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Strategy for developing micro small medium enterprise clusters using business model canvas and manufacturing system design

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Abstract. City A has potential for Minor Small Medium Enterprises (MSMEs) to develop their businesses because of the support given by City A Government. This study aims to assist the City A Government in developing MSMEs by forming a cluster system. The steps are taken by calculating the flexibility of MSMEs using the integration of Business Model Canvas (BMC) and Manufacturing System Design (MSD) in the former P, Q, and R District. Clusters are categorized into two forms based on the average value of flexibility obtained. Clusters in the first category are categorized as small clusters, where MSMEs have an average rate of flexibility <50%. While the clusters in the second category are categorized as large clusters, where SMEs have an average rate of flexibility> 50%. Based on the calculation results obtained, a small cluster of 14 MSMEs and a large cluster of 23 MSMEs. The cluster developed includes several related stakeholders, namely the core industry, supporting industries, professional associations, educational institutions, financial institutions, research institutions, and government agencies. With the development of clusters based on the BMC and MSD approaches, MSMEs players can respond to a dynamic market.
Keywords: Canvas Model Business, Cluster, Manufacturing System Design, MSMEs.

1. Introduction

The Government's efforts to improve the economy in Indonesia is by developing micro, small and medium enterprises (MSMEs). MSMEs become a source of income for the wider community due to large factors. Based on the Ministry of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia, MSMEs is able to contribute the number of Gross Domestic Product (GDP) greater than Large Enterprises (LE) throughout 2009 to 2013. The achievement of GDP from MSMEs reaches more than 50%, while GDP from LE reached below 50%.

The role of MSMEs can also be the backbone of the economy in a region. In City A, the number of MSMEs always dominates than the number of LE. This can be seen from the existing SIUP data. The large number of MSMEs did not have much impact on the City A Regional Gross Domestic Product (GRDP). It was noted that the rate of City A's GRDP in 2016 reached 6.07% which was influenced by various sectors. The sector of providing accommodation and drinking food has a contribution percentage of 8.93%. The financial and insurance services sector has a percentage contribution of 7.63%. Whereas the manufacturing sector which includes MSMEs players has a small percentage contribution, which is 4.91%. The small percentage of contribution from the processing industry sector is an important point of the City A Government to develop so that the percentage contribution rate can increase. This is in

line with the 2016-2021 City A Government's vision and mission that supports the development of the processing industry, in this case the MSMEs. The vision of the City A Government is "City A is a vibrant city with a character and ecologically based global competitiveness". While one of its missions which is the 9th mission relates to strengthening the competitiveness of local economic businesses, product and service innovation, also the development of creative industries.

Efforts to realize the mission of the City A Government to run well require the involvement of educational institutions through community service activities. The activity was carried out in three regions in City A, namely P, Q, and R District. The three regions were chosen because of the large number of MSMEs and various problems experienced by MSMEs. Common problems that are often experienced are lack of human resources, low productivity and production flexibility in responding to demand, lack of workers' skills, low levels of product innovation, and others. The condition of these MSMEs has shown the opposite condition to the conditions that should be expected by the City A Government in accordance with its mission target. Based on this background, this study was addressed to the City A Government by providing recommendations for the development of cluster systems for MSMEs in the P, Q, and R District based on the Business Model Canvas (BMC) and Manufacturing System Design (MSD) approaches. The cluster system is considered to be able to overcome the problems experienced by SMEs and can overcome increasingly competitive market competition (Ministry of Cooperatives and SMEs, 2007). Cluster development is based on the category of average value of flexibility. The assessment category used is divided into two, namely a small cluster with a value of flexibility <50% and a large cluster with a value of flexibility >50%.

2. Methods

2.1. Early Identification Phase

In the Identification Phase, the literature study and field studies will be carried out. Literature studies are used to get references about theories that will be used to solve problems. Field studies were carried out by observing MSMEs in the P, Q, and R District. Then, the formulation of the problem will be determined and the determination of the research objectives to be achieved.

2.2. Data Collection and Processing Phase

In the Data Collection Phase will be collected primary and secondary data. Primary data is obtained based on direct observation in the field. The primary data obtained includes the MSME business profile data, production data, production time data, and other questionnaire data. While secondary data is obtained from the Central Statistics Agency (BPS), the Ministry of Cooperatives and MSMEs, and the City A Government Performance Report. The data processing process is done by calculating the level of flexibility of MSMEs with the integration of BMC and MSD and grouping MSMEs according to cluster development categories.

2.3. Analysis and Repair Recommendations

Analysis is carried out on the results of data processing that have been carried out in the previous stage. After doing the analysis, a repair strategy is recommended by developing a cluster system. The cluster developed includes several related stakeholders, namely the core industry, supporting industries, professional associations, educational institutions, financial institutions, research institutions, and government agencies.

2.4. Phase Conclusions and Suggestions

At this stage carried out by drawing conclusions in accordance with the objectives of the research conducted. Then give advices for improvement or further research development.

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3. Result and Discussion

3.1. Calculation of MSMEs Flexibility

At this stage carried out by drawing conclusions in accordance with the objectives of the research conducted Flexibility calculations are carried out on MSMEs located in the area of P, Q, and R District by integrating BMC and MSD. BMC covers 9 aspects of assessment, namely key partners (BMC 1), activities (BMC 2), resources (BMC 3), value proposition (BMC 4), customer relationships (BMC 5), channels (BMC 6), customer segments (BMC 7), cost structure (BMC 8), and revenue model (BMC 9). The MSD assessment also covers 9 aspects of assessment, where each aspect has a relationship to each aspect of BMC. MSD aspects include customer demand (MSD 1), production capacity (MSD 2), production rate (MSD 3), utilization (MSD 4), availability (MSD 5), manufacturing lead time (MSD 6), work in progress (MSD 7), Basic layout design (MSD 8), big picture mapping (MSD 9).

$$dof_{BMC\ j} = \sum_{i=1}^{n} W_{ij}.dof_{MSD\ i} \quad (1)$$

The main indicator used in this calculation is the degree of flexibility (dof) in the form of percentages. The contribution weight of the MSD element in BMC can be defined through the Wij variable, where i is the MSD variable and j is the BMC variable. Based on the results of flexibility calculations that have been carried out on all MSMEs, the average flexibility of MSMEs in P is 46.72%; in Q 47.05%; and in R District, 54.99%.

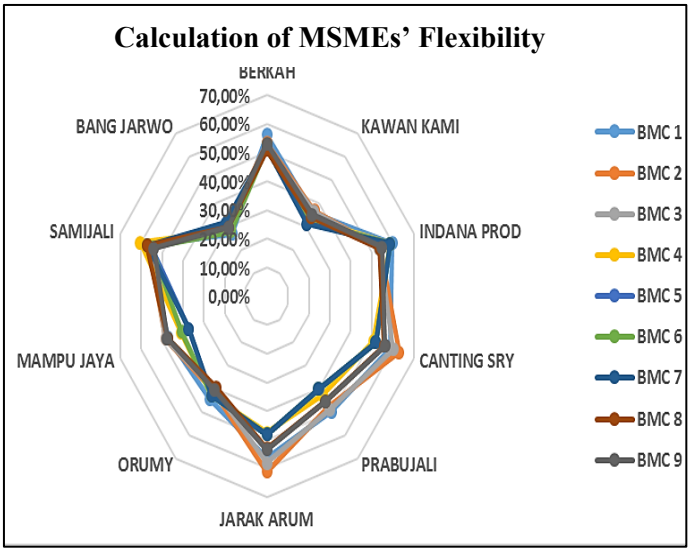

Figure 1 MSMEs' Flexibility in P

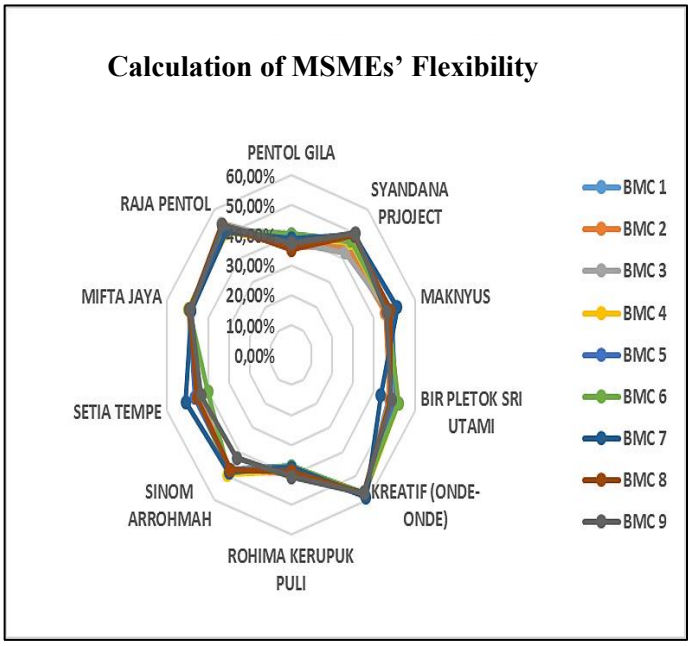

Figure 2 MSMEs' Flexibility in Q

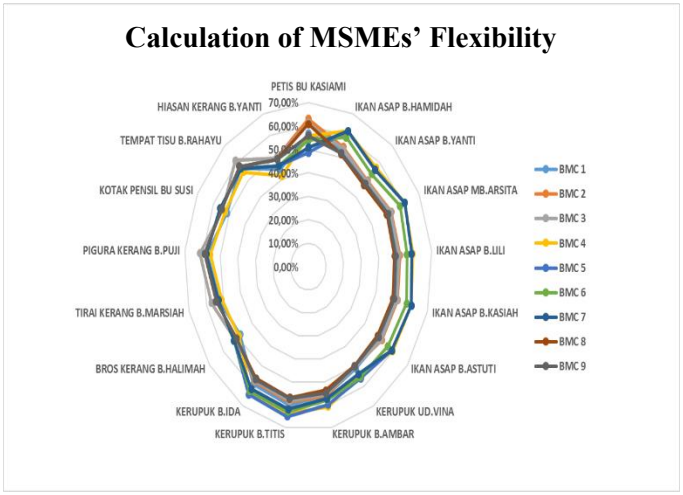

Figure 3 MSMEs' Flexibility in R District

3.2. Cluster System Design

Based on the results of calculations that have been done, cluster development is carried out according to the categories that have been determined. The typology of the clusters carried out is not limited by the location of the establishment of MSMEs, but is based on a network typology in which MSME players are based on reciprocity, trust and cooperative relationships.

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Table 1 Summary of Calculation of Flexibility Based on Cluster Category

MSMEs	Name	Flexibility Percentage	Cluster Category
MSME A	Bang Jarwo	29,24 %	Small Clusters
MSME B	Kawan Kami	34,01%	
MSME C	Pentol Gila	38,09%	
MSME D	Rohima	38,36%	
MSME E	Orumy	41,69%	
MSME F	Mmpu Jaya	43,78%	
MSME G	Prabujali	44,38%	
MSME H	Setia Tempe	44,87%	
MSME I	Hiasan Kerang B Yanti	46,81%	
MSME J	Syandana Project	46,81%	
MSME K	Maknyus	47,32%	
MSME L	Sinom Arrohmah	47,62%	
MSME M	Mifta Jaya	48,83%	
MSME N	Mir Pletok Sri Utami	48,97%	
MSME O	Bros Kerang B Halimah	51,12%	
MSME P	Ikan Asap B Yanti	51,68%	
MSME Q	Raja Pentol	52,27%	
MSME R	Kerupuk UD Vina	52,39%	
MSME S	Berkah	52,53%	
MSME T	Jarak Arum	52,71%	
MSME U	Tirai Kerang B Marsiah	53,72%	
MSME V	Ikan Asap B Lili	54,01%	
MSME W	Ikan Asap B Astuti	54,26%	
MSME X	Kotak Pensil B Susi	54,29%	
MSME Y	Ikan Asap B Kasiah	55,13%	
MSME Z	Ikan Asap Mb Arsita	55,18%	
MSME AA	Canting SRY	55,67%	
MSME BB	Petis B Kasiami	56,23%	
MSME CC	Samijali	56,44%	
MSME DD	Ikan Asap B Hamidah	56,71%	
MSME EE	Indana Prod	56,79%	
MSME FF	Kerupuk Bambar	56,88%	
MSME GG	Kreatif (Onde-onde)	57,38%	
MSME HH	Tempat Tisu B Rahayu	57,62%	
MSME II	Pigura Kerang B Puji	58,59%	
MSME JJ	Kerupuk B Ida	59,69%	
MSME KK	Kerupuk B Titis	60,54%	

Based on Table 1, MSMEs that have a flexibility value < 50% are categorized into the first cluster. While MSMEs that have a flexibility value > 50% are categorized into the second cluster. After

determining the cluster category, the next step is to form a cluster institutional system and the stakeholders involved. The institutional system is useful for supporting cluster systems to run sustainably. The cluster developed includes several related stakeholders, namely the core industry, supporting industries, professional associations, educational institutions, financial institutions, research institutions, and government agencies.

• Core Industry: MSME actors involved.
• Support industry: hotel industry, travel agency.
• Professional associations: groups or associations that include SMEs.
• Educational institutions: all state and private high schools in City A.
• Financial institutions: cooperatives, commercial banks (BRI, Bank Mandiri, Bank Jatim), cooperatives, and Bank Indonesia Corporate Social Responsibility (CSR).
• Research progress: Bank Indonesia Representative Office (KpwBI) Java Province Timuer, BPS, Technology Assessment and Application Agency (BPPT).
• Government agencies: City A Food and Agriculture Security Agency, City A Development Planning Agency (BAPPEKO), City A Trade and Industry Office, and City A Cooperatives and MSME Office.

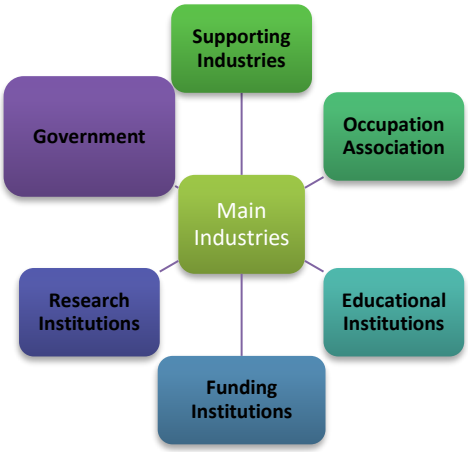

Figure 4 Cluster Institutional Model

4. Conclusion

The conclusions generated from this study are as follows:

1. The initial study of cluster development was carried out in three areas in City A, namely the former P brothel area, White Village, and R District.
2. Based on the results of the flexibility calculation, P's ex-lokalisasi area has an average flexibility rate of 46.72%; Q Village is 47.05%; and R Sub-district of 54.99%.
3. Every UMKM that has an average flexibility <50% is categorized into a small cluster category. MSMEs that have an average rate of flexibility> 50% are categorized into large cluster categories.
4. **Stakeholders involved in cluster development include core industries, supporting industries, professional associations, educational institutions, financing institutions, research institutions, and government agencies.**

5. References

[1] BPS Kota City A 2016 *Kota City A dalam Angka 2017*. (City A: Badan Pusat Statistik)
[2] Brown R 2000 Cluster Dynamics in Theory and Practice with Application to Scotland. *Regional and Industrial Policy Research Paper*, 1-30.
[3] Groover M 2008 *Automation, Production Systems, and Computer Integrated Manufacturing*. (New Jersey: Pearson Edcation Inc.)

ISSN: 1978-774X

[4] Hansen A 2003 September 16 Deve*loping a Cluster Based Economic Development Program of A Region.* Accessed: Septermber 26, 2017, from old.tci-network.org: http://old.tci-network.org/media/asset_publics/resources/000/000/184/original/prep-ahansen-application.pdf
[5] Hapsari, P. P., Hakim, A and Soeaidy S 2014 Pengaruh Perumbuhan Usaha Kecil Menengah (UKM) terhadap Pertumbuhan Ekonomi Daerah (Studi di Pemerintah Kota Batu). *Wacana*, 88-96.
[6] Herr and Muzira 2009 Value Chain Development for Decent Work: A Guide for Practitioners, Government, and Private Sector Initiatives. (Geneva: ILO Job Creation and Small Enterprise Development)
[7] Herr, M. L 2007 An Operational Guide to Local Value Chain Development. (Colombo: International Labour Organization)
[8] Hertog, P. D., Leyten, J., Limpens, I and Whalley, J. 1999 Approaches to Cluster Analysis and Its Rationale as A Basis of Policy. *RISE Project* 23.
[9] Karlson, A. 2008 Manufacturing System Design Based On Real-Life Demands- A Method Description. *International Design Conference*, 417-424.
[10] Kementerian Koperasi dan UKM 2007 Kajian Efektivitas Model Penumbuhan Klaster Bisnis UKM Berbasis Agribisnis. Jakarta: Deputi Bidang Pengkajian Sumber Daya UKMK Kementrian Koperasi dan UKM.
[11] Kementerian Koperasi dan UKM 2009-2010. Perkembangan Data Usaha Mikro, Kecil, Menengah (UMKM) dan Usaha Besar (UB). Jakarta.
[12] Kementerian Koperasi dan UKM 2010-2011. Perkembangan Data Usaha Mikro, Kecil, Menengah (UMKM) dan Usaha Besar (UB). Jakarta.
[13] Kementerian Koperasi dan UKM 2011-2012. Perkembangan Data Usaha Mikro, Kecil, Menengah (UMKM) dan Usaha Besar (UB). Jakarta.
[14] Kementerian Koperasi dan UKM 2012-2013. Perkembangan Data Usaha Mikro, Kecil, Menengah (UMKM) dan Usaha Besar (UB). Jakarta.
[15] Kementerian Perdagangan Republik Indonesia 2011 Penetapan Harga Patokan Ikan Untuk Penghitungan Pungutan Hasil Perikanan. Jakarta: Kementerian Perdagangan Republik Indonesia.
[16] Kementerian Riset Teknologi dan Perguruan Tinggi. 2017 Panduan Bantuan Pendanaan Perumusan dan Pendampingan Klaster Inovasi. Jakarta: Kemenristekdikti.
[17] Kemeterian Koperasi dan UKM. 2012. Undang-Undang republik Indonesia Nomor 17 Tahun 2012 Tentang Perkoperasian. Jakarta.
[18] Nash, M. A., and Poling, S. R. 1959 Mapping The Total Value Stream: a comprehensive guide for production and transactional process. (New York: CRC Press)
[19] OECD 2004 Promoting Entrepreneurship and Innovative SMEs in A Global Economy. *2th OECD Conference of Minister Responsible for SMEs*, 1-78.
[20] Osterwalder A and Pigneur Y 2010 Business Model Generation. (United States: John Willey & Sons, Inc.)
[21] Partiwi, S. G. 2007 Perancangan Model Pengukuran Kinerja Komprehensif pada Sistem Klaster Agroindustri Hasil Laut. Bogor: Institut Pertanian Bogor.
[22] Pemerintah Kota City A. 2007 Peraturan Daerah Kota City A Nomor 6 Tahun 2007 Tentang Usaha Perikanan dan Usaha Kelautan. City A: JDIH.
[23] Pemerintah Kota City A. 2010 Peraturan Daerah Kota City A Nomor 1 Tahun 2010 Tentang Penyelenggaraan Usaha di Bidang Perdagangan dan Perindustrian. City A: JDIH .
[24] Pemerintah Kota City A. 2015 Rencana Pembangunan Jangka Menengah Daerah (RPJMD) Kota City A 2016-2021. City A: Pemkot City A.
[25] Pemerintah Kota City A. 2017 Laporan Kinerja Pemerintah Kota City A Tahun 2016. (City A: Pemkot City A)
[26] Porter, M. E 1990. The Competitive Advantage of Nations. (New York: The Free Press)

[27] Prasetyawan, Y., Maulida , N., and Lutvitasari, M. 2017 The Integration between Business Model Canvas and Manufacturing System Design. IconISE.