

A Big Data-Based Platform: A Resilience Strategy for MSMEs during Covid-19 Pandemic

Santi Novani*, Lisandy Arinta Suryana, Devi Aditiawarman and Annisaa Novieningtyas

School of Business and Management, Institut Teknologi Bandung, Indonesia

E-mail address: snovani@sbm-itb.ac.id

Abstract - The economy in Indonesia is dominated by MSMEs. In addition to contributing to rupiah, MSMEs also play a major role in the absorption of labor in Indonesia. Unfortunately, MSMEs in Indonesia are the sectors most affected during the pandemic Covid-19. Data from the Ministry of Cooperatives and MSMEs noted that many MSMEs had stopped their operational activities because of COVID-19. However, the government has difficulty making strategic decisions due to the poor MSMEs data collection system. Therefore, this study proposes a web-based platform as an orchestration platform that will help the government (the Cooperatives and MSMEs Office and Regional Development Planning Agency) and MSMEs develop the right strategies to increase their business resilience during COVID-19 pandemic. Through this platform, the government able to collect the MSMEs data digitally and centrally while the MSMEs actors able to access the information related to MSME activities or training, consumer needs and patterns as well as exchanging information with other MSME actors to maintain their business during and after the COVID-19 pandemic. By doing so, MSMEs are expected to be able to accelerate the level of adaptation and innovation of products and services according to their needs and trends during the COVID-19 pandemic. In brief, this study will discuss the platform development phases and how it will work for both government and MSMEs actors' sides. In limitation, this platform is developed specifically for MSMEs which are operated in West Java, Indonesia.

Keywords - Business Resilience, Big Data-Based Platform, MSMEs, SMEs, Service Science

I. INTRODUCTION

The World Health Organization (WHO) has declared COVID-19 as a global pandemic in March 2020. The Indonesian government has implemented several policies such as social distancing, learning from home, working from home, and Large-Scale Social Restrictions (locally known as Pembatasan Sosial Berskala Besar/PSBB) to minimize the spread of the COVID-19 virus. This policy encourages adaptation of new habits in the community. On the other hand, it also affects Indonesia's economic growth. According to Ridwan (2020), several business actors, especially Micro, Small, and Medium Enterprises (MSMEs) in Indonesia have experienced negative impacts from the pandemic. Based on data from the Ministry of Cooperatives and MSMEs,

as many as 1,332 MSMEs spread across 18 provinces experienced negative impacts due to this pandemic, such as decreased sales turnover, distribution of goods, and difficulty in accessing business capital. Therefore, some MSMEs that experienced a drastic decrease in production decided not to continue their production for a while (Harmawan, 2020). The Head of the Presidential Staff Office explained that there were three major problems experienced by MSME players during this pandemic. First, the decline in demand because of the people's purchasing power which decreased drastically during the pandemic. Second, MSMEs find a difficulty of getting access to capital from banks. Third, MSMEs do not have the ability to finance their business because their business capital runs out which is used to cover operational costs and needs during the pandemic (Moeldoko, 2020).

In specific, MSMEs which operate in East Java, Indonesia also suffers during COVID-19 pandemic. According to Indonesia's Central Bureau of Statistics (2020), the rate of economic growth in West Java has decreased until -2.4%. Indonesia's Central Bureau of Statistics also reported that 86% MSMEs experienced a drastic decrease in income and 28.1% of them stopped their operations. Bear in mind, MSMEs in Indonesia dominate 95% of the economy both nationally and regionally. Therefore, it is important to resolve the condition of MSMEs due to this COVID-19 pandemic.

However, the government is having difficulty making strategic decisions to help MSMEs during this COVID-19 pandemic due to the lack of availability of an updated and connected MSME database (Rizkinaswara, 2020). The Ministry of Cooperatives and MSMEs stated that big data for MSMEs in Indonesia is in the severe category because of the unavailability of complete MSME data references at the regional and central levels (Hanjarwadi, 2020). Therefore, if the database of MSMEs in Indonesia is interconnected and up to date, it will make it easier for the government to prioritize capital assistance for MSMEs based on the category of MSMEs affected by the COVID-19 pandemic.

Other problems also arise from the MSMEs. In responding to problems during the COVID-19 pandemic, MSME actors need to do some innovation in their services and products offered to the public based on market demand during the COVID-19 pandemic. However, MSMEs experience several challenges in improving their business due to lack of resources.

Therefore, MSMEs are very limited in investing in new equipment and rely on several other business networks that have the right resources (Ulaga et al, 2020; Kowalkowski & Gustafsson, 2013). In addition, connectivity with the availability and access of information is also a problem faced by MSMEs. This makes it difficult for MSMEs to access information related to changes in market orientation, competition, and trends during the COVID-19 pandemic. In fact, accurate and up-to-date information sources are one of the keys that can help MSMEs in making business decisions during a COVID-19 pandemic.

Bridging all the phenomena, this study aims to develop a bigdata based platform which collects the actual MSME database. This bigdata based platform is also designed to analyze and predict the pattern and trend in the market. Therefore, this big-data platform is expected to help the government in making a strategic decision related to MSMEs during and after COVID-19 pandemic. This big-data platform is also expected to help MSMEs to access valuable information related to business such as workshop or training events, market trends, business issues etc. and help them in making strategic decision related product and or service innovation and improving their business.

II. LITERATURE REVIEW

A. Digital Platform

A literature review on digital platforms proposed by Assadullah et al (2019) and in Sutherland et al. (2018) which analyzes sharing economy platforms. Spagnoletti et al. (2015, p. 364) defines a digital platform as “a building block that provides essential functions for a technology system and serves as a foundation on which complementary products, technologies or services can be developed”. The platform is a facilitator of exchange (goods, services, and information). Transactions are mediated through complementary players who share the network ecosystem (Rochet and Tirole, 2003; Armstrong, 2006).

A digital platform is a multifaceted digital framework that forms the terms in which participants interact and a complex mix of software, hardware, operations, and networks (De Reuven et al., 2018; Gawer and Cusumano, 2014; Gawer, 2014). They provide a common set of techniques, technologies, and interfaces for many users; social and economic interactions are mediated online, often by applications (Kenney and Zysman, 2016). A digital platform is complementarily defined as “a software-based external platform consisting of an extensible codebase of a software-based system that provides core functionality shared by the modules that operate with it and the interfaces with which it operates” (Tiwana et al., 2010). The software platform is a technology meeting place where application developers and end users meet (Evans et al., 2006).

This is the "Data Age", with new data being generated from all industries and public bodies at an

unprecedented speed. This phenomenon has generated massive hype, with organizations seeking to leverage big data analytics to create value (Constantiou & Kallinikos, 2015). Big data analytics has been considered the next frontier for innovation, competition and productivity (Manyika et al., 2011).

As a result, MSMEs began to emerge pay attention to the value that data can create through the use of big data analytics. Following the rapid expansion of the volume, speed, and variety of data, substantial developments have been documented in techniques and technologies for data storage, analysis, and visualization. However, there is far less research on how organizations need to change to accept this innovation, and what business value can be derived from it (McAfee, Brynjolfsson, & Davenport, 2012).

B. MSMEs and Resilience Strategy

According to the literature Currently, most studies on the impact of disasters on businesses and their viability have been conducted in the United States and other developed countries. There are very few studies in this area in the context of developing countries. Impact of disasters on MSMEs Studies on the impact of disasters on business first appeared in the late 1980s. The first study of this nature was carried out in the United States after the Loma Prieta earthquake in 1989. resilience is understood as the ability to regain strength, vitality in recovering from disasters, failures, and traumas, and recovery to a full-fledged life. According to some literature, studies on the impact of disasters on business and business continuity have been carried out in the United States and other developed countries.

However, there is very little research in this area in contexts affecting developing countries. Impact of disasters on MSMEs Studies on the impact of disasters on business first appeared in the late 1980s. The first study of this nature was carried out in the United States after the Loma Prieta earthquake in 1989.

Resilience is understood as the ability to regain strength, vitality in recovery from disaster, failure, and trauma, and recovery to a full life. Companies (in this case MSMEs) need to develop business resilience capabilities that enable them to respond appropriately to unexpected events (such as the COVID-19 pandemic) that can threaten the survival of the organization (Lengnick-Hall et al., 2011; Walker et al. , 2003).

C. Service Innovation

Service innovation is a broad and complex concept that has been analyzed through various approaches, perspectives, and contexts (Giannopoulou et al., 2011). It

is broadly an important activity for service firms and traditional manufacturing firms (Kindström et al., 2012).

Indeed, for den Hertog et al. (2010) sustainable competitiveness is rooted in the ability of organizations to develop or improve services that differentiate them from competitors and increase value for customers.

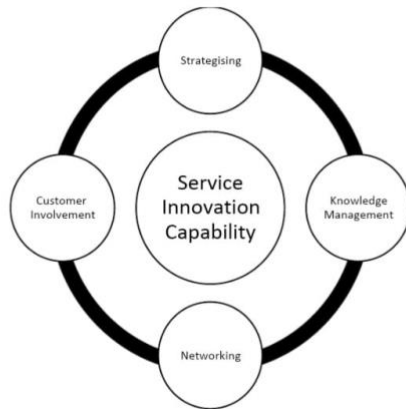


Fig. 1. The Service Innovation Capability Model

Service innovation capability describes an organisation's ability to provide value to customers by repeatedly and continuously developing new services and improving existing ones. Figure 1 depicts SIC as a multi-dimensional phenomenon composed of the four interrelated dimensions strategising, knowledge management, networking, and customer involvement.

III. METHODOLOGY

The action research involves a self-reflective, systematic, and critical approach to inquiry by participants who are at the same time members of the research community. The aim is to identify problematic situations or problems that participants deem appropriate investigation to bring about critical changes in practice (Wilkinson, 1998). Moreover, this study leads to general conclusions about the reasons for conducting action research:

1. Teaching of the future, action research was chosen because it is a professional and effective process that impacts on daily and/or future teaching.
2. Creating change, there are several obstacles faced by SMEs in West Java, especially during this pandemic. For example, expanding market reach, increasing revenue, reducing transaction and intermediary costs, speeding up processes, improving communication, and increasing staff productivity.

Those involved in Action Research experience self-reflection on their behavior, actions, and interactions with others; deliberate interventions to question and improve current practice; adaptation of research processes and methods to address problems that arise directly; and

uncertainty and openness to changing research objectives and questions as knowledge of social situations grows and deepens.

The phases of carrying out this examination are outlined in the flowchart beneath (see fig.1). To acquire information needs from the application, in-depth interviews and focus group discussions were held with stakeholders. The government that interacts with MSMEs is one of the respondents involved. From the government represented by Head of the Sub-Sector of the Economy and Natural Resources III, Regional Development Planning Agency of West Java Province, Head of the Small Business Division, Cooperatives and Small Business Office, Widyaiswara Expert Madya at the Cooperatives and Small Business Office of West Java Province, Deputy Director of the Creative Community West Java.

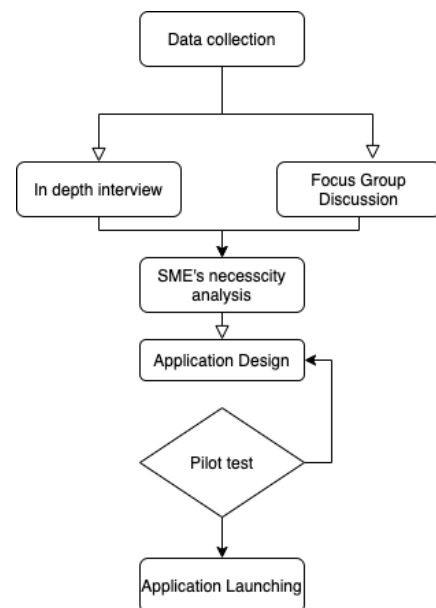
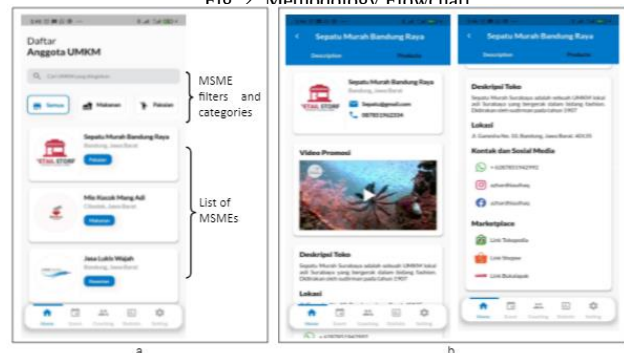


Fig. 2 Methodology Flowchart



From the results of the focus group discussions, a list of the needs for applications from the government and

MSMEs was obtained. Both parties need a forum for exchanging information in competency development, SME data collection, and media promotion. From this list of needs, an application will be made that can accommodate.

IV. RESULTS

The output of this action research is an Android-based platform that aims to obtain data from several MSMEs in West Java. Technology adaptation as a sustainable and efficient SMEs innovation as a solution in overcoming problems from the impact of the Covid-19 pandemic, due to space limitations and the readiness of Android platform-based technology on smartphones that are high and long-lived, for social problems, because it solves several social problems instead of direct application information platform, Platforms application and transfer of technology and innovation to the MSMEs community from stakeholders (West Java Regional Government) in the form of training/clinical coaching activities and MSME development events by discussing high-potential low-income markets with the aim of strengthening the SMEs ecosystem.



Fig. 2. Data Processing on The Platform

The data obtained from our platform can be processed by data analysis software and continued in the post-processing process. Then, it can analyze market trends from MSMEs so that sustainable actions can be taken by stakeholders in providing benefits to MSMEs. Thus, this platform is expected to increase the resilience of MSME businesses during the COVID-19 pandemic. Fig. 2 shows the process that occurs on the platform.

There are two categories of users who can access the platform, namely admin and MSMEs account. Both accounts will have different features. Admin account has access to download the statistical data or analysis result and update the information on activities related to the MSMEs. While, MSMEs account has access to a list of MSMEs in East Java, update their own business information, see the list of upcoming events, attend the coaching clinic, and view the results of market trends or other statistical data analysis.

To make it easier for users to access MSME information, this platform is also facilitated with a filter

menu. With this menu, users can display information based on the MSME business category (e.g., the food and

beverage sector, fashion, etc.), or the geographic location of each MSME (see figure 3). Moreover, this platform allows MSMEs to include links from various MSME social media or marketplace. This platform also provides a web page to display the MSMEs products and services. It makes this platform interesting because MSMEs not only get information about the market, but they can also market their products on one platform.

V. CONCLUSION AND DISCUSSION

MSMEs that have adopted and utilized digitalization are able to increase their productivity during the COVID-19 pandemic compared to those that have not. Although the amount of revenue earned has not returned to the condition before the COVID-19 pandemic, this situation gives a signal that digitalization is one of the hopes for increasing the resilience of MSME businesses during the pandemic.

This study adopts action research including a self-reflective, systematic and critical approach to inquiry by participants who are at the same time members of the research community. By considering the penta-helix model, this study invites several parties who represent government, academia, industry, media and society and community. However, the media contribution is still limited for the publication of the results of the FGD. Further, all those five actors in the pentahelix model will be involved in the implementation of this bigdata based platform. They also play an important role to encourage the digitalization of MSMEs.

This study held FGD by inviting several parties according to the pentahelix model. The participants of FGD represent government, academia, industry, media and society and community. The results of the FGD concluded that this big data-based platform that has been developed is indeed needed by all parties to improve the accuracy and availability of information. Of course, this will be achieved by integrating this big data-based platform with other existing digital platforms both regionally and nationally, especially those closely related to MSMEs.

However, this study has several limitations. First, the current platform is developed for all MSMEs in all business sectors but it is limited only for MSMEs which operate in East Java. Further, in order to get a helicopter view of MSMEs in Indonesia, this study needs to collect more MSMEs from various regions in Indonesia. The current geographical area limitation is expected to be a pilot study for a better platform before reaching a national scale. Second, technically, the developed platform is ready to operate. However, practically the research team

still needs to collaborate with related parties to invite MSMEs to participate as users on this platform. Therefore, future research or FGDs are expected to analyze the readiness of MSMEs to utilize this platform and formulate procedures for implementing the platform and inviting MSMEs to join on this platform. Thus, it is hoped that the features contained on this platform can be utilized optimally by all parties, especially MSMEs. Thus, this platform can have a significant impact to increase the resilience of MSMEs, especially during the COVID-19 pandemic.

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