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The Opportunities For MSMEs In The Industrial Technology

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ABSTRACT

Industrials Revolution 4.0 is an opportunity for Indonesia to increase economic growth. Economic growth can be conducted by increasing the number of Micro Small and Medium Enterprises (MSMEs). Moreover, MSMEs is involved by the digital economy through broadband, electronic business (e-commerce), social media, cloud technology, and cellular platforms. Therefore, MSMEs can grow faster and improve, give excellent services and products, and become more innovative and competitive so that productivity also increases. This is able to be an opportunity to change the processes and capture new opportunities in the market. One way to capture these opportunities is to produce good products and give excellence services. The implementation of TQM and quality assurance systems, with Quality Control Circle (QCC) or Quality Control (QC), has a significant impact on the quality of products and services which are produced by MSMEs. TQM will deliver companies to world-class services by providing good products and services so that it can make customers satisfaction. Improving quality and service can be supplemented by improving efficiency and productivity. Furthermore, companies engaged in the business sector have the main orientation on achieving the highest possible profit margins (Profit Oriented). Therefore, the collection of data in the current digital economy is the basis of all businesses in this modern era. These efforts can be done by way of more socializing big data at MSMEs. Finally, technology adoption will improve business performance. MSMEs owners and managers must develop strategies to improve efficiency, reduce costs, and get new customers, build websites, and utilize digital technology to conduct market expansion and increased sales through the Digital Economy Era.

Keywords: TQM, QCC, Technology, Digital Economy, Big Data

1. INTRODUCTION

Industry 4.0 affords a new paradigm for MSMEs industry. It is supported by the latest technologies growth. This concept offers more flexible and cheaper than traditional technology. MSMEs must be set to deal with the new possibilities in relation to their production planning and control.

Additionally, MSMEs are the main suppliers for most industries and the economic growth of the country. This reason depends on their capacity to require the expectations of their customers and MSMEs also maintains a competitive advantage in their markets (Xu et al., 2016). In achieving this goal, MSMEs need to conduct Continuous Improvement for their industrial management processes (Moeuf et al., 2016). They are able to plan, use resources, control production, measure and evaluate operational performance. Some production planning and control management methods already exist. It can be explained in Just-In-Time originating from the Toyota Production System whose purpose is to synchronize the flow through the production line with the current drawn by the client (Ohno, 1988) which has been proven in many industries.

Many theories clarify Quality Control methods. One of them is Total Quality Management. TQM is a customer-specific management philosophy that focuses on increasing processes and managing organizations through the design of procedures, statistical controls, human resource management strategies, and the application of policies.

However, it also creates new and significant challenges for each organization. Although TQM was originally implemented into the manufacturing industry, the purpose of using TQM has also continued to be extended to the service industry. Accreditation with internationally recognized quality specifications, such as; American Six Sigma and ISO 9000 Europe, has become a fundamental demand for doing business with several companies (Javorcik and Sawada, 2018).

Nowadays, expanding markets and persevering in competitive global markets require companies to provide quality products and services. The implementation of TQM has been the answer to the challenges of this global competition. TQM will deliver the company to world-class service. Furthermore, providing the type of quality products and services needed for customer satisfaction has acquired a competitive benefit and a greater market share. It has become an effort for modern industries to improve organizational performance over the past few years.

In Indonesia, the number of Micro Enterprise companies is 57,189,393. It also involves 104,624,466 employees in 2017. Based on the data, it can be concluded that the role of MSMEs increases job recruitment. Therefore, the MSMEs significance of employment growth in Indonesia is not only reflected in static conditions, but it also must be a big business and dynamic conditions. In detail, Figure 1 explains the statement comprehensively.

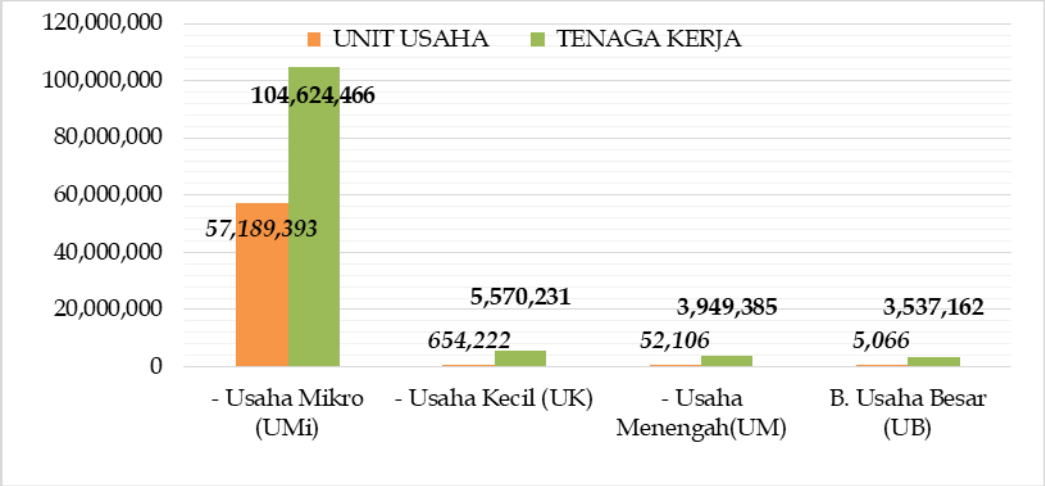

Figure 1: The Employment Comparison of MSMEs

Meanwhile, Wignaraja (2012) showed that Indonesia's MSME participation in global production networks is still low in Table 1. Using data from the World Bank Enterprise Survey in five ASEAN countries, Malaysia, Thailand, Philippines, Indonesia and Vietnam explain Indonesian MSMEs involvement in global production is only 6.3 per cent. This figure is below Malaysia, Thailand, Vietnam and the Philippines.

Table 1: MSMEs Involvement through 5 ASEN Countries in Global Production Network

Firms Type	All Countries	Malaysia	Thailand	Philippines	Indonesia	Vietnam
PN Firms as a Percentage of all firms, %	37,3	59,7	59,3	26,9	14,5	36,4
MSMEs in PN (1-99 employees) as a percentage of all MSMEs, %	22,0	46,2	29,6	20,1	6,3	21,4
Large firms in PN as a percentage of all large firms, %	72,1	82,4	91,1	51,1	52,0	64,6

Source: Wignaraja (2012)

Moreover, the Ministry of Cooperatives and MSMEs of the Republic of Indonesia in 2017 explains there is only 3.79 million of micro, small and medium enterprises (MSMEs) has used internet technology to market their products. This number is only 8 per cent within the total of MSMEs in Indonesia. Meanwhile, based on reports from Deloitte in 2015, there is still around 36 per cent for the offline MSMEs. There is 37 per cent for basic online capabilities, such as computers or broadband access. There is only 18 per cent have moderate online capabilities, such as web and social media. 9 per cent MSMEs is

sophisticated online businesses with e-commerce capabilities.

The additional constraint of MSMEs is the lack of access to information, especially market information (Ishaq, 2015). This is an obstacle in selling their products due to limited access to the market information. As a result, it impacts on low market orientation and weak competitiveness at the global level. Therefore, improvement or transformation to the online era is not sufficient without the presence of good products and quality services in using the appropriate technology to assist production and marketing.

Technology has been an important trigger of business productivity for decades, such as computers in the 1980s, easy-to-use software in the 1990s, and the internet in the 2000s. Nowadays, digital technology is developing rapidly. They are cloud, smartphone, application and data analysis, having a wide-ranging impact on consumers and businesses around the world. For customers, technologies development, such as social applications, is suggestions to facilitate the exchange of knowledge and information (Aziz et al., 2018).

Directly, technology adoption, especially digital technology will improve business performance. MSMEs owners and managers who have used new technology, connected to the internet, built websites, and developed strategies for various reasons to improve efficiency, reduce costs, and get new customers.

Therefore, this study discusses how to improve the efficiency and productivity of MSMEs through accelerating the quality assurance system and the use of technology especially digital technology to acquire more opportunities in the industrial technology era.

2. IMPLEMENTATION OF TQM AND QCC ON MSMEs

In Indonesia, the introduction of TQM concept was in the early 1980s and the ISO 9000 quality assurance system in the early 1990s. The companies implementing TQM or quality assurance systems have increased. However, they still have problems in implementing TQM, especially in the MSMEs sector. The implementation of TQM in Indonesian shows that organizational culture treats an important role in the implementation and TQM has a positive effect on MSMEs performance (Aziz, 2018, 2019). In addition, there are 30 obstacles in implementing TQM in Indonesian MSMEs. Knowledge and ability of managers do not support the application of TQM and quality assurance systems. Because of this problem, many companies have experienced difficulties and encountered obstacles in efforts to implement a management system (Aziz, 2018). The implementation of TQM and the quality assurance system, with the inappropriate implementation of the Quality Control Circle (QCC) or Quality Control (QC), has a significant impact on the quality of products and services produced by MSMEs. According to Deming (1986), superior and competitive product or service quality is a very important element and contributes directly to sales and strengthens the company's position in the market being entered in identifying the problems and finding the appropriate solution, and giving education about the implementation of TQM, especially for MSMEs.

The first company to intentionally adopt a quality management culture in Indonesia is Astra International, a Japan-Indonesia Joint Ventures. In October 1983, Astra's Total Quality Control (ATQC) began a comprehensive training program at all levels of company management. Quality activities, such as the QCC and other TQM activities had been successfully implemented. Meanwhile, the successful implementation of quality management in several countries, academics and practitioners began to spread the concept of TQM through quality control (QC).

The previous research is conducted in many countries. It shows that the role of QCC in improving company performance and competitiveness. Munawar (2011) examined the relationship between the application of QCC, work culture and work productivity. Furthermore, it found a positive and strong relationship between the application of QCC and work culture and the application of QCC and work culture impacted on the work productivity of employees both jointly and partially. Whereas Disa (2011) found the most influential indicators on the success of QCC are the commitment of top management, leadership and facilities, and a comparison between before and after the implementation of QCC showed that there was a change in a better direction related to efficiency, product quality performance, labour productivity and product reject material. From the study conducted concluded that success in the application of QCC will improve the efficiency, productivity and performance of MSMEs. The implementation of a quality management system will be able to improve the competitiveness of the company.

3. THE CONSTRAINTS ON IMPLEMENTING TQM

Many Micro, Small and Medium Enterprises (MSMEs) are still insufficient to implement a quality management system in their company. This is also due to a lack of understanding to TQM implementation which they do not know and understand. Constraints and obstacles in implementing TQM are unlimited; they can happen in all sectors, both in the manufacturing sector, services, government, and education.

Many studies have addressed obstacles to the application of TQM. They explore and propose obstacles factors which are appropriate to the environment, organization, culture, and location of the organization. According to Dubey and Bansal (2013), the obstacles in implementing TQM in government and organizations are the principles of TQM, Management barriers, Organizational Culture, and Change management.

According to Wibaselppa and Aziz (2018), there are 30 obstacles in the implementation of quality management or TQM in Indonesian MSMEs so that the implementation does not work successfully. From the results of these studies, the four biggest obstacles are: 1) The high cost of consultants and training programs; 2) Improper conditions for implementing TQM; 3) Lack of preparation (no budget and lack of sponsors); 4) Uncertain perception of the TQM process as an extraordinary added value and a need to create better performance.

4. THE IMPACT OF TQM AND QCC IMPLEMENTATION

The main philosophy of TQM and QCC is continuous improvement in the process of developing organizational systems improvement, employee strengthening, and empowerment. Most of the Quality Control Circle (QCC) activities are focused on improving quality, reducing returns, reducing costs and creating facilities (Hoorzad et al., 2018). The purpose of implementing the Quality Circle is to reduce costs, motivate employees and encourage teamwork. On the other hand, improving quality and productivity, improving communication within the organization, improving the quality of products and services, creating a conducive environment, and developing a positive environment, attitudes and involvement in the decision-making process contribute to the development and improvement of organizational processes.

The fundamental of quality management is customer satisfaction by delivering flawless products at lower costs. This is the goal of the TQM and Quality Control Circle Implementation. The implementation of Quality Control Circle (QCC) is a strategic tool to improve the production process through adding value and eliminating waste, use together with traditional quality models, obtain cultural change, become representatives of final customers, and eliminate waste through QCC activities for each collaborator (Nemer and Viera, 2018).

The implementation of Quality Control Circle has successfully support MSMEs in Lampung to improve their performance. The Quality Control Circle and Work Productivity have good significance. Furthermore, this will have a better overall performance impact (Aziz et al. 2019). Quality, productivity, and operating costs are important variables in improving company performance.

Productivity measurements for the success of QCC include quality, scrap, infrastructure costs, quantity, marginal costs, equipment, work safety and accidents, maintenance and free time. As for attitudes and relationships including mutual trust, skipping work, communication, superior-subordinate relations, work complaints, use of skills, personal satisfaction, group membership, type and number of problems solved Crocker et al., 2004). Quality Control Circle process is seen from the structure, influence, problem-solving, monitoring and openness. The next measurement is a subjective attitude which is about the influence of the Quality Control Circle on the organization. Mallur and Hiregoudar (2010) conducted a study to find out the level of practice in the application of the TQM element and also to find the factors most felt by Small and Medium Enterprises (SME) manufacturing companies. In Indonesia, Munawar (2011) conducted a study by viewing from indicators of successful implementation of TQM. Meanwhile, according to Aziz (2019), there are 18 indicators in achieving the Quality Control Circle Implementation. The indicators are namely: 1) Improving employee skills; 2) Improving production quality; 3) Conducting continuous improvement in product quality; 4) Reducing consumer complaints; 5) Reducing the cost of moving material in the production process; 6) Reducing production defects; 7) Packaging time efficiency; 8) Reducing the reuse of scrapt

products; 9) Optimizing the production schedule according to planning; 10) Reducing engine maintenance costs; 11) Tendency to reduce production costs during production; 12) Shortening the duration of production without reducing quality; 13) Improving the efficiency and productivity; 14) Reducing inventory costs; 15) Achieving the work targets in accordance with standards; 16) Improving competence in work skills; 17) Shortening the work procedures; 18) Reducing work accident rates.

5. STRATEGY ON IMPROVING MSMEs COMPETITIVENESS

The use of effective and efficient technology is more important for MSMEs. In the digital technology era, MSMEs that do not use technology will find the constraints to compete and have serious problems. On the other hand, technology is getting faster and more affordable. Nevertheless, it will require a very high cost in total investment. For that, MSMEs can collaborate with other organizations where there is an overlay in the goal. Increasing the competitiveness of MSMEs is a major factor in increasing their sales and markets. According to the Organization for Economic Co-operation and Development (OECD) states that competitiveness is the ability of an organization to generate income and jobs that are relatively high and sustainable in the face of international competition. Therefore, MSMEs competitiveness is a phenomenon at the micro-level of the company.

According to The Global Competitiveness Report, in 2019 Indonesia's ranking will be 50th out of 141 countries. This shows the need for improvements made so that the investment climate becomes better and MSMEs can improve their performance. For this reason, various general factors that hinder the improvement of MSMEs competitiveness must be addressed.

Some of the obstacles of MSMEs in improving their competitiveness are the problem of lack of raw materials which must be imported from other countries for the production process, technology, marketing of goods, funding, availability of energy, infrastructure and information. In addition, internal problems also occur, such as human resources and innovation. According to Sari et al. (2015) there are six factors that can increase the competitiveness of MSMEs, namely: 1) Human resources (productivity and innovation); 2) Ease of Doing Business; 3) funding access; 4) Market access; 5) Infrastructure, logistics and telecommunications; 6) business cycle. Meanwhile, according to Chyau (2005), Potential benefits of information and communication technology for MSMEs include increasing efficiency, reducing costs and expanding markets both locally and globally, empowering MSMEs to participate in the knowledge economy by facilitating connectivity; help create and deliver products and services on a global scale and provide access to new markets.

Therefore, the use of digital technology is one way to improve the competitiveness of MSMEs. They can use the Internet and e-mail for better external communication to get business information. In Japan, the most common use of the Internet is a general information search. Other uses include communication via e-mail, providing information

about company products, services, and technology through the company's Web site, exchanging orders with regular customers, recruiting and receiving customer feedback. Some MSMEs buy some standard materials, office equipment, and software through the Internet. Nevertheless, there is only a small proportion conduct e-commerce B2C and B2B Internet for non-standard products.

The impact of ICT on MSMEs will only be significant after doing a whole-analysis of the conditions. It must be encountered in order to successfully adopt ICT expectations on the positive impact of ICT and the characteristics of individual companies (finance, technology, personnel resources, structural flexibility etc.) are closely related. Therefore, ICT adoption is recognized as an important condition. It empowers MSMEs to consider information and communication technology as an important implementation in their business to take competitive advantage from global markets. Moreover, several researchers require identifying the impact of ICT adoption in the private sector and understanding the elements and environmental factors important to the success of company development. Therefore, Manochehri et al., (2012) stated that in order to benefit from the adoption of ICT, to provide better services and explore new business opportunities, there must be at least some conditions that must be met: Skilled ICT and Budget to invest in ICT. These conditions must be met to achieve the best results. A similar group of conditions that required ICT adoption was highlighted in the work of Ollo-Lopez and Aramendia-Muneta et al., (2012). All determinants and ICT adoption factors analyzed in the previous scientific literature can be classified into three groups: factors related to company staff that will use ICT, factors related to company characteristics and factors related to the environment where the company operates. Lopez-Nicolas and Soto-Acosta (2010) found that the perceived benefits, knowledge and skills of ICT, government support are also a significant element of ICT adoption. In addition, the organization's microclimate and organizational willingness to adopt ICT are related to macro-environmental factors and expected benefits.

ICT also impacted the flexibility of organizations and companies that adopt ICT tend to perform better in the market and more easily differentiate products, services, etc. Aramendia-Muneta et al. (2012) stated that the adoption of ICT seems to have a positive effect on productivity, directly or indirectly, dependent on the sector and has great potential to support sustainable development. In addition, the use of e-mail, e-commerce, and social media networks have significantly reduced physical transportation involved in mailing, banking, advertising and purchasing of goods (Manochehri et al. 2012).

Santos and Brito (2012) found that the contribution of ICT investment to economic growth in the US for the period 1960-1990, reveals that half of the economic growth in the US was caused by ICT investment. It also refers to a World Bank study of a sample of 20,000 businesses in 50 developing countries, which proves that sales grow faster, productivity is higher and also employee growth is faster in companies that use ICT. However, research usually focuses on the effects of ICT that are direct and easily measured (e.g.: growth, productivity, profits, etc.). Meanwhile, indirect effects are generally less studied in ICTs on SME performance.

6. STRATEGY ON IMPROVING MSMEs MARKETING PERFORMANCE

The role of ICT in marketing ICT offers companies a variety of possibilities to improve competitiveness and market access that includes; provide mechanisms to access new market opportunities, facilitate product innovation, accelerate market transactions and intensify the use of information, knowledge and communication in the process. (Fulantelli and Allegra, 2003).

ICT is also closely related to human knowledge, communication, and intelligence. It acquires new types of innovation in management, organization, and business models. Companies can get significant from ICT in reducing transaction costs, managing inventory control, improving quality control, and accessing to wider market spaces and global networks (Fulantelli and Allegra, 2003). ICT provides information channels that facilitate the separation of information from their physical repositories to allow access and transmission (KIPPRA, 2006). The application of ICT can be a catalyst for company competitiveness by increasing access to information, increasing commodity and service trade and in achieving efficiency gains in resource allocation (Fulantelli and Allegra, 2003). Market access in developing countries is a major challenge for small businesses due to market imperfections that can be attributed to the lack of market information, lack of relationships between actors in the supply chain, distortion or absence of input and output markets, high transaction costs and high presence of intermediaries trading. There are various strategies to improve market access where the use of ICT is one of them. Strategies that increase market access greatly impact small business performance (Shepherd, 2007).

ICT offers MSME flexibility in trading by enabling 24-hour trading, unlimited market space, and utilizing MSMEs to compete with large companies on the same platform. In addition, ICT facilitates remote access to knowledge, suppliers and an unlimited environment, offering MSMEs the ability to provide products and services on different platforms that are easily accessed. ICT can be used to reduce barriers to entry to different market segments exposing SMEs to a wider customer base (Lloyd and Kroeze, 2008). ICTs can assist MSMEs to participate in strategic regional and international markets for competitiveness, growth and further development (Ramsey et al., 2003). Access to global markets offers a number of business opportunities, such as new niche markets, the possibility to exploit economy scale and increase technological capabilities.

ICT increases the productivity and operational efficiency in certain business processes. It is not only increased by reducing costs, but it is also increased by impacting intangible assets, such as improving quality in the design process or improving the life cycle. This technology assists more efficient use of information between workers and management and increases interaction among employees. The achievement of ICT investments will increase sales, inventory turnover, productivity, customer satisfaction, quality, flexibility and speed in product delivery.

7. BIG DATA ON DIGITAL MSMEs GROWTH

The entrepreneur must be able to follow the changing trends by utilizing information technology to push business activities and increase competitiveness. The curious phenomenon to be anticipated in the IoT era is the occurrence of Big Data. It is the volume of Big Data, it is also both structured and unstructured data. For the entrepreneur, Big Data can be an important instrument in running a business. Big Data can be analyzed quickly by using the software as a component in making better decisions and strategies (Zikopoulos and Eaton, 2011).

Big data is a hot issue in the business. The big growth in the quantity of data is collected and stored by companies around the world in the last few decades and it is undeniable. The ability to access and analyze this data quickly becomes increasingly important. Principally, Big Data is more about delivering the quality information needed in a business. Big data also is about how to make a business to be better by predicting future trends. It certainly must be utilized by businesses in Indonesia, especially as one of the bases of the economy itself. Therefore, a company must have a quality data source that is used for company purposes.

Theoretically, data collections have characteristics. They are volume, velocity, variety, and veracity. It requires the ability to capture, process, store, manage, and analyze the data. Zikopoulos and Eaton explain the Data Characteristics as follows:

a. Volume means having a very large amount. The size of big data can extend billions of rows and millions of columns.
b. Velocity is big data that produced and grows very fast.
c. Variety has complex data types and structures. Big data is generated from various data sources with diverse data formats and structures.
d. Veracity is data ambiguity where the data we have is still full of uncertainty about its validity.

Furthermore, companies involved in the business sector have the main orientation on achieving the highest possible profit margins (Profit Oriented). Therefore, the collection of data in the current digital economy is the basis of all businesses in this modern era. Digital technology is able to facilitate MSMEs in product marketing. Meanwhile, the data is able to analyze the marketing patterns that occur in the community. The use of data and digital technology will eventually be able to help SMEs to market their products more precisely on target, faster, and will be more in line with market choices. But this has not been able to catch up with the existing big businesses. With the rapid flow of information, marketing analysis can also be done in real-time. In the end, the processing and utilization of big data are one of the solutions to these problems.

Furthermore, MSMEs can use big data to make better marketing strategy decisions by

knowing customers and understanding how they interact on different social media. Having a lot of information and being able to analyze make MSMEs able to deliver the right message to the public so that they buy products made by MSMEs (Sari and Santoso, 2019).

However, the lack of knowledge about big data and the need for qualified human resources will be the constraints in developing this technology in MSMEs. Therefore, MSMEs in Indonesia need to work out special ways to get to know big data and take the initiative to utilize this technology in developing their business. These efforts can be done by way of more socializing about big data to SMEs (Hasibuan, 2016). In addition, assisting MSME which will utilize big data also needs to be conducted so that the utilization of this technology does not stop in the middle of the road because of the need for qualified ability to use it. This can encourage more MSMEs to utilize big data technology so that MSMEs in Indonesia are increasingly developing and more internationally competitive.

8. CONCLUSION

Opportunities for Indonesian MSMEs in the era of industrial technology are very wide. Extend the market and business development can be completed by improving the quality of products and services as well as the use of technology, especially information technology. The application of TQM and QCC will improve the quality of products and services as well as improve operating performance and company performance. There are 30 factors of obstacles in the application of TQM and 18 indicators of its success. By acquiring this finding, MSMEs can increase the level of success in implementing TQM and QCC. MSMEs can also acquire the constraints to consider their specific conditions by a better understanding of how their organization works.

Several constraints of Indonesia's MSME competitiveness were discussed in the previous section. Some of the obstacles were the problem of lack of raw materials which must be imported from other countries for the production process, technology, marketing of goods, funding, availability of energy, infrastructure and information. In addition, internal problems also arise such as human resources and innovation. Furthermore, the lack of knowledge about Big Data and the need for qualified human resources will obstruct the development of this technology in MSMEs.

Meanwhile, the use of ICT provides a great advantage for MSMEs in increasing their productivity and markets. ICT enhance MSME flexibility in trading by enabling 24-hour trading (Real-Time), unlimited market space, and utilizing MSMEs to compete with large companies on the same platform, access to knowledge. It will impact on innovation enhancement, suppliers, unlimited environment, reduce barriers to entry into different market segments, expose MSMEs to a broader customer base, and increased use of Big Data in improving business processes to MSMEs.

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