



# Network Management Strategy in Strengthening Small and Medium-Sized Enterprise Clusters: A Case Study in Indonesia

Daryono<sup>a</sup>, Viyouth Chamruspanth<sup>b</sup>, Achmad Nurmandi<sup>c</sup>, <sup>a,b</sup>Public Administration Department, Faculty of Humanities and Social Sciences, Khon Kaen University, Khon Kaen, Thailand, <sup>c</sup>Department of Government Affairs and Administration, Jusuf Kalla School of Government, University Muhammadiyah Yogyakarta, Yogyakarta, Indonesia, Email: [daryono.d@kkumail.com](mailto:daryono.d@kkumail.com), [viyucha@kku.ac.th](mailto:viyucha@kku.ac.th), [nurmandi\\_achmad@umy.ac.id](mailto:nurmandi_achmad@umy.ac.id)

This research investigates the actors that have considerable influence upon network management, and the implementation network of management strategy in strengthening small and medium-sized enterprise (SME) clusters. The study took place in the cities of Samarinda, Balikpapan, and Bontang. The three categories of clusters which were found in these areas were batik, food, and handicraft. The number of samples chosen within the cluster sampling design was 303 respondents. A social network analysis was implemented to analyse the data. This research found that the actors with a dominant influence were indicated by a high centrality value. The actors were the Province industry, cooperative, and SMEs Department; the District Industry Department; the technical and vocational education and training centres; the District Tourism Department; the Province Social Department, and the local government technical institution. Later, efforts to strengthen the networks of the SME clusters were determined by three factors, which were actor diversity, centrality diversity, and the target of the network strengthening program.

**Keywords:** *SME cluster, Social network analysis, Network management.*

## Introduction

Small and medium-sized enterprises (SMEs) provide a large contribution, including, among others increasing the number of enterprises, employment generation, and the gross domestic product (GDP) within a country (Tambunan, 2011). Furthermore, Narain et al. (2003) stated that the SMEs comprise approximately 90 per cent of all enterprises and contribute to job opportunities in the private sector, at a rate of more than 60 per cent; generate 50–80 per cent of total employment; contributes approximately 50 per cent of all sales; and contributes 30 per cent of all export. Generally, the SME development process is made possible through various methods, and strategies. The benefits of an SME cluster includes reducing transportation and transaction costs, and increasing efficiency (Choirul Djahhari, 2006) for the strengthening of SMEs' competitiveness. Moreover, industrial clustering can be one solution (Dipta, 2010). Through the clustering policy, SME competitiveness is employed increasingly to gain a new market share and expand networks. The cluster system is one approach to developing SMEs, and it has had a significant impact on global SME development.

The SME development process faces many obstacles. According to Fauzi (2018), the problems encountered in the Sarong Samarinda cluster development include: capital, raw material, human resource, access to markets, and technological constraints. Furthermore, Nainggolan (2015) explained that the problems in the SME development are due to the limited role of the SME Department. Consequently, in this context, guidance in assisting and developing SMEs was not progressing well. Another obstacle is that the SMEs' have weaknesses in coordination among the many parties involved, and the necessity to increase capital funding for the system. Recently, policy interest in SME clusters in Indonesia has grown considerably, promoted by the Ministry of Industry and Trade, and the Ministry of Cooperative and SMEs Development (Henry Sandee, Brahmantio Isdijoso, 2002).

Tambunan, T (2005) revealed that government effort is necessary to eliminate the institutional barriers. For instance, development programs, security standard improvement, and proper financing policies. Most Indonesian industrial clusters have grown spontaneously from community economic activities (Mawardi, Choi, & Perera, 2011). Referring to the network management, this research focusses on several fundamental problems that have a connection with the network management strategy in strengthening a SME cluster. Therefore, discussion within this study is limited to the development of a network.

## Theoretical Review

There are three fundamental concepts of an industrial cluster, namely commonality, concentration, and connectivity (Lyon & Atherton, 2000). Commonality refers to business

people who have similar businesses, and concentration refers to an area of a grouping of businesses. Connectivity refers to organisations that are interconnected with a variety of different relationships. Another scholar defines a cluster as a group of objects that have similar characteristics and indicators.

To understand the concept of the cluster, there are several opinions from experts regarding the cluster system scope. In the opinion of, a cluster has the literal sense as a collection, unity, or a combination of certain objects, which have a similarity on the basis of certain characteristics. In the context of the business, it is an 'industry cluster'. Other opinions that have relevance to the definition are given by Munnich Jr, Schrock, and Cook (2002), who state that the cluster system is the geographic concentration of industries competing, complementary or interdependent, and doing business with each other, and whom have similar needs, abilities, technology, and infrastructure.

Another opinion is delivered by, who states that an industry cluster is a collection of a variety of different economic actors, interacting and cooperating with each other, who are bound by a social network. In line with this Morosini (2004) refers to it as 'social glue'. Dayasindhu (2002) revealed that the things that make these interactions continue to this day are their social closeness or a close-knit social relationship. The shape builds the trust among economic actors, and they socialise in the cluster. In connection with the trust factor, Marijan (2005) explains that in establishing the SMEs into a cluster, the trust factor must be established. Thus, essentially an element of trust can be combined with the mutual cooperation concept in establishing the intensity of interaction and cooperation in clusters. Dipta I.W (2015) explains that mutual cooperation is needed to build 'social networks' in the SME clusters. Michael Porter explains that the factors that build the spirit of innovation, and encourage the growth of clusters are, as follows: (Niskha Sandriana, 2015) condition factors, requests of a domestic sector or local customers, supporting related industries and strategy, and structure and competition.

Referring to the above concept, Dipta, I.W (2005) explains that the business associations' development of a SME cluster will be able to form a synergy in the allocation of resources through clusters being created, and enhanced coaching, effectively facilitating technology transfer and dissemination of information to SMEs. If the SME business networks can be developed, it will improve the competitiveness.

From the description above, the following can be concluded: the definition of a 'SME cluster' is a group of SMEs that fulfil specific requirements among others; 'commonality' refers to SMEs' similarities in products; 'concentration' notes there is a grouping of businesses that interact with one another and are centralised in one area; and 'connectivity' refers to business organisations that are interconnected with one another.



Regarding an industrial cluster policy, this can be carried out by coordinating industry development efforts among local governments, and by providing information to firms that could benefit from locating or participating in an industry cluster (Thomas Lambert, 2016), leading to the entrepreneurs' role in cluster success (Feldman, Francis, & Bercovitz, 2005). The different phases of industrial clusters have an impact on the various policy interventions that should be set by the Government (Sabatier, 1999). In sum, industrial clustering policy involves firms, and some specific supporting institutions being interconnected with each other.

The first stage of a SME clustering policy is establishing regulation, a governance system, and standard operating procedures. When each stakeholder has achieved understanding, they will make their contribution wholeheartedly (Nurmandi, Muallidin, Priyo Purnomo, & Suryanto, 2016). In other words, businesses trust one another. Therefore, cooperation among business actors should be taken more seriously in order for SMEs to achieve innovation, and define the ability of the SME to innovate its ability to choose “ever-changing environment-responsive strategies and actions to achieve corporate goals” (Lee, Shin, & Park, 2012). The services and facilities would be very costly for the providers, if delivered to individual enterprises in dispersed locations. In sum, the economic performance of an industry cluster is the outcome of a complex process of playing the economic game according to formal and informal rules, which provide incentive structures, and channel innovative activities in a certain direction (North, 2016). Clusters may not simply reduce the cost of production, but also the cost of exchange, by enhancing trading relationships and the transparency of local input and output markets (Mercedes Delgado, Michael E. Porter, 2012).

Organisational development of the private sector, especially SME clusters, could be achieved through a network management strategy. The strengthening of the network management of SME clusters can be determined by two factors: actor, and centrality diversity. The diversity of actors consists of the government institutions at the provincial level, the local government institution, the supporting institutions, and representative of the business actors. Meanwhile, the centrality diversity comprises the degree, closeness, betweenness, and eigenvector centrality.

### **Research Method**

The determination of the research location preference was based on the existence of SME clusters, and a business that has a strong relationship with home industries. Selective sampling is often pursued in qualitative inquiry, as a practical approach (Schatzman & Strauss, 1973), and “refers to a decision made prior to beginning a study to sample subjects according to a preconceived, but reasonable initial set of criteria” (Sandelowski, Holdditch-

Davis, & Harris, 1992: 302). According to Suafa Badi (2017), the sample size at SMEs can be determined based on three categories: ownership, size of SMEs, and time of operation. Based on these theories, this research was conducted in three regions, and in three SME cluster categories: batik, food and handicraft. The sample criteria including having a minimum of three employees, and no more than 100 people, being members of a joint business group, and being part of the cluster system. Three hundred and three respondents were selected to be sampled by using a cluster sampling design. The data collection was carried out using a full structure questionnaire and was measured on an ordinal scale through five answer levels.

The data analysis was performed by using a social network analysis (SNA). The relations among the actors will describe the interaction model built on social networks and are able to recognise the actors which have an important role in the network. Through social ties, people gain access to information and support (Agusyanto, 2014). Through a SNA, it is possible to identify actors who play a central role (Serrat, 2017), and we are able to identify actors who have the highest number of established interactions (Setatama et al., 2017). The SNA implements several metrics, such as the degree of centrality, betweenness centrality, and reciprocity (Iriani & Priyanto, 2013). The SNA applies several indicators, including, among others: density, centrality, diameter, and average distance. Moreover, Otte et al. (2002) revealed that when investigating social structures, collaboration structures, and other forms of social interaction networks, it is appropriate to use a SNA. An SNA includes a set of measures that enable a qualitative examination and quantitative analysis of the relationships among actors (Wasserman & Faust, 1994). Generally, an SNA is based on the three networks, including, among others: density, tie strength, and degree of centrality (Sula Badi et al., 2017). Furthermore, the SNA provided an overview of the network's centrality in terms of degree, betweenness, and closeness of centrality metrics (Jovita H. D. et al., 2018). Nevertheless, this research implemented one measurement only of a SNA, being the centrality approach.

## **Research Finding and Discussion**

This section discusses the performance of network management, and that substance explains the interaction of actors. There were 18 actors, consisting of government institutions, business people representatives, supporting institutions, and other institutions. The data presentation was completed by displaying tables, and figures, and was narrated through a centrality approach. The purpose was to describe the performance of the SME cluster network through the interaction quality of the actors, and to determine the influential actors.

### *Description of Network Management Performance at the Province Level*

The performance of the SME cluster network management is assessed by all respondents, and the item assessed is the actors' role. Subsequently, these scores were analysed through a SNA, with the focus on the centrality. The role of the actor in the network is also described in detail, as shown in the following table:

**Table 1:** The role of actors in the network

No	Actor	In Degree	Out Degree	Closeness Centralit y	Betweenness Centrality	Eigen Centralit y
1	RDPA	17	30	0.54	486,423	0.94
2	PITCSD	17	38	0.56	2,974,166	0.83
3	PTA	17	28	0.54	225,473	0.95
4	PSD	17	31	0.55	429,911	0.98
5	DCSD	17	38	0.56	3,052,166	0.83
6	DITD	17	37	0.56	2,879	0.81
7	DTD	17	38	0.56	2,240,228	0.88
8	DDPA	17	32	0.55	484,113,342	0.98
9	Association	17	34	0.55	1,219,239	0.89
10	JVL	17	32	0.55	472,941	0.51
11	LGTI	17	35	0.55	2,119,583	0.83
12	TVETC	17	34	0.55	864,230	0.99
13	IB	17	36	0.56	1,835,809	0.91
14	ISB	17	32	0.55	495,950	0.97
15	PBI	17	34	0.55	1,165,851	0.96
16	MB	17	31	0.55	719,343	0.96
17	LB	17	32	0.55	83,000	0.98
18	OI	17	31	0.55	421,558	0.97

**Sources:** SNA Analysis

Based on the above table, it will be discussed which institutions have an important role in the interaction of network development. The discussion and conclusions are based on certain indicators, including: indegree, outdegree, closeness, betweenness, and eigenvector centrality.

#### *Indegree centrality*

The term 'indegree centrality' refers to the substance of indegree to measure how strong an actor can attract or pull relationships into him, making other institutions interested in making connections, establishing communication, and engaging cooperatively with other institutions.



With reference to the above table, it can be understood that the value of indegree of each actor that has the same level is 17, which indicates that the degree or level of ability of each actor, in its attempt to attract into the relationship, is equal. This means that each actor has the same power, strength, and authority in their efforts to strengthen network management in the SME clusters.

#### *Outdegree centrality*

The value of outdegree centrality consist of four actors that have a high value, including PITCSD, DCSD, and DTD; each node has 38 points, and the DTID has 37 points.

#### *Closeness centrality*

Referring to the data above, it can be explained that there are five institutions that have a high centrality, including PITCSD, DCSD, DTD, DTID, and the Indonesia Bank. The fifth institution has 0.56 points. The high value of the centrality is related to a high frequency of meetings with business people, the continuity of the program, and the seriousness in cluster development.

#### *Betweenness centrality*

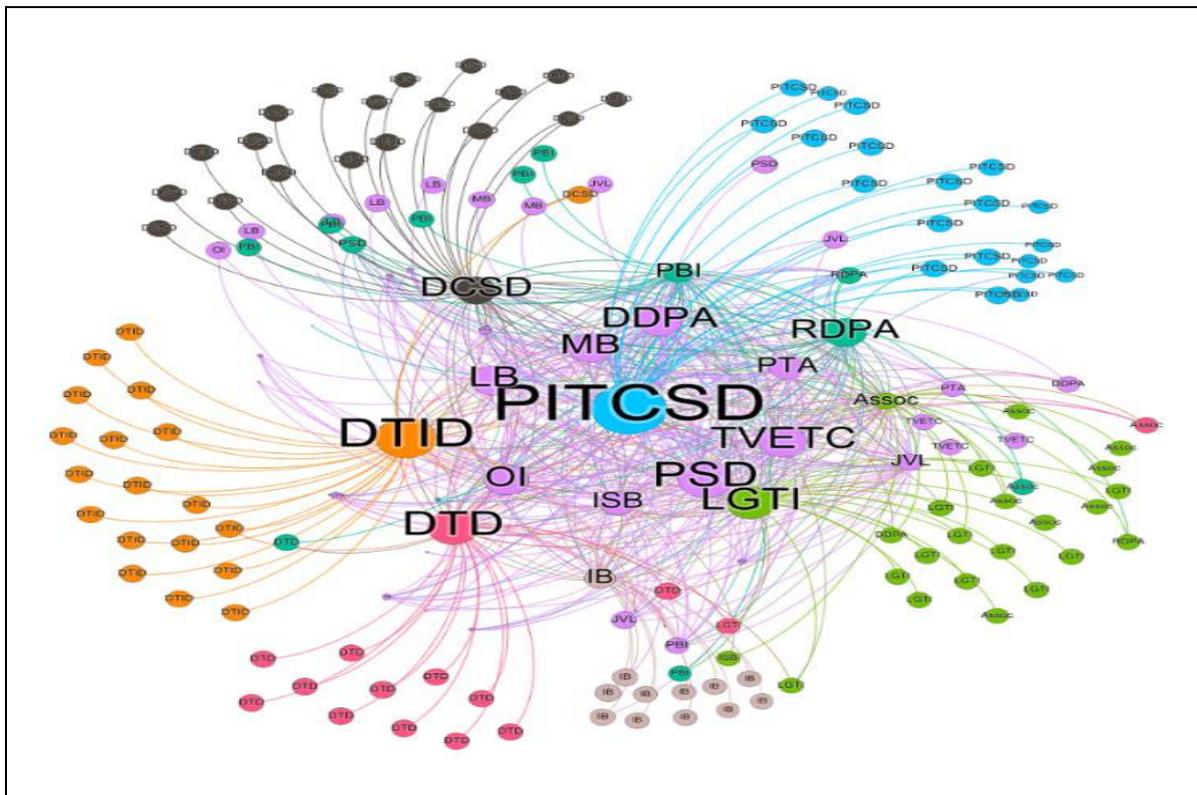
The data in Table 1 shows that there are four institutions that have the highest bottleneck point, and they are DCSD, PITCSD, DTD, and LGTI. The four institutions can bridge between the fourteen other institutions in the process of strengthening networks in the SME cluster.

#### *Eigenvector centrality*

There are three institutions that have a high eigenvalue, which are: TVETC at 0.99, PSD at 0.98, and DDPA 0.98. This can be explained due to the four institutions being eligible to receive a high score associated with the eigenvector centrality.

Based on the research findings, this data was then visualised through a graph of the SNA, as shown below:

**Figure 1.** Visualisation the role of actor in SMEs Cluster



Based on the visualisation, the PITCSD is the central actor. This actor is able to establish communication and reach the majority of actors in the network. The existence of the PITCSD was supported by the presence of the DTID, and DCSD. Other actors which have a significant role consist of the DTD, TVETC, PSD, PTA, and the local bank. These actors interact with SME cluster business people in strengthening the network.

### ***Network Management Performance at the District Level Samarinda***

Samarinda City consisted of the sarong Samarinda, amplang, ketupat, and handicraft cluster. The instrumental actors in the sarong Samarinda cluster were categorised into two. Firstly, degree centrality, which consists of the DTID, and LGTI. Secondly, betweenness centrality, which consists of the TVETC, DTID, LGTI, and JVL. From these two centrality items, it can be concluded that the interactions in this cluster were dominated by several actors, which were the DTID, TVETC, LGTI, and JVL. Based on this set of indicators, the actors who bridge the communication in the sarong Samarinda cluster were the TVETC, DTID, LGTI, and JVL. Furthermore, the DTID, and LGTI acted as actors with dual roles, indicating that the two actors can be both a bridge of communication and actors of degree centrality, where they can attract a relationship with other actors, as well as

distributing the power they possess to them. Therefore, these actors were seen to have a highly influential role in strengthening the network management.

From those explanations, there were several key actors in strengthening the SME cluster network in Samarinda: the DTID, LGTI, TVETC, JVL, PITCSD, local bank, RDPA, DTD, PSD, association, and the DDPA.

The PITCSD had a significant contribution in developing the SME clusters. Their contributions, among others, included accommodating SME interests, which require support in the form of policies, opening access, and promoting products. This agency assisted managing the existence of business organisations and strengthened the business networks through establishing the cooperatives, and the LGTI. Furthermore, on the role of the DTID, the business actors of the SME clusters in Samarinda considered that this institution was most concerned in fostering the SME clusters.

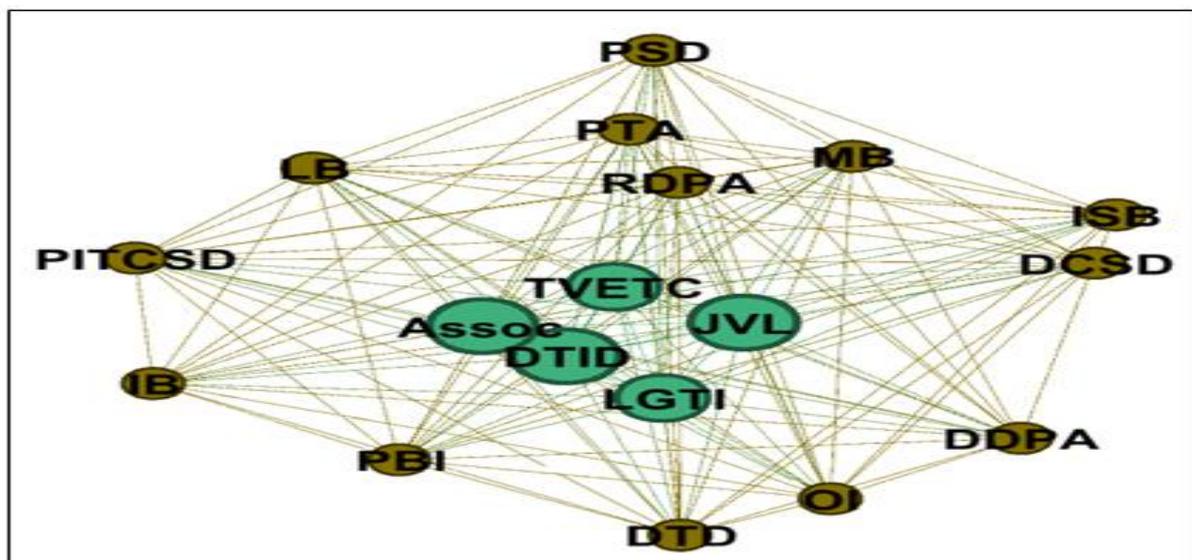
The local government, through the DTD, has been working to develop the tourism sector by launching the Tourism Awareness Program. This program invites various travel agencies, and SMEs to be involved in developing tourist destinations. The Tourism Awareness Program is considered to contribute to the progress of the SMEs clusters, especially the sarong, ketupat, and amplang clusters. As for developing the ketupat cluster, this program is integrated with the policy of the Government in the form of promoting '*Kampung Ketupat*' tourism destinations. Thus, the development of tourist destinations, which are specifically handled by the Tourism Department, are expected to have a positive influence in strengthening the SME cluster network.

This research found that several influential actors had more specific roles in strengthening the networks, as seen from their contributions to achieve 17 out of 20 targeted points in strengthening the networks of this SME cluster. In detail, the intended targets were a business plan, business management, arrangement and development of human resource quality, providing the business with direction, business management reporting processes, providing economic capital assistance, providing access and information for developing business capital, providing training on product knowledge, providing training on packaging knowledge, providing training on marketing knowledge, providing consulting services to increase the number of customers, providing communication and interaction in discussing and determining business development strategies, doing communication in discussing the various problems in business, providing initiatives for technical solutions, providing important information in business development, providing business assistance, and providing technological support.

To conclude the explanation on the SME clusters in Samarinda, most actors involved in these clusters only focussed on the betweenness centrality. Meanwhile, the actors lacked effort in developing the potential of degree, closeness, and eigenvector centrality. However, it is important to develop the centrality pattern through four existing centrality paths, in order to strengthen the network performance. Since the actors in this cluster only focussed on betweenness centrality, their role was merely limited to being a bridge of communication, and was lacking in creating ideas, policies, and other areas of creativity. There are two realities that could be used as evidence to prove that the SME clusters in Samarinda are below expectations. Firstly, of all the seventeen actors that were presented in the cluster, only eleven were capable of actively contributing to strengthening the SME clusters network. Secondly, several actors in these institutions were able to contribute significantly, achieving 17 points out of 20 targeted points in strengthening the networks.

With reference to those mentioned realities, problems, and the descriptions of network management, a suggested solution is to empower the potential of eleven actors to collaborate in compiling work programs. Work programs must consider three requirements of clusters: commonality, concentration, and connectivity. To have a better understanding of the explanations, Figures 2, 3, 4, and 5 illustrate each case of the clusters.

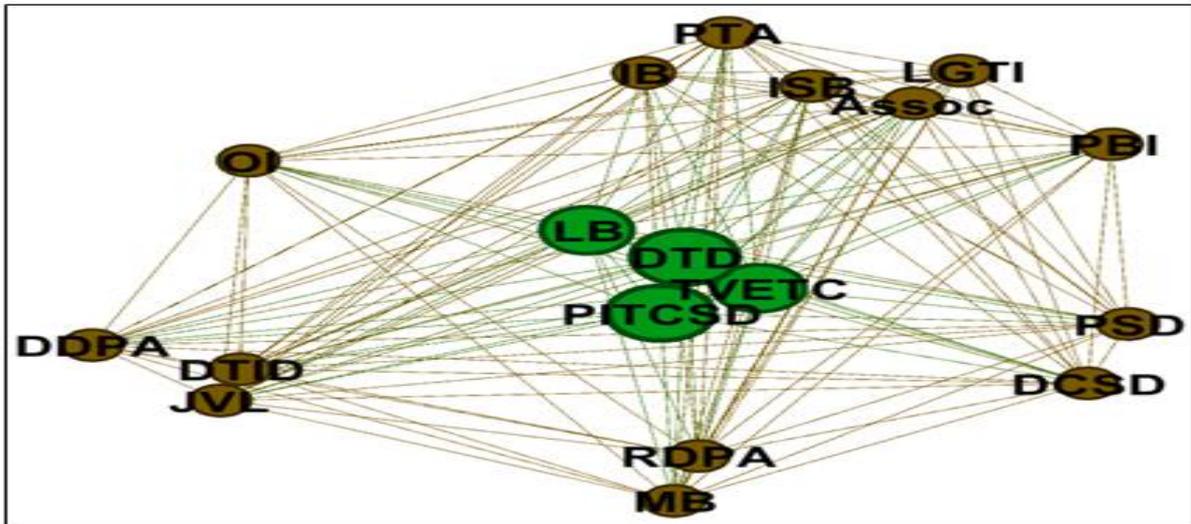
**Figure 2.** Sarong Samarinda Cluster



The interactions in the sarong Samarinda cluster are dominated by four main actors, and one supporting actor. The main actors are the DTID, TVETC, LGTI, and JVL, while the supporting actor is the association. These actors are facilitated through degree, and betweenness centrality. One of the roles of these actors is to influence other actors by attracting and encouraging them to actively participate in developing the cluster, and

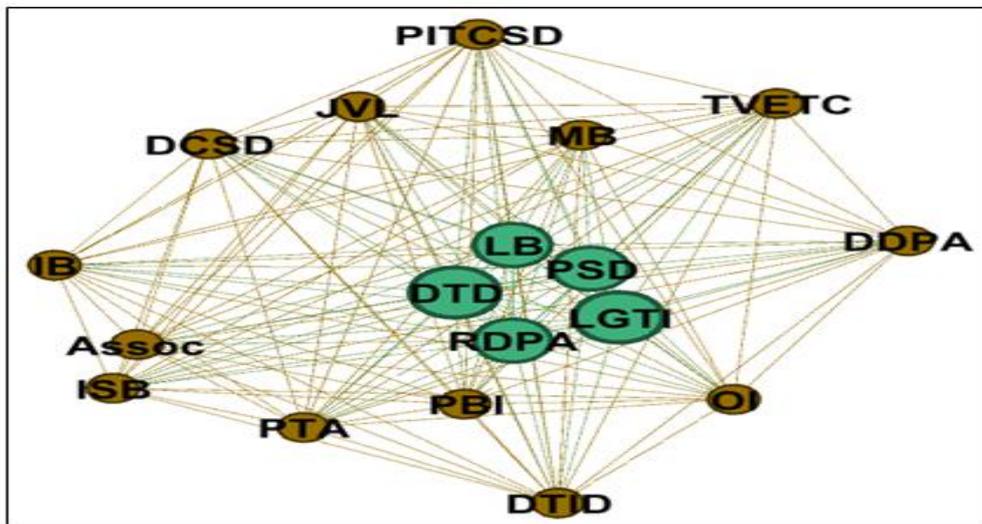
transferring ideas and suggestions to the other actors. Furthermore, these actors are expected to function as a bottleneck.

**Figure 3.** Amplang Cluster



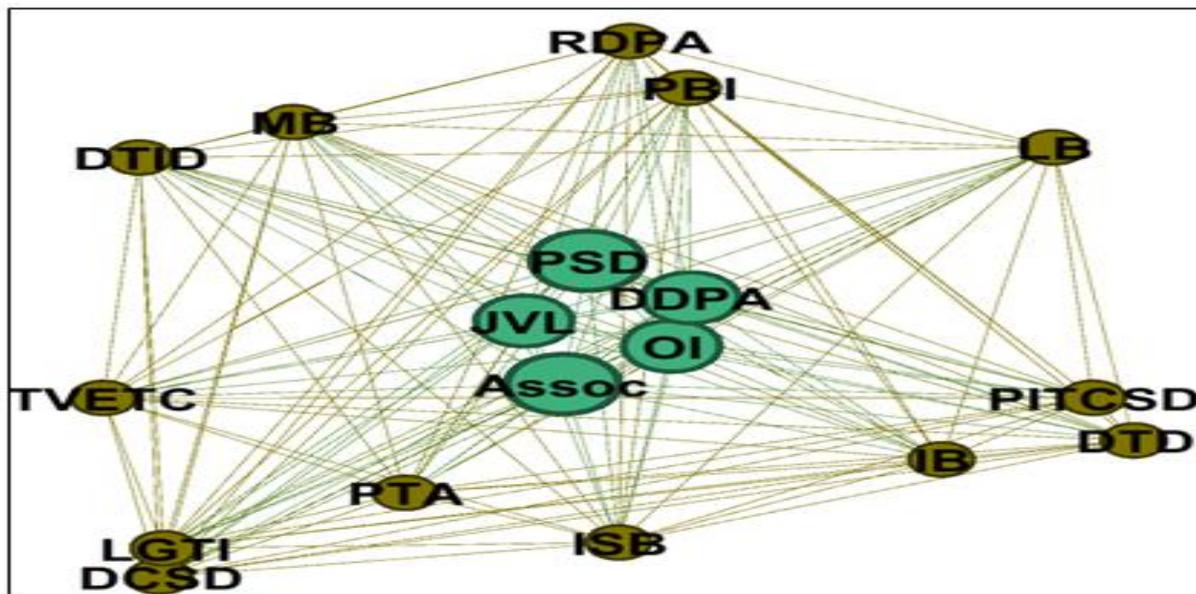
The amplang cluster has existed longer than the other clusters. However, its development has been slower than the others. With respect to the network performance, the interaction of the actors in this cluster was minimal; only one actor was seen to have actively been involved, which was the PITCSD. It acted in degree, closeness, and betweenness centrality. That means that the PITCSD has a close connection to all actors in the network, and acts as a bottleneck in bridging the communication among actors in the cluster. To maximise its role in the amplang cluster, this institution is supported by the LB, DTD, and TVETC. Therefore, the PITCSD acted more as a leader in combining the various work programs of the other actors.

**Figure 4.** Ketupat Cluster



The actors that have an important role in the ketupat cluster are the LB, RDPA, DTD, LGTI, and PSD. These five actors have a role in closeness, betweenness, and eigenvector centrality. The weakness of the network in these clusters is that there is no actor that has a role for degree centrality. It is difficult for these actors to build cooperation with other actors to develop networks.

**Figure 5.** Samarinda Handicraft Cluster



This cluster was dominated by actors that lack authority in a strong relationship with SME clusters. For instance, the DDPA, and PSD. Nevertheless, two actors have contributed to strengthening the network through betweenness centrality, namely the association, and JVL. Referring to the network quality conditions, there are two weaknesses. Firstly, the lack of roles for the main actors in the cluster. Secondly, the absence of actors who contribute to degree, and closeness centrality. Thus, the work program of these actors runs partially, without collaboration among the actors in the cluster development.

### ***Balikpapan***

The network development of SMEs in Balikpapan reflected the active role of the local and provincial governments. The dominance role was carried out by the Trade and Industry Department (DTID). The DTID was able to play an active role in betweenness, and eigenvector centrality because it acted as a bottleneck for institutions that could not interact with certain institutions. Subsequently, the DTID connected two different actors that have important roles, which were to collaborate, build, and strengthen the networks.

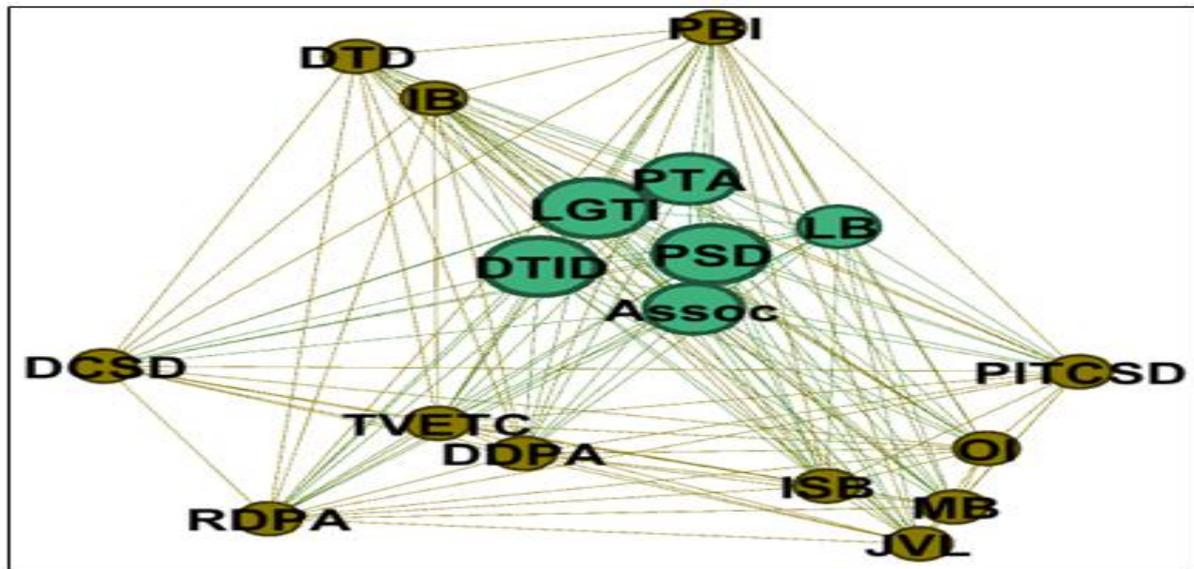


Furthermore, the association role in the SMEs is to provide a strategy for confronting the market. Since global competition is a reality, it is almost impossible to separate the domestic market from the international market. When considering that, the existence of the association is crucial in establishing communication with the Government and stakeholders, as an effort to get support from the Government regarding policies on business protection, and market penetration. Although its roles can be categorised into several aspects, its priority aspects are management, marketing, and information. By giving priority to these three aspects, this institution can contribute to strengthening the SME clusters' management network. Accelerating the SMEs development was done through a collaboration between the association with the Tourism Department. For instance, combining tourism promotional packages with tours to industrial centres in Balikpapan.

This research found that besides the above-mentioned contributions, some actors had more specific roles in strengthening the networks, as seen from their contributions in achieving 18 out of 20 targeted points in strengthening the networks. In detail, the intended targets were business plan, business management, arrangement and development of human resource quality, business reporting management processes, providing economic capital assistance, providing access and information to develop business capital, providing assistance for raw material supply, providing access to raw material supply, providing training on product knowledge, providing training on packaging knowledge, providing training on marketing knowledge, providing training on finance knowledge, providing communication and interaction in discussing and determining business development strategies, providing communication in discussing various problems in business, providing initiatives for technical solutions, providing important information for business development, providing business assistance, and providing technological support in running the business.

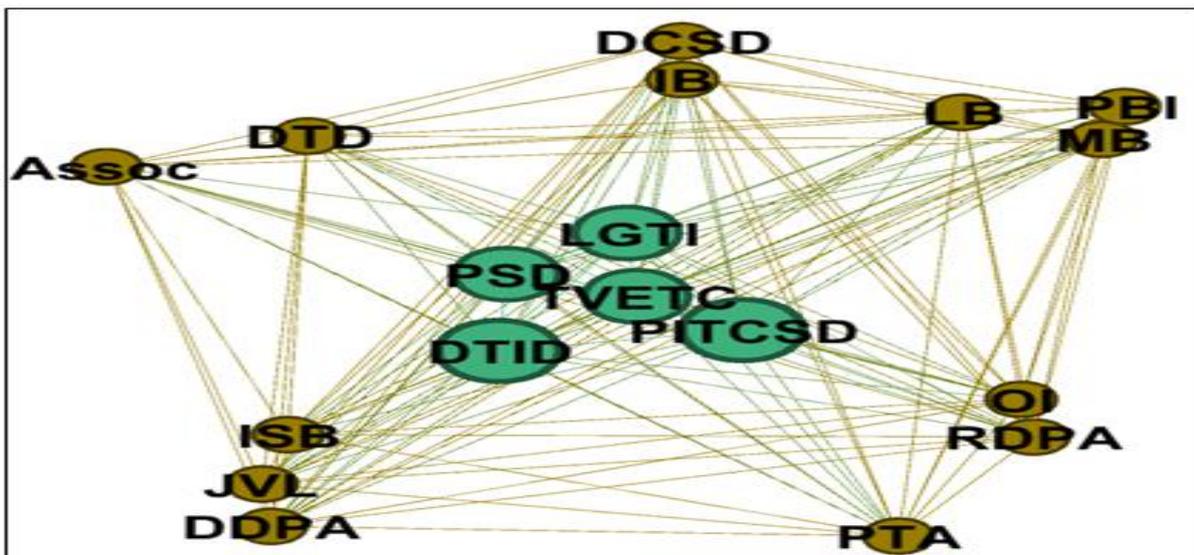
To conclude, the number of actors with active roles in the SME clusters in Balikpapan was 11 institutions from the provincial government, and local government, as well as the LB, PTA, association, LGTI, DTID, PSD, TVETC, PITCSD, DTD, DCSD, and JVL. Generally, those actors contributed by strengthening the SME clusters network, where their roles were fairly distributed in the three paths of centrality, which are closeness, betweenness, and eigenvector centrality. Furthermore, some of the actors also provided specific contributions in strengthening the network, where they achieved 18 out of the 20 targeted points. This condition strongly influenced the performance of the SME cluster networks, thus influencing the existence of the SME clusters in Balikpapan. Overall, based on the measuring indicators — which were value and diversity of centrality, actors, and strengthening targets of cluster network — the network management of clusters in Balikpapan was better than the other areas, as seen in figures below:

**Figure 6.** Balikpapan Batik Cluster



The Balikpapan batik cluster network consisted of a combination of various interactions between actors, and centrality. There were three groups of institutions in this network, specifically, the government, association, and supporting institutions. This variety of actors was strengthened by the centrality path in the network, which was closeness, betweenness, and eigenvector centrality. The integration between the various actors, and various types of centrality was able to strengthen the performance of the networks.

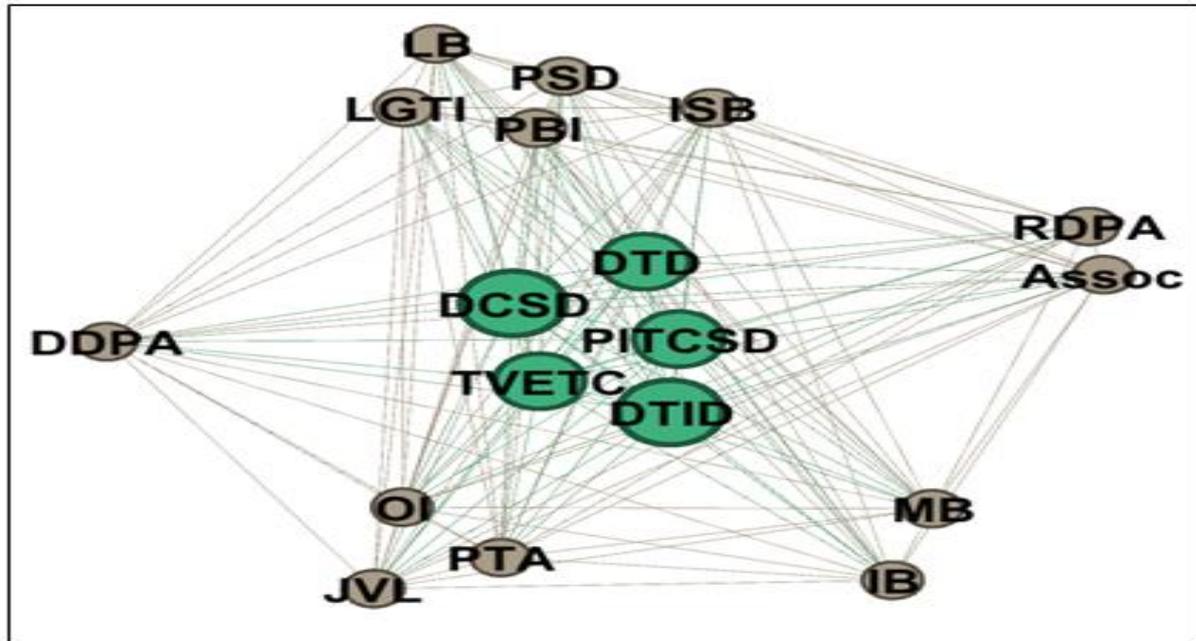
**Figure 7.** Tofu Tempeh Cluster



The tofu tempe cluster network was strengthened by the combination of provincial institutions, and the local government of Balikpapan. Most of the SME clusters had a good performance due to the Government's support. The TVETC became a central actor through

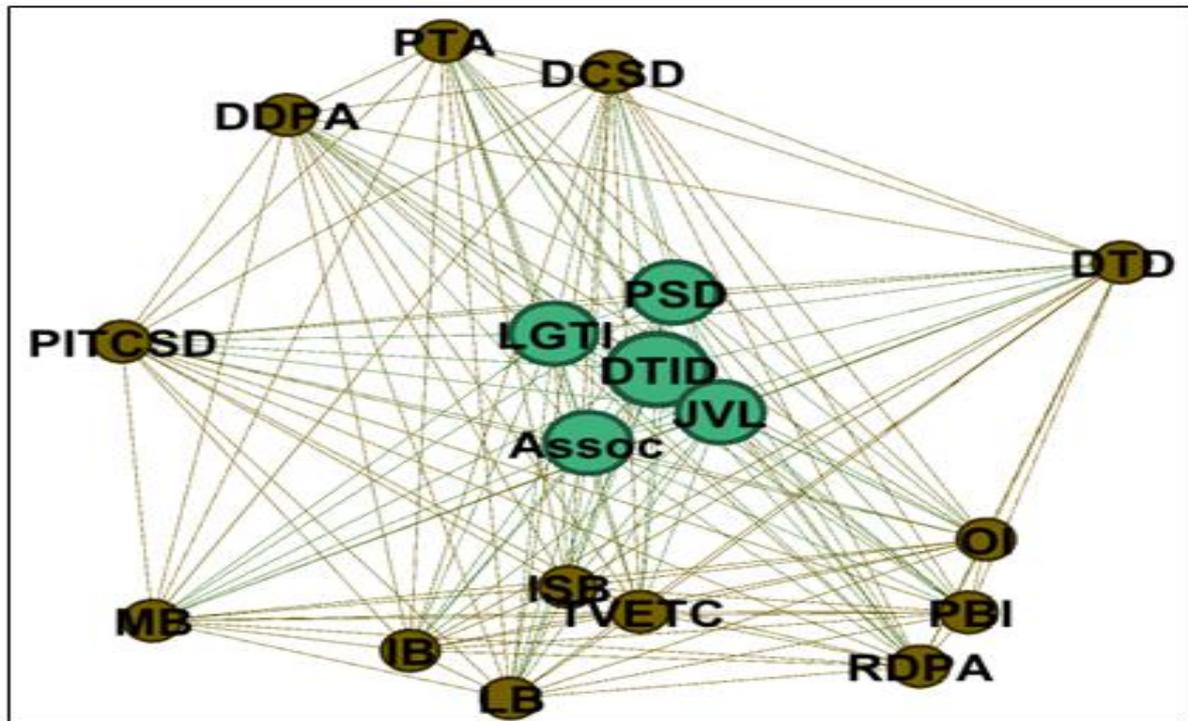
its active role in closeness, and betweenness centrality. This role was also strengthened by the LGTI, and three other actors, which were the PITCSD, PSD, and DTID, enabling their performance to meet expectations.

**Figure 8.** Crub Cluster



The crub cluster network received serious attention from the local government, namely the TVETC, DTD, PITCSD, DCS, and DTID. A majority of actors were able to integrate their work programs to develop the crub clusters, especially strengthening the networks. The work program integration process was possible because the dominant actor was able to undertake a role in closeness, betweenness, and eigenvector centrality.

**Figure 9.** Balikpapan Handicraft Cluster



The networks in the handicraft cluster have a combined network structure. The technical activities are dominated by the LGTI, and JVL. Generally, the cluster development policy was supported by the Balikpapan Industry Department. However, to strengthen the inter-regional networks, it was supported by the PSD. The influential actors were integrated in closeness, betweenness, and eigenvector centrality.

### ***Bontang***

Bontang consisted of two kinds of clusters: the seaweed, and the handicraft clusters. The five actors that supported the seaweed cluster were the DCSD, TVETC, JVL, RDPA, and DTID. The actors' roles were through the three centrality paths of closeness, betweenness, and eigenvector centrality. The network in the seaweed cluster was dominated by the interaction of actors from the local government. Therefore, the pattern of ideas and creativity development in this cluster was from the government institution to the business actors. Generally, the network management was well ordered, thus it could be used to encourage the strengthening process of this cluster. This cluster was supported by five actors, which were the LB, PTA, LGTI, DTID, and DDPA. This network's cluster had a weakness in its market access outside of its region due to the lack of support from actors of the provincial government. Although there was only one provincial institution participating in this cluster development, its role was only limited to product promotion conducted by the Provincial

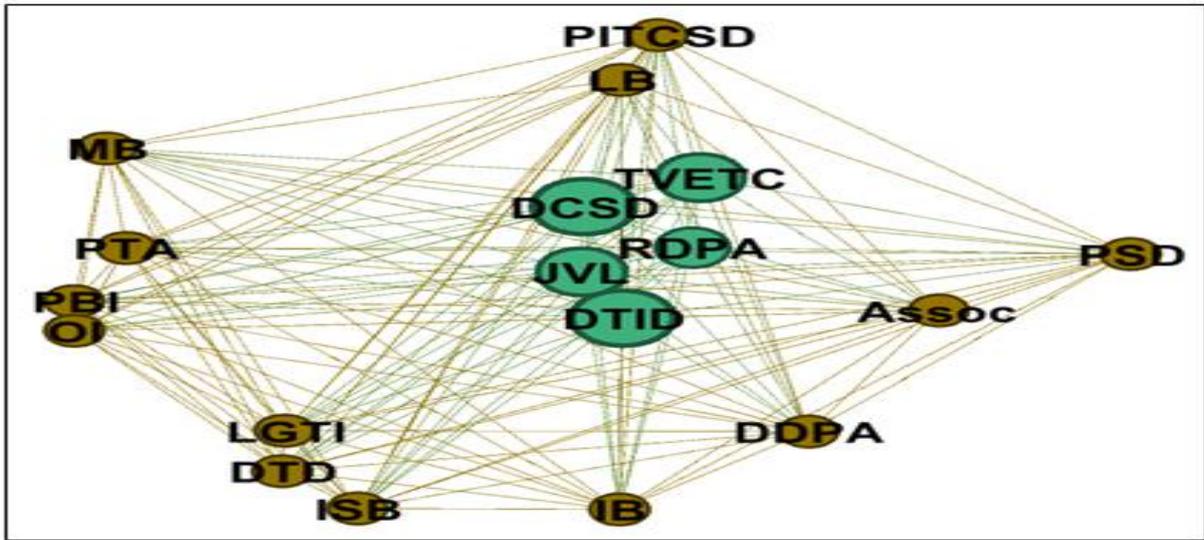


Tourism Department. Generally, the network management in the handicraft cluster showed a good performance.

In particular, this research found that there were two actors who had a significant role in strengthening the network management, namely the DTID, and DTD. These actors were able to achieve 16 points from 20 in the network management strengthening program. In detail, the intended targets were a business plan, business management, arrangement and development of human resource quality, providing the business direction, business reporting management processes, providing training on product knowledge, providing training on packaging knowledge, providing training on marketing knowledge, providing training on finance knowledge, providing consulting services to increase the number of customers, providing communication and interaction in discussing and determining business development strategies, providing communication in discussing various problems in business, providing initiatives for technical solutions, providing important information for business development, providing business assistance, and providing technological support in running the business.

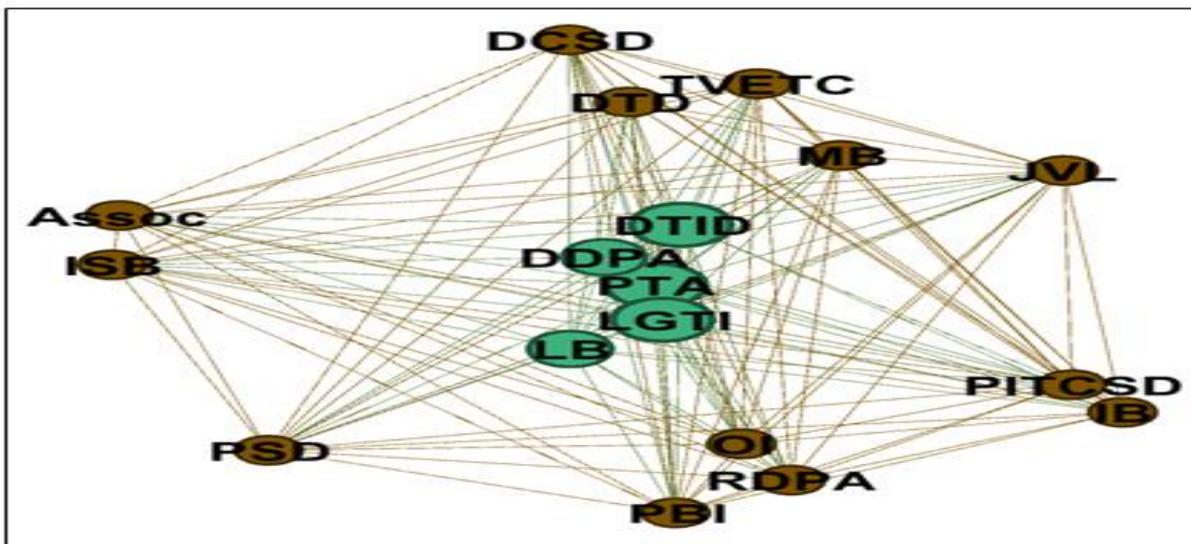
The SME clusters' development in Bontang was supported by nine actors. The actors were the DCSD, TVETC, JVL, RDPA, DTID, LB, PTA, LGTI, and DDPA, where they influenced three centrality paths, namely closeness, betweenness, and eigenvector centrality. In particular, there were some actors whose specific contributions in strengthening the cluster networks were able to reach 16 out of the 20 targeted points within the cluster network strengthening program. As for the conclusion, the SME clusters in Bontang had a good quality and network performance, as indicated by their various centrality distribution, and the actors' numbers that influenced their networks. The existence of these SME clusters could be improved if most actors had specific contributions in strengthening the clusters, in order to better organise and manage the networks' management. Figures 10, and 11, provide a visualisation of the SME clusters in Bontang.

**Figure 10.** Seaweed Cluster



The networks in the seaweed cluster were dominated by the interactions of local government actors. Therefore, the pattern that mostly occurred was from the Government to the business actors. The actors that dominated the interaction, among others, were the DCSD, TVETC, JVL, RDPA, and DTID. Their roles were through the three centrality paths of closeness, betweenness, and eigenvector centrality. Generally, the quality of the seaweed cluster networks was already good, yet this cluster needed to improve its network performance by empowering non-government actors, associations, and the representatives of the business actors.

**Figure 11.** Bontang Handicraft Cluster



The handicraft cluster network structure consisted of closeness, betweenness, and eigenvector centrality. However, the weakness appeared in the form of a lack of network strengthening

policies from the related provincial government. Only one provincial institution dominated the network, but its role was only limited to promoting the products provided by the PTA. Additional actors with important roles in this cluster were the LB, LGTI, DTID, and DDPA.

## **Conclusion**

Generally, the actors' involvement in the SME clusters in East Kalimantan provides the proper and appropriate performance in managing the network, as shown by their various roles in planning, policy, and technical aspects, which can be integrated and collaborated well. This research found two levels of actors that have influence within the clusters. The PITCSD, and DTID were positioned in rank one, and the TVETC, DTD, PSD, and LGTI were categorised in rank two. The quality of the SME networks in each region referred to the five role priorities of those actors. Furthermore, determining the network quality was based on three indicators, which were actors participating in the cluster, a centrality approach, and the target achievement of the network strengthening program. The more actors who participate, and the more complete the centrality approach, the better the cluster network becomes.

The SME clusters in Samarinda were mostly small scale, where this level of business was the responsibility of the municipality government. However, activities in the SME cluster network in Samarinda were mostly dominated by the provincial government institutions. This reality indicates that the frequency of interaction among provincial government institutions was higher, and more intensive than the interaction among the Samarinda City Government. There are two key findings that need to be explained in relation to the SME cluster networks in Samarinda. Firstly, there was an increase in the degree of centrality by the actors responsible for the development of SME business actors. Secondly, there were efforts to empower the joint venture, and the associations to build, through communication, with their business partners.

Balikpapan has a strategic location and supporting infrastructure. These factors positively contributed to the network performance of the SME clusters. The actors of the clusters collaborated synergically in their interactions through networks among the actors. The relationship of the actors from various backgrounds, and levels became both a counterweight, and a control in their work, which was based on their roles, and authorities within the network. Furthermore, the ability of the Balikpapan SME clusters to penetrate the market was better when compared to the other regions. Meanwhile, Bontang has two kinds of SME clusters, when compared to the Balikpapan SME cluster. The network performance of the SME clusters in Bontang was worse, although both the Balikpapan clusters, and the Bontang clusters had a similar quality in their centrality diversity. The SME clusters in the three researched areas have distinctive characteristics, and challenges. From the network



management point of view, it can be concluded that the SME clusters in Balikpapan are the clusters that have the best network management.

For the concluding remarks, this research has found that the networks of SME clusters are determined by three factors. The first factor is their actor diversity, which influences upon the cluster network. The second factor is the diversity of a centrality approach. The third factor is the achievement of targets for strengthening the networks. A cluster can be considered to have a good performance if it is supported by four actors: the provincial institutions; the local government institution; the business actors incorporated in the association, and the joint venture; and the supporting institutions. Subsequently, to strengthen a cluster network, actor diversity must play a role in centrality diversity, which are specifically degree, closeness, betweenness, and eigenvector centrality. The collaboration between actor diversity, and centrality diversity must refer to the basic concepts of the cluster, specifically, commonality, concentration, and connectivity.



## REFERENCE

- Agusyanto, R. (2014). Jaringan sosial dalam organisasi (Edisi Revisi). *Jakarta: PT Raja Grafindo Persada*.
- Badi, S., Wang, L., & Pryke, S. (2017). Relationship marketing in Guanxi networks: A social network analysis study of Chinese construction small and medium-sized enterprises. *Industrial Marketing Management*, 60, 204-218
- Dayasindhu, N. (2002). Embeddedness, knowledge transfer, industry Clusters and global competitiveness: A case study of the Indian software industry. *Technovation*, 22(9), 551–560. [https://doi.org/10.1016/S0166-4972\(01\)00098-0](https://doi.org/10.1016/S0166-4972(01)00098-0)
- Dewhurst, M., Heywood, S., & Rieckhoff, K. (2011). Preparing your organization for growth. *Mckinsey Quarterly-Organizational Practice*, 1-5
- Dipta, I. W. (2005). Pengembangan kluster bisnis untuk memperkuat daya saing usaha kecil dan menengah. *infokop, Nomor*, 27, 63-73
- Dipta, I. W (2010). Pengembangan Klaster Untuk Daya saing UMKM Menghadapi ACFTA. *Infokop Volume 18*, 101 – 124
- Djamhari, Choirul. (2006). "Faktor-faktor yang mempengaruhi perkembangan sentra UKM menjadi kluster dinamis." *Infokop nomor 29*, 83-91.
- Fauzi, A. (2018). Analisis faktor-faktor yang mempengaruhi produktivitas usaha kerajinan sarung tenun pada ukm cahaya di samarinda. *EJournal Administrasi Bisnis*, 6(3), 985–996.
- Feldman, M. P., Francis, J., & Bercovitz, J. (2005). Creating a cluster while building a firm: Entrepreneurs and the formation of industrial Clusters. *Regional Studies*, 39(1), 129–141. <https://doi.org/10.1080/0034340052000320888>
- Henry, S. Brahmantio, I. S. S. (2002). *SME clusters in Indonesia : An analysis of growth dynamics and employment conditions report to the international labour organization October 2002* (Vol. 2002). International Labour Organization.
- hodgson, g. m. (2016). The revival of veblenian institutional economics. *Journal of Economic Issues*, 41(2), 324–340. <https://doi.org/10.1080/00213624.2007.11507019>
- Iriani, A., & Priyanto, S. H. (2013). Modeling of employee relationships in sme batik: case study of windasari batik. *Asian Journal of Management Sciences & Education*, 2(4), 22–35.



- Jovita, H. D., Nurmandi, A., Mutiarin, D., & Purnomo, E. P. (2018). Why does network governance fail in managing post-disaster conditions in the Philippines?. *Jamba (Potchefstroom, South Africa)*, 10(1), 585. doi:10.4102/jamba.v10i1.585
- Lee, Y., Shin, J., & Park, Y. (2012). The changing pattern of SME's innovativeness through business model globalization. *Technological Forecasting and Social Change*, 79(5), 832–842. <https://doi.org/10.1016/j.techfore.2011.10.008>
- Lyon, F., & Atherton, A. (2000). A business view of clustering: Lessons for Cluster development policies. *Foundation for SME Development*
- Marijan, K. (2005). Mengembangkan industri kecil menengah melalui pendekatan kluster. *Insan*, 7(3), 216–225. Retrieved from [www.journal.unair.ac.id](http://www.journal.unair.ac.id)
- Mawardi, M. K., Choi, T., & Perera, N. (2011). The Factors of SME cluster developments in a developing country: The case of Indonesian Clusters. *ICSB World Conference Proceedings*, 1–28.
- Mercedes Delgado, Michael E. Porter, S. S. (2012). Clusters, convergence, and economic performance. *Nber Working Paper Series*.
- Morosini, P. (2004). Industrial clusters, knowledge integration and performance. *World Development*, 32(2), 305–326. <https://doi.org/10.1016/j.worlddev.2002.12.001>
- Munnich Jr, L. W., Schrock, G., & Cook, K. (2002). Rural Knowledge Clusters: The challenge of rural economic prosperity. *Reviews of Economic Development Literature and Practice: No. 12*, (12). 104-117.
- Nainggolan, R. T. (2015). Peran dinas koperasi dan usaha kecil menengah (ukm) dalam pemberdayaan pengrajin sarung samarinda di kecamatan samarinda seberang. *EJournal Ilmu Pemerintahan*, 3(2), 850–862.
- Narain, C., Scott, S. K., Wise, R. J. S., Rosen, S., Leff, A., Iversen, S. D., & Matthews, P. M. (2003). Defining a left-lateralized response specific to intelligible speech using fMRI. *Cerebral Cortex*, 13(12), 1362–1368. <https://doi.org/10.1093/cercor/bhg083>
- North, D. C. (2016). Institutions and economic theory. *The American Economist*, 61(1), 72–76. <https://doi.org/10.1177/056943459203600101>
- Nurmandi, A., Muallidin, I., Priyo Purnomo, E., & Suryanto, S. (2016). The Indonesia's police reform police in the reform era new institutionalism perspective. *Journal of Government and Politics*, 7(2), 265–288. <https://doi.org/10.18196/jgp.2016.0029>



- Otte, E., & Rousseau, R. (2002). Social network analysis: A powerful strategy, also for the information sciences. *Journal of Information Science*, 28(6), 441–453. <https://doi.org/10.1177/016555150202800601>
- Sabatier, P. A. (1999). A comparison of frameworks, theories, and models of policy processes. In *Theories of the Policy Process*. <https://doi.org/10.1081/E-EPAP2-120041405>
- Sandelowski, M., Holditch-Davis, D., & Harris, B. G. (1992). Using qualitative and quantitative methods: The transition to parenthood of infertile couples. *Qualitative methods in family research*, 301-322
- Sandriana, N. (2015). *Perencanaan pengembangan produk unggulan daerah berbasis kluster (Studi Pada Sentra Industri Kecil Dan Menengah Kota Malang)* (Doctoral dissertation, Universitas Brawijaya)
- Schatzman, L., & Strauss, A. L. (1973). *Field research: Strategies for a natural sociology*. Prentice Hall
- Serrat, O. (2017). Knowledge solutions: Tools, methods, and approaches to drive organizational performance. *Knowledge Solutions: Tools, Methods, and Approaches to Drive Organizational Performance*, 1–1140. <https://doi.org/10.1007/978-981-10-0983-9>
- Setatama, M. S., & Tricahyono, Ir., M.M., Ph.D., D. (2017). Implementasi social network analysis pada penyebaran country branding “wonderful Indonesia.” *Indonesian Journal on Computing (Indo-JC)*, 2(2), 91. <https://doi.org/10.21108/indojc.2017.2.2.183>
- Tambunan, T. (2005). Promoting small and medium enterprises with a Clustering approach: A policy experience from Indonesia. *Journal of Small Business Management*, 43(2), 138–154.
- Tambunan, T. (2011). Development of small and medium enterprises in a developing country The Indonesian case. *Journal of Enterprising Communities: People and Places in the Global Economy*, 95(1), 68–82. <https://doi.org/10.1108/17506201111119626>
- Thomas, L. G. M. K. D. (2016). Industry clustering and unemployment in US regions: An exploratory note. *Munic Personal RePEC Archive*, 11(12), 1–33. <https://doi.org/10.1227/01.NEU.0000349921.14519.2 A>
- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications* (Vol. 8). Cambridge university press



### List of Abbreviation

1	Assoc.	Association
2	DCSD	District Cooperative and SME Department
3	DDPA	District Development Planning Agency
4	DITD	District Industry and Trade Department
5	DTD	District Tourism Department
6	GDP	Gross Domestic Product
7	IB	Indonesian Bank
8	ISB	Indonesian State Bank
9	JVL	Joint Venture Leaders
10	LB	Local Bank
11	LGTI	Local Government Technical Institution
12	MB	Mandiri Bank
13	OI	Others Institutions
14	PBI	People's Bank of Indonesia
15	PITCSD	Province Industry, Trade Cooperative, and SME Department
16	PSD	Province Social Department
17	PTA	Province Tourism Agency
18	RDPA	Regional Development Planning Agency
19	SMEs	Small and Medium-Sized Enterprises
20	SNA	Social Network Analysis
21	TVETC	Technical and Vocational Education and Training Centre