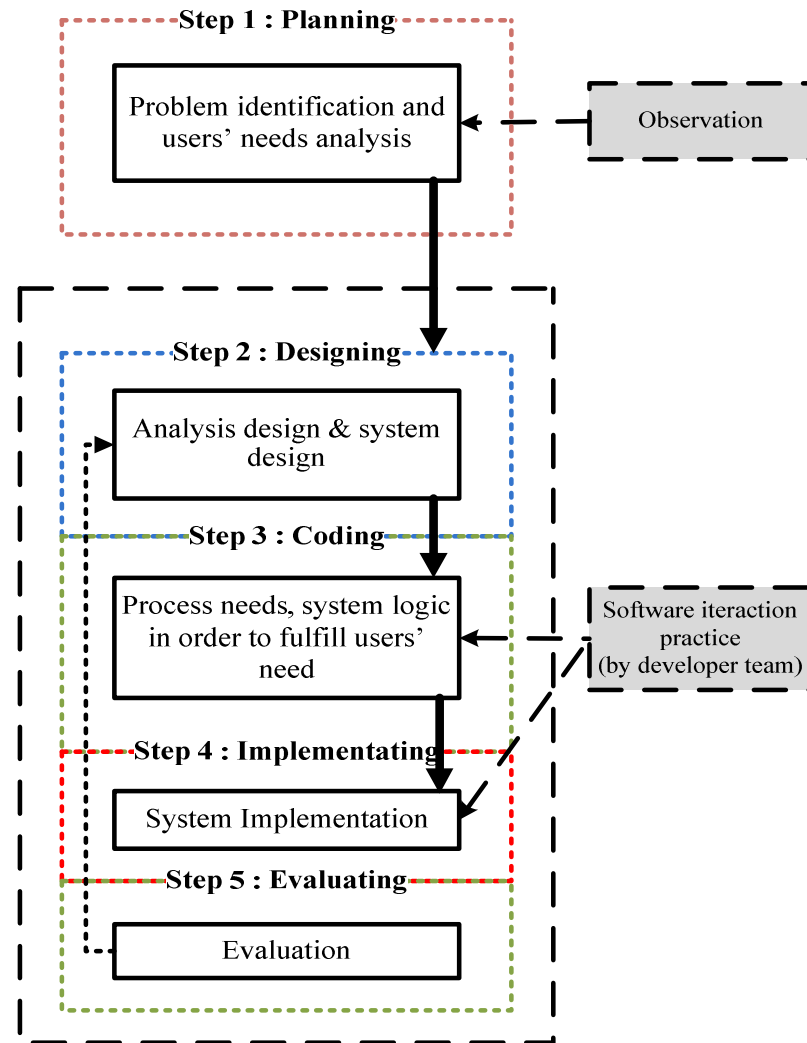


Figure 1. Research Procedures

Figure 1 above represents the procedures of this study which consists of planning, designing, coding, implementing, and evaluating.

1. **Planning** : Starting by gathering related information regarding users' needs which allow the researcher to comprehend a business context from an application. Elaborating the output, features, and function from the applications developed. This stage was executed by the leader and members of the study, along with the field workers as back up in collecting the data.
2. **Designing** : After planning, the researchers designed the system based on data gathered. The phase was conducted by leader and members of the study.
3. **Coding** : In this phase, coding is required on the system based on the process and system logic in order to obtain an expected output, and it is determined by leader and other members of the study. Moreover, staff of system developer were involved in this case.
4. **Testing** : Testing the features and function of the application. This is conducted by leader and

members of the study, along with application developers.

### III. ANALYSIS

#### A. Needs Analysis

The NA that was identified in this study are input, process, and output needs. First, input is mainly in the form of data socialization, training, workshop, and empowerment that have been participated by the SMME in the past, the biodata of resource person, data and problem that SMME face. Second, the process of helping SMME's participation. Bringing the SMME and its resource person who is expert in his/her field in order to help providing a solution based on the problem faced. Third, the output is in the form of data activities in which SMME has participated in, the problem faced by SMME, and the data of resource person.

#### B. Data Collecting Technique

The way the researchers collected the data in this study is using literature study. During the process, reading and understanding textbooks, journals, and

articles of agile methode with XP approach are required, and not to mention, system monitoring, and SMME related content too. Furthermore, Field study and direct interview between the researcher and particular SMME in Batam were applied in order to support the development of SMES empowerment distribution system.

#### IV. RESULTS AND DISCUSSION

The framework of the development of SMES empowerment distribution system in this study is agile method with XP approach, as the figure 2 illustrates below.

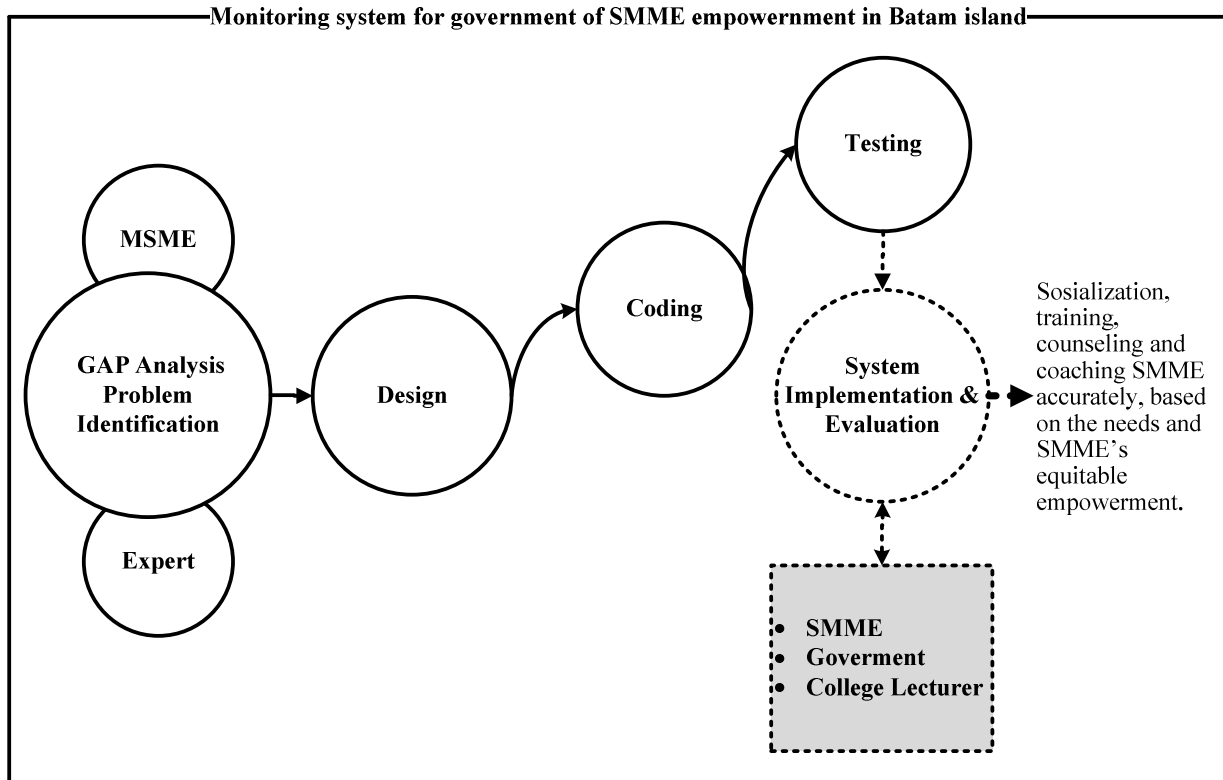


Figure 2. Framework of Monitoring SMME Empowerment Equity

Figure 2 illustrates that SMME empowerment distribution system acted as a bridge between SMME itself and other sources such as government, and lectures from particular educational institution who are holding social event, training, workshop, and empowerment on SMME. There are some information that is required in this case:

1. The resource person who wants to hold an event require specific information regarding SMME's needs or the problem faced so it is running accurately.
2. The resource person needs all the date regarding SMME's records in terms of preveious activities, so there will not be any overlapping one.
3. The SMME and the sources need more coordination on sustainable activities so it can keep growing.
4. The SMME needs all the data about resource person who are excellence in his or her field, so SMME itself is able to customize any needs.

All those information above can help the government in terms of policy making on SMME empowerment in Batam. Having identify which activities that have been participated in, the government can sort things out clearly, so the ones that have not received or participated in any training, workshop, socialization, and empowerment activities will be taken into account later on. The following figure 3 decribes the framework of SMES empowerment distribution system.

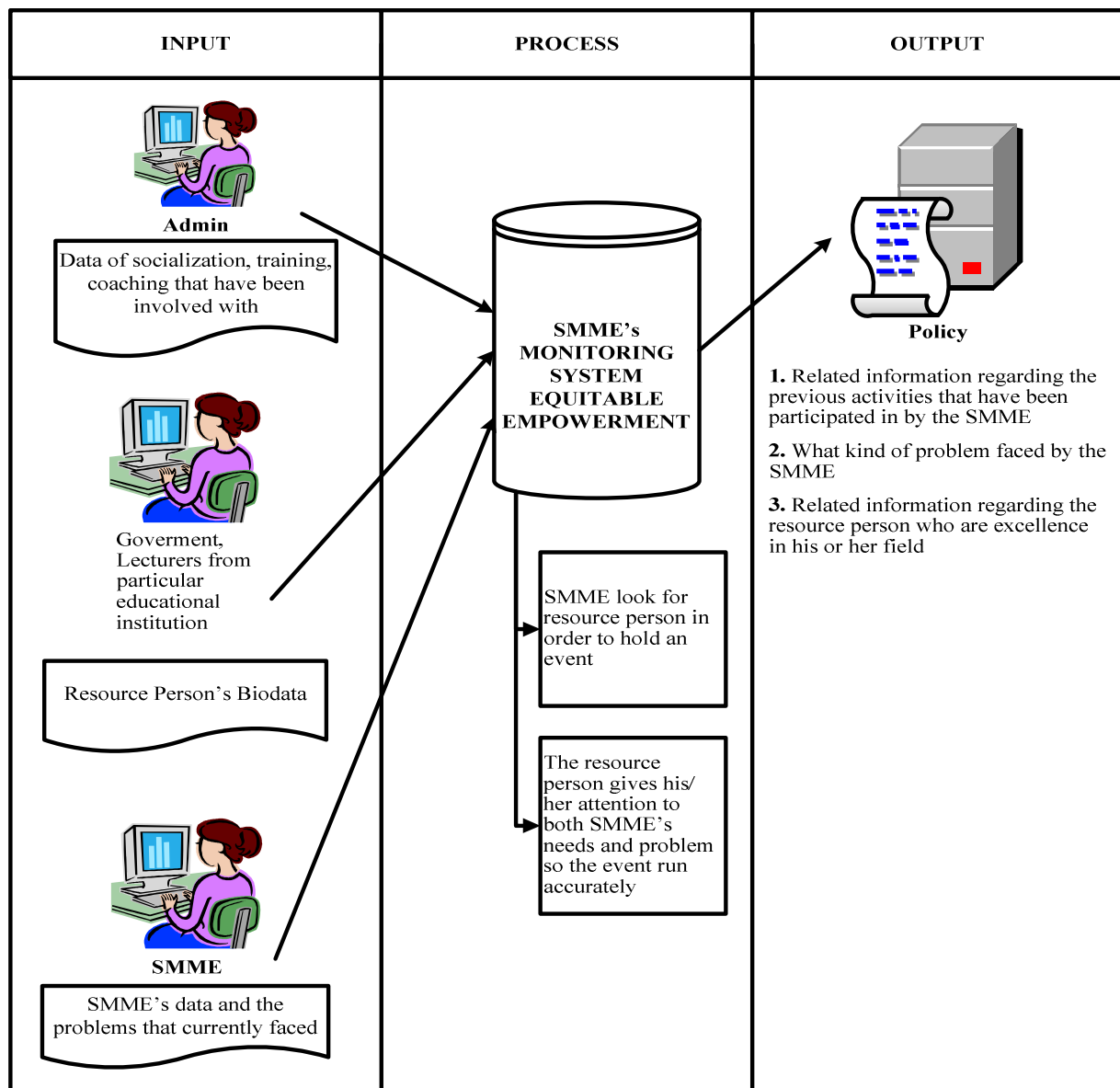


Figure 3. The Framework of SMME's equitable empowerment

## V. CONCLUSIONS

The concept of SMME's system monitoring equitable empowerment analysis IT-based in this study uses Extreme Programming (XP) approach. The approach itself was conducted by having understanding on the process of business and identifying users' need. The outcome of this study is a framework of SMME monitoring equitable empowerment system which describes how the system works on a process of business that is based on users' needs. The concept of analysis can make the establishment of the system a lot more easier in the future

## VI. SUGGESTIONS

For the next researchers, it is worth it to consider the development of concept analysis into account by adding another feature like questionnaire that can be administered to resource person. Every SMME that

participate in the activities can do this in order to build resource person's profesionalism through feedback.

## ACKNOWLEDGMENT

I would like to thank Directorate of Research and Community service, Directorate General of Research Strengthening, region X 2019 for supporting me during this study.

## REFERENCES

- [1] Manhas, V., Gupta, H., Gupta, P., 2015. Developing and validating critical success factors of TQM implementation in MSMEs of Punjab in India. *Int. J. Indian Cult. Bus. Manag.* 11 (4), 405–420.
- [2] Khurana, S., Abid, H. and Bisma, M. 2019. Determinants for Integration of Sustainability with Innovation for Indian Manufacturing Enterprises: Empirical Evidence in MSMEs. *Journal of Cleaner Production.* 1–40.
- [3] Lee, V.H., Foo, A.T.L., Leong, L.Y. and Ooi, K.B., 2016. Can competitive advantage be achieved through knowledge

- management? A case study on SMEs. *Expert Systems with Applications*, 65, pp.136-151.
- [4] Gupta, H., Nanda, T., 2015. A quantitative analysis of the relationship between drivers of innovativeness and performance of MSMEs. *Int. J. Technol. Policy Manag.* 15 (2), 128–157.
- [5] Gupta, H., Barua, M.K., 2016. Identifying enablers of technological innovation for Indian MSMEs using best–worst multi criteria decision making method. *Technological Forecasting & Social Change*. PP. 1-11.
- [6] Wincent, J., Anokhin, S., Örtqvist, D., 2010. Does network board capital matter? A study of innovative performance in strategic SME networks. *J. Bus. Res.* 63 (3), 265–275.
- [7] Kumar, R.S., Subrahmanya, M.B., 2010. Influence of subcontracting on innovation and economic performance of SMEs in Indian automobile industry. *Technovation* 30 (11), 558–569.
- [8] Eniola, A.A and Entebang, H. 2015. Government Policy and Performance of Small and Medium Business Management. *International Journal of Academic Research in Business and Social Sciences*. 5 (2). pp. 237-248.
- [9] Wood, S., George, M and Chris, T. 2013. Successful extreme programming: Fidelity to the methodology or good teamworking?. *Information and Software Technology*. 55, pp. 660–672
- [10] Shelly. 2015. Comparative Analysis of Different Agile Methodologies. *International Journal of Computer Science and Information Technology Research*. 3 (1), 199-203.
- [11] Tian, X., Et all. 2018. Design and application of a monitoring system for the floatover installation. *Ocean Engineering* .150.194–208.
- [12] Top, O.O and Onur, D. 2018. Application of a Software Agility Assessment Model – Agility Mod in the Field. *Computer Standards & Interfaces*. 1-34.
- [13] Konnola, K., Samuli, S., Tuomas, M., Tero, J., Ville, R and Teijo, L. 2016. Agile methods in embedded system development: Multiple-case study of three industrial cases. *The Journal of Systems and Software*. 118. 134–150.
- [14] Mike Holcombe. 2008. *Running an Agile Software Development Project*. Wiley.
- [15] Sheetal Sharma. 2012. Agile Processes and Methodologies: A Conceptual Study”. *International Journal on Computer Science and Engineering (IJCSE)*. 4. 894-8.
- [16] Suhardi, Banjarnahor, H, Adam, S, Kurniawan, A. The role of information technology in Knowledge management in small medium Enterprise. *Journal of Theoretical and Applied Information Technology*. 96 (24) 2018, pp.8265-8278.