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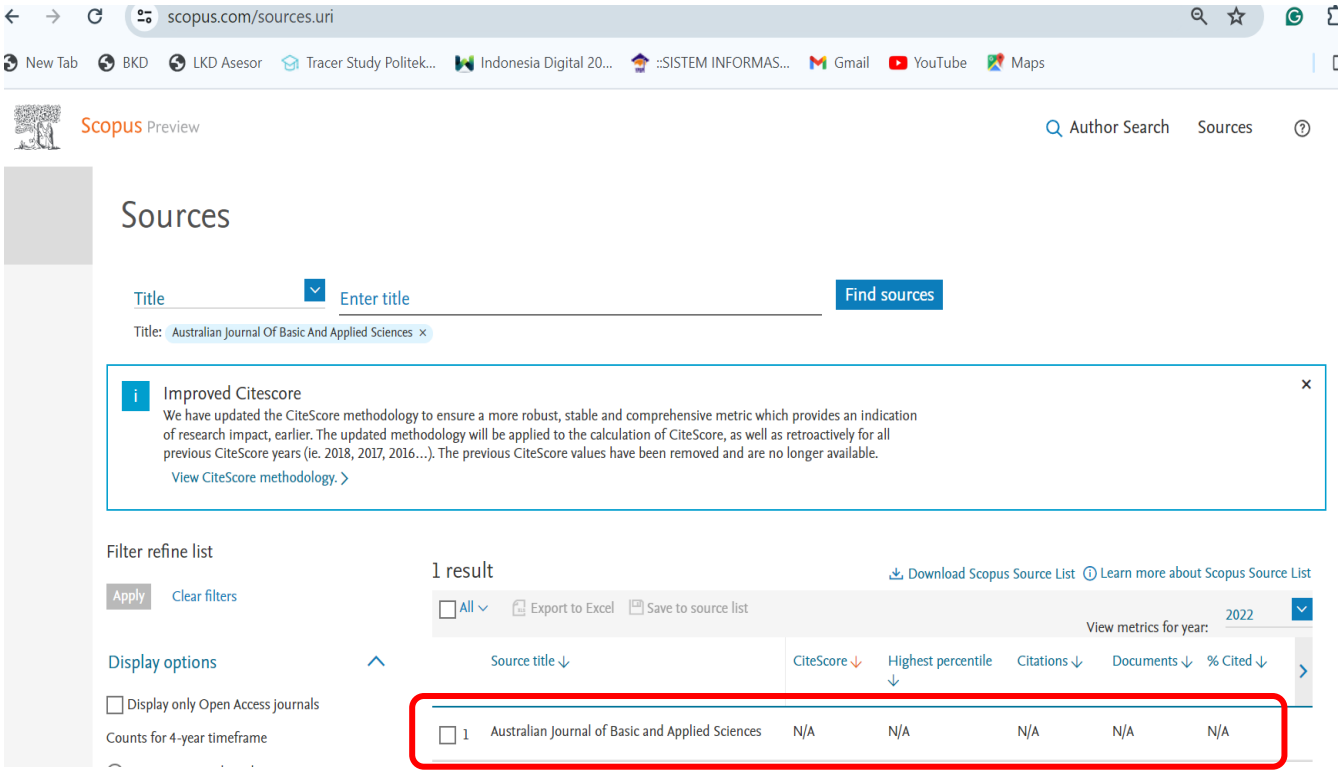

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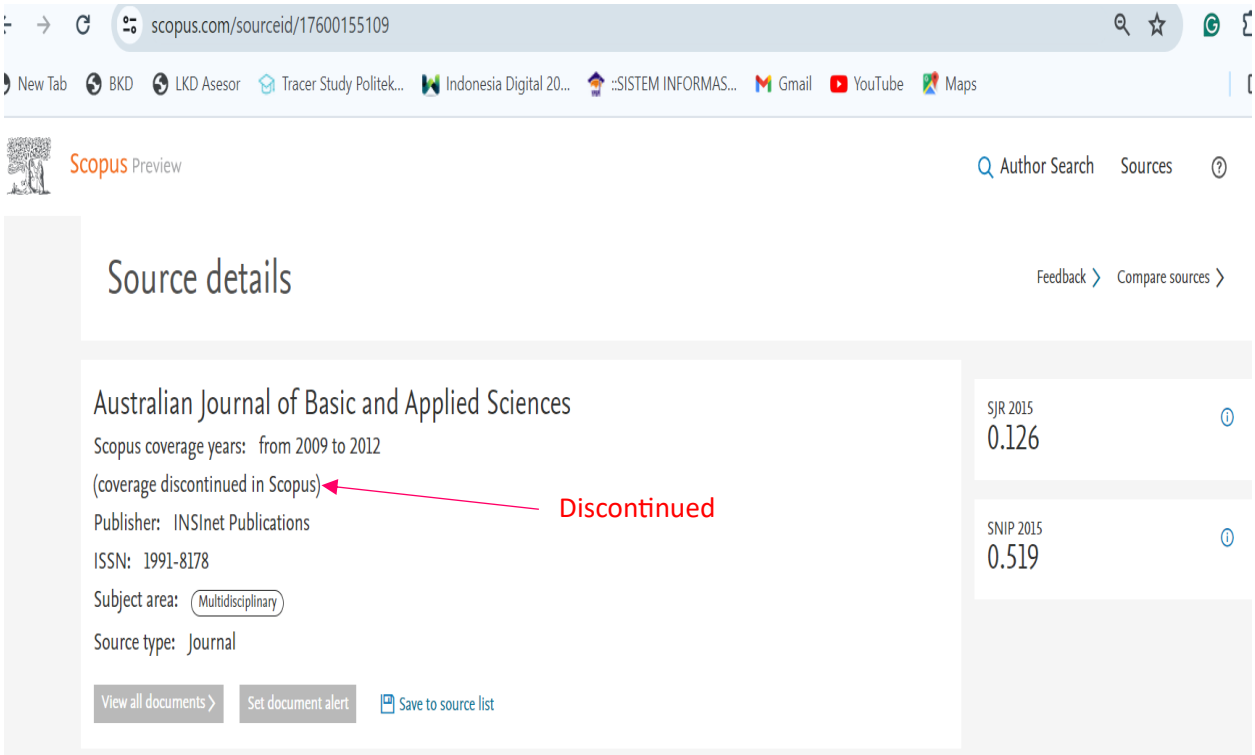

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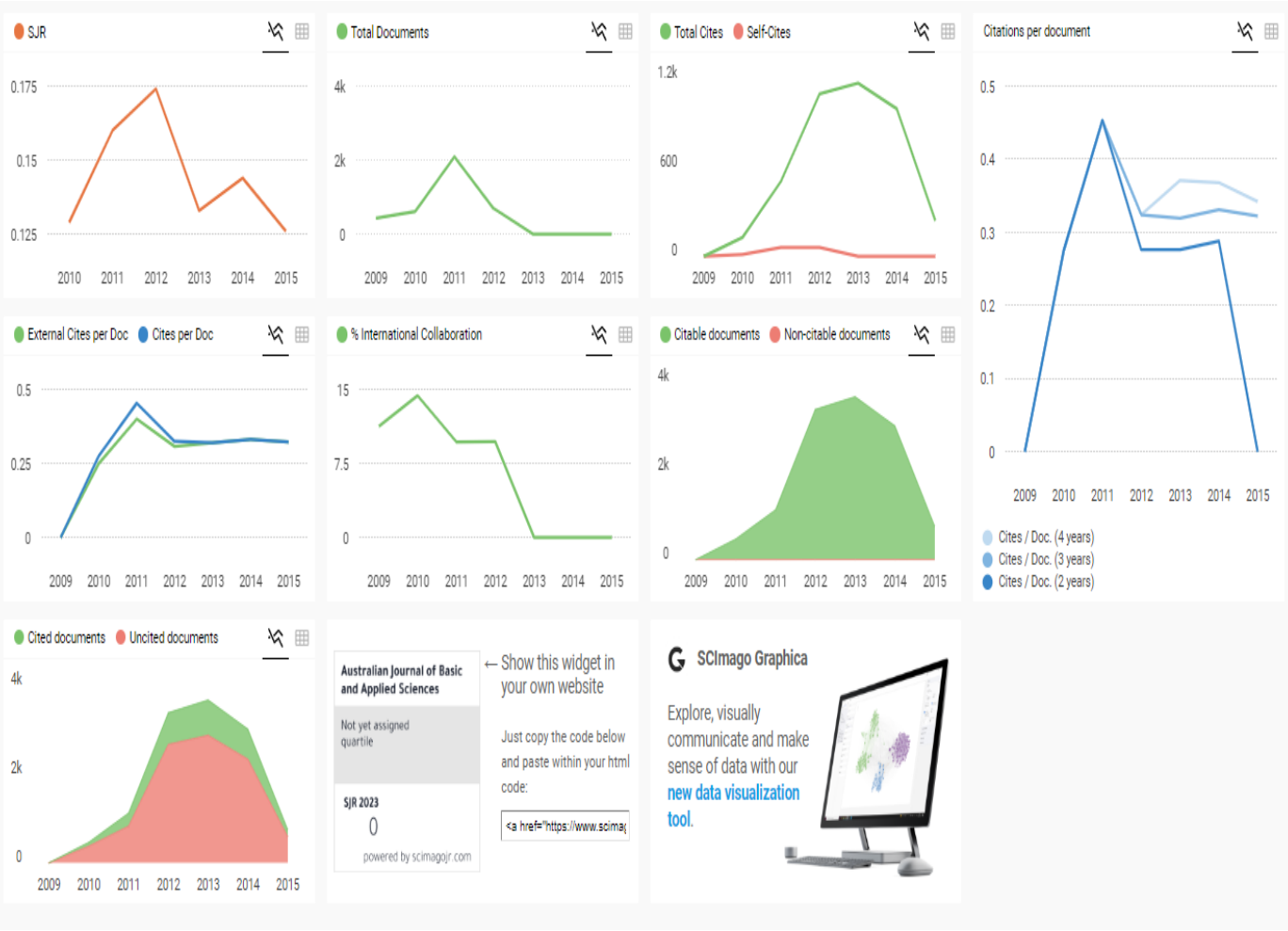

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ABSTRACT

Background: Cluster supply chain is a collaborative network of organizations to maximize the value of the end products to customers, make quick decisions, decrease cycle time and increase flexibility in response to customer demand. Cibaduyut shoe industry is a small cluster supply chain network as there are companies that collaborate ranging from manufacturers, distributors and retailers. It is not yet known how this small industrial cluster performance and not known what the dominant factors that influence the success of a small cluster supply chain industry Cibaduyut shoes. **Objective:** to analyze the performance of cluster supply chain and analyze the dominant factors that affect the success of a small industrial clusters Cibaduyut shoe . **Results:** Schedule of agglomeration can be displayed dendogram depicting a hierarchy of clusters and the grouping of Discrimination Analysis obtained 3 clusters, namely high performance industrial clusters, industrial cluster performance medium, and low performance industrial cluster. While the dominant factors that affect the success of cluster supply chain, ie factors : technology, marketing, and culture industry. **Conclusion:** to improve the performance of the cluster needs to be improved production techniques and knowledge of raw material, improvement of business management skills and capabilities of information technology to stimulate product innovation, facilitation of local governments to financial institutions for capital improvement and assist the promotion of products such as fairs and exhibitions, as well as encouraging to be able to produce products with its own brand.

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INTRODUCTION

The concept of industry cluster was popularized by Michael E. Porter in his book called "Competitive Advantage of Nations", which is more industrial cluster is seen as a group of related companies with similar activities within a national economy rather than just lie in the specific location. Therefore, the most important factor in the industrial cluster is the presence of linkage between the companies in a particular sector or to other sectors but mutually supportive. Territorial aspect is not rigidly constrained. Second, industry cluster focused on a group of industries that exist in a given region (Porter, 1990).

Indonesia's industrial clusters into four groups. The first is 'dormant cluster', which is largely dominated by the informal sector, with more than 90 percent of industrial clusters in Indonesia categorized in this group. The second is the 'active cluster', which already has the ability to repair technologies owned and improve the quality of its products. However, its products are still likely to be marketed in the country. Third is the 'dynamic clusters', which in addition have been able to improve the technology and quality of products, the cluster group can begin to build a network in marketing their products abroad. The latter is a 'modern or advanced cluster', which has been able to implement high-level technology to produce goods that berkualiats and able to market its products, both in domestic and international markets (Supratikno, 2004).

Supply Chain is a network of companies (suppliers, manufacturers/ factories, distributors, logistics service povider, retail/ store / retailer) together to create and deliver a product into the hands of end users. In networks such companies there is a series of interrelated business processes, namely: procurement of materials and components, and the transformation of raw materials into finished products through value-added process, the resulting distribution of products to customers, the exchange of business information between the various elements involved in the Supply Chain (Pujawan, 2005).

Cluster Supply Chain is a collaboration between supply chain partners that aims to improve the utilization and synchronization resulting in tangible benefits for all participating companies (Anand & Hanna, 2000). In this context, the concept of cluster supply chain can be seen as a collaborative network of organizations that

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work together to maximize the value of the end products to customers, make quick decisions, decrease cycle time and increase flexibility to respond to changing customer demand (Romano, 2003).

Cibaduyut a small shoe industry center in the city of Bandung. Small Industries Cibaduyut shoes can be said to form a cluster for which there are supply chain networks that collaborate consists of many companies that act as producers, distributors and retailers. Based on the existing data on Cibaduyut Technical Services Unit, Business Unit number in 2013 was as much as 845 units, with the support of existing industrial units covering 152 showrooms / outlets, 4 commercial centers, 38 store raw materials and auxiliary materials, industrial 8 shoelast/ rough benchmark, three industrial equipment and spare parts, 15 industrial packaging, industrial units and five rubber sole, with a total workforce of 3556 people.

This is a decline of the number of workers available in the prior year, as many as 6,045 people. The decrease in the number of workers as a result of a decrease in production capacity, due to the level of demand for the lower population. Footwear production capacity in 2013 was 2.98446 million pairs of shoes per year, whereas in 2012 amounted to 8,530,000 pairs per year. During the period 2003-2013 the world footwear market demand increased by an average of 2.2 % per year and domestic demand exceeded the average increase in world demand, but the ability of small industry offers Cibaduyut shoes tend to decline. This shows the low flexibility in responding to changes in the cluster customer demand. The low performance of a small cluster of Supply Chain industry Cibaduyut shoes , according Kacung Marijan (2005) deals with the factors that affect the success of small industries, namely : raw materials, equipment, processes of production, finance, energy, labor, product, marketing, capital, capabilities employers, industry and culture.

Thus the problem of this research is how the performance of clusters and what the dominant factors that influence the success of a small cluster supply chain industry Cibaduyut shoes. Based on the above problems, the purpose of this study is to analyze the performance of cluster supply chain industry Cibaduyut small shoe that focuses on integrated processes and linkages, and analyze the dominant factors that affect the success of a small industrial clusters Cibaduyut shoes.

Theoretical Background:

Cluster according to Porter (1998), is a group of interconnected companies are geographically contiguous with relevant institutions in a particular field, because they are connected together and complement each other. With these definitions, an industrial cluster can include suppliers of raw materials and inputs specific to downstream (market or exporters), as well as business associations government agencies, service providers and other institutions (universities, training institutions) that supports firms - companies in the cluster. According to Malmberg and Power (2005), critical success factors in the development of the cluster is composed of tissue factor in the partnership and collaboration of knowledge creation factors for innovative technology. This knowledge is created through various forms of collaborative interaction between local organizations. The supply chain is integrated in the core business of the industry cluster. Both of them focus on improving the competitive advantage over their competitors. The cluster support the supply chain by integrating academic institutes, government agencies, association and supporting industry in order to create the innovation and enhance the knowledge in the supply chain (Sureephong *et al*., 2008).

Measurement performance cluster according Pujawan (2005) to be a problem for companies that define supply chain management. Many companies do not have good control because it does not know its size . Even if they know their size, they do not know how to calculate it . The company usually only know the goods in and out without knowing how the mechanism in it. With a good performance the company will know what can be saved and how many and what are the things that need to be repaired. Improvement of business processes within a supply chain can only be done if known how to supply chain performance, one goal is to meet a performance measurement system is a cluster :

1) To monitor and control the supply chain.
2) Communicate organizational goals to the functions on the supply chain.
3) Knowing where to position the company against competitors relatiff and the goals to be achieved.
4) Determine the direction of improvement for creating competitive advantage within.

Supratikno (2004) suggests criteria for effective performance measurement cluster include :

1) Measure the performance of the cluster as a whole and not just measure the individual members of the supply chain.
2) Focusing on continuous improvement of the customer service end.
3) Allows the manager not only identify, but also eliminate the cause of the problem of supply chain operations.

In terms of improving the effectiveness of supply chain models, according Pujawan (2005) performance measures should be chosen so as to enable the analysis of a more complete and accurate. Through this cluster performance, managers can obtain information about the extent to which the implementation of a plan, and at the point where they had to perform an adjustment on the planning and control in the future. It is intended to achieve the output is more in accordance with the strategic objectives set by the company.

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Research Method:

Supply Chain Analysis of the performance of clusters of small industries Cibaduyut shoes will explain the process and integrated linkage from upstream to downstream from the supplier, subcontracting, core industry, and retail. At the core of the industry will be a core industry groupings based on their business performance by using discriminant analysis with the help of software SPSS 16. Research data collection is done by distributing questionnaires to the 30 industry groupings based on the core with variable : Age company, number of employees, capital companies, sales per year, and earnings per year. The number of suppliers of the company examined by 8 variables studied were : price, quality, quantity, and service. Subcontract Number examined as many as 20 companies with the variables studied were : production facilities, cost of production, process time, quality product. While the number of retail companies surveyed as many as 50 variables studied were : Ability promotions, sales ability, and price products accordingly.

Preferred method of grouping is hierarchical cluster analysis that uses Agglomerative Methods. Grouping procedure used is Ward 's Error Sum of Square Method. Ward 's method guarantees the difference between clusters is minimized and when compared with other methods, Ward's method has a better comprehensiveness. Distance or similarity measurement techniques used in data processing is the Squared Euclidean Distance. Basically the determination of the number groups can be either a priori or by looking at the table agglomeration. In this study, the reading will be done by looking at the results table agglomeration agglomeration coefficient. For the three alternatives tried defined number of clusters is 3, 4, and 5 clusters. From processing cluster analysis with SPSS Software Version 16 will be obtained Case Processing Summary, Proximity Matrix, agglomeration Schedule, and Cluster Membership which can be used to interpret the number of clusters.

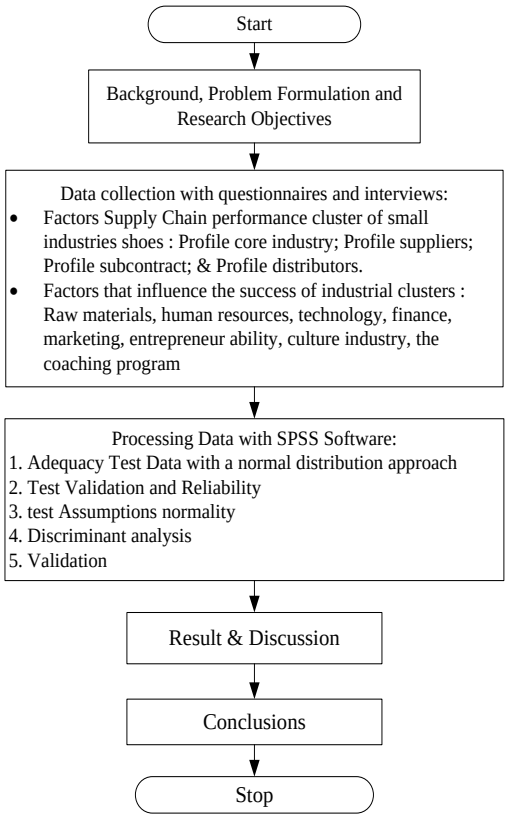

Fig. 1: Stages of problem solving research.

The results of cluster analysis are summarized in Schedule agglomeration which identifies objects or clusters combined at each level. In the agglomeration method, starting with the fact that each object forming groups respectively. Results Schedule agglomeration agglomeration in the table can also be displayed with a dendogram. Dendogram is a diagram illustrating the grouping hierarchy. By looking at the diagram dendogram we can know the order of grouping and group members. From the results of the cluster membership produced the recapitulation of the grouping process. In the data processing is done with some alternative clustering the number of clusters is 3, 4, and 5 groups. To determine the exact amount of validation group to test the different methods, namely K-Means method. Stages of problem solving research are presented in Figure 1.

RESULTS AND DISCUSSION

Profile core industry (companies) Cibaduyut shoe cluster obtained from the questionnaire, and the interviews are presented in Table 1. Data processing is performed using SPSS 16 software. Because data on industry performance is measured with different scales, then the standardization of data. The raw data for 30 respondents to the variable transformed into Z scores (standardized). Preferred method of grouping is hierarchical clustering method that uses agglomerative cluster analysis methods. Grouping procedure used is Ward's Error Sum of Square Method. Distance or similarity measurement techniques used in data processing is the Squared Euclidean Distance.

Results Schedule agglomeration in the table can be displayed with a dendogram. Dendogram is a diagram illustrating the grouping hierarchy. By looking at the diagram dendogram we can know the order of grouping and group members (Figure 2).

Table 1: Profile shoe industry cluster core Cibaduyut 2013.

No.	Company	Years of existence	Number of Employees	Capital (Rp)	Sales (Rp)	Profit (Rp)
1	Aneka	1989	4	200,000,000	500,000,000	100,000,000
2	Basama Basoga	1996	5	50,000,000	60,000,000	12,000,000
3	Diana	1989	28	350,000,000	2,500,000,000	500,000,000
4	Silvi Shoes	2006	2	80,000,000	60,000,000	12,000,000
5	Trio	1997	10	150,000,000	1,400,000,000	280,000,000
6	Royal	2002	8	40,000,000	600,000,000	120,000,000
7	Aldymore Shoes	2000	4	10,000,000	120,000,000	24,000,000
8	Picanto	1995	4	15,000,000	60,000,000	12,000,000
9	Ega Shoes	1997	6	40,000,000	36,000,000	7,200,000
10	Pormil	1994	17	200,000,000	1,500,000,000	300,000,000
11	Gian Ghie	2000	3	10,000,000	60,000,000	12,000,000
12	Ogan Jaya	1995	2	10,000,000	36,000,000	7,200,000
13	Annisa Jaya	1998	3	10,000,000	36,000,000	7,200,000
14	Tiara Shoes	1989	25	300,000,000	2,000,000,000	400,000,000
15	Parunten	1996	9	61,000,000	600,000,000	120,000,000
16	Oval	1994	23	200,000,000	1,500,000,000	300,000,000
17	Asra	2005	2	5,000,000	72,000,000	14,400,000
18	Mega Cibaduyut	1990	10	20,000,000	600,000,000	120,000,000
19	Koyoko	2003	3	8,000,000	36,000,000	7,200,000
20	Chaira Shoes	1995	3	30,000,000	300,000,000	60,000,000
21	Almond	2001	2	10,000,000	36,000,000	7,200,000
22	CBU	2003	2	15,000,000	48,000,000	9,600,000
23	Picanto	1995	4	15,000,000	60,000,000	12,000,000
24	Mitako	1996	10	127,500,000	720,000,000	144,000,000
25	Repalts	1996	4	10,000,000	72,000,000	14,400,000
26	Gontina	2000	6	15,000,000	60,000,000	12,000,000
27	Inntany	2000	4	10,000,000	36,000,000	7,200,000
28	Dian Sari Pratama	1999	4	20,000,000	180,000,000	36,000,000
29	Ocssa	1999	2	30,000,000	120,000,000	24,000,000
30	D'Class	1990	3	30,000,000	36,000,000	7,200,000

The results of the cluster membership processing recapitulation of the process of grouping a number of clusters that alternative 3, 4, and 5 groups, then validated by conducting tests with different methods, namely K-Means method. Results of method validation by comparing hierarchical and K-means cluster 3 showed that the amount that produces the differences are slight compared to clusters 4 and 5. So in this study based on the results of the discriminant analysis of core industries are grouped into 3 groups are depicted in Figure 2, and grouping the results are presented in Table 2.

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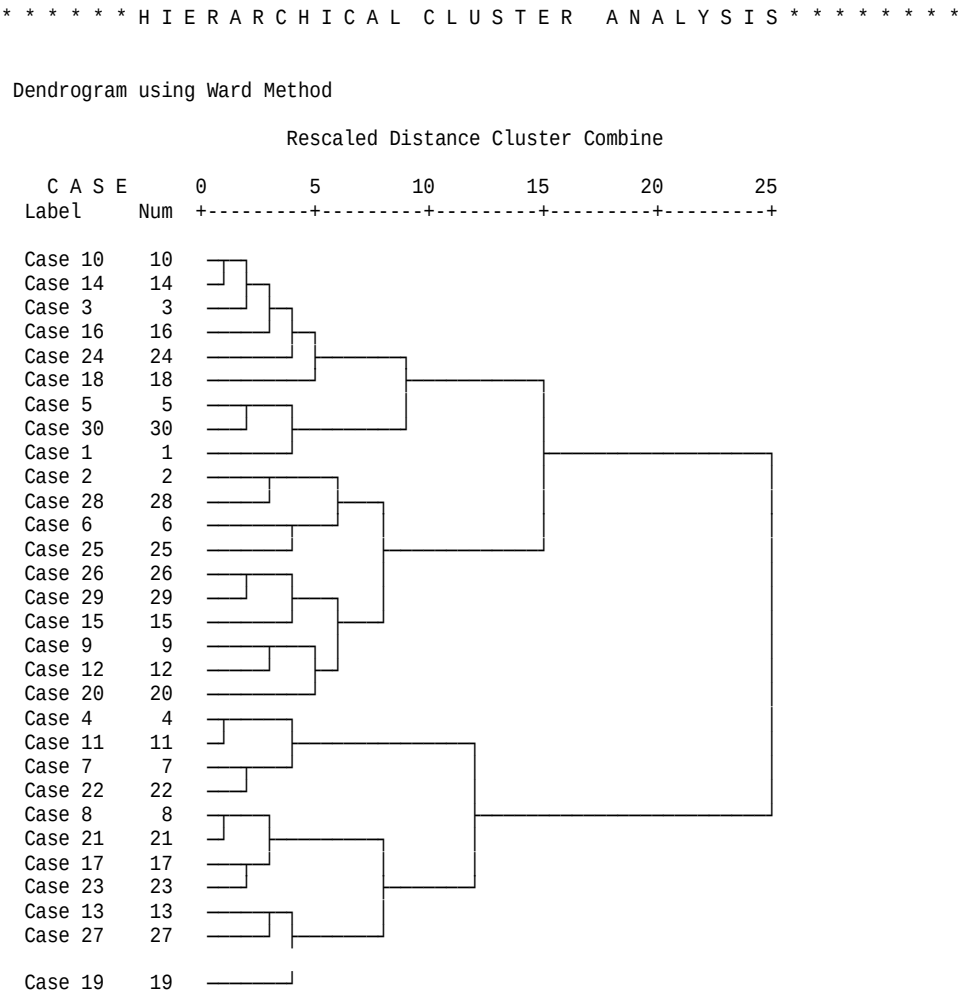

Fig. 2: Hierarchical cluster analysis dendogram.

Table 2: Grouping Results of Industry Cluster Core.

Cluster	Number of Companies	No. Respondents	Companies
1 High cluster	9 (30)%	10, 14, 3, 16, 24, 18, 5, 30, 1.	Pormil, Tiara Shoes, Diana, Oval, Mitako, Mega Cibaduyut, Trio, D'Class, Aneka.
2 Medium cluster	10 (33%)	2, 28, 6, 25, 26, 29, 15, 9, 12, 20.	Basama Basoga, Dian Sari Pratama, Royal, Repalts, Gontina, Ocssa, Parunten, Ega Shoes, Ogan Jaya, Chaira Shoes.
3 Low cluster	11 (37%)	4, 11, 7, 22, 8, 21, 17, 23, 13, 27, 19.	Silvi Shoes, Gian Ghie, Aldymore Shoes, CBU, Ellyza, Almond, Asra, Picanto, Annisa Jaya, Inntany, Koyoko.

High Performance Cluster Analysis:

High performance cluster is a high performance industrial clusters because the average size of the company's performance has been achieved as a minimum firm age 17 years, at least 14 workers, capital of at least Rp. 175 million), the sale of at least Rp. 887 million, and a profit of at least Rp.177 million. It can be interpreted that the high performance industry has made a long effort, using more labor, capital issued by large, so the turnover and profit generated is also great. Incoming high industries cluster is a medium-scale enterprises that already have the ability to serve customers and the ability to operate efficiently and effectively with both. This can be seen as follows:

1) Distribution. Forward linkage is forward linkages with the distribution which is owned outlets or the store itself with an attractive appearance and large in size with the services of the employees of the marketing is good. Companies in this cluster have had two or more outlets or stores. Besides this cluster receives orders from famous brands and distributes its products to department stores or shoe stores other famous .

2) Supplier. Backward linkage ie backward linkages with suppliers identified have been carried out in collaboration with the manufacturer of the raw material (leather factory and soles). This is due to the cluster and

the capital has had great sales.This integration will allow a specialized supplier of track that will get the product in quantity and quality, price, and punctuality are expected.
3) Capital. With large capital and labor are plentiful, companies in this cluster has a large production capacity. But if the production capacity can not meet the work order will be subcontracted. Where subcontracting is chosen to have a good product quality criteria with time job right. Increased capacity and subcontracting performance will increase with an increase in the production ability of the core.
4) Quality of Human Resources . The ability of labor in the manufacture of shoes can be obtained through training, courses or because of environmental factors that support be self-taught. The continued development of workforce capability by increasing the education level, the cluster has been the entry of skilled workers such as college graduates and graduate Diploma 3 Degree (S1) maybe even the business owner has no educated S2. .
5) Production Technology. An increase in technology and innovation play an important role in increasing the capacity of the production process. Improved production processes and production process capability improvements can also improve working procedures, improvement of labor skills, and the availability of other supporting facilities such as information technology has been used in the process of product design , management , and marketing. Improved technological capabilities and innovation that led to the size of the core industries in the category of high performance industry.

When viewed from the lifecycle of Small and Medium Enterprises (SMEs), then the cluster is in the development stage to the stage of maturity, so that cluster development is directed as follows:
1) It should be arranged so that it can obtain a request cluster that are continuous, with varying product demand characteristics. This is done by encouraging retail sales with products that varied.
2) Increase primarily promotional campaign to brand itself by enhancing the ability to master information technology, so as to expand both domestic market and export markets.
3) Increased production of technical capability in terms of design development, technology, raw materials, and encourage new innovations.

Medium Performance Cluster Analysis:

Performance cluster being an industry average performance, it can be seen in the average age of the company 12 years, the average labor 5 people, the average capital of Rp. 30 million, the average sales of Rp. 206 million, and the average income of Rp. 41 million. Core industries in this cluster are small-scale enterprises that serve the consumer's ability and the ability to collaborate efficiently and effectively with good enough. This can be seen as follows :
1) Distribution. Forward linkage, where there are outlets or self-owned stores and lease with an attractive appearance, with an area that is being. Services performed by an employee who has a family relationship as husband/ wife, son, nephew, or other relatives.
2) Supplier. Backward linkage, still weak with the procurement of raw materials (leather and soles) are all made by leathermerchant.
3) Capital. With the capital that is not too big and not much labor, companies in this cluster has a production capacity of being. When it gets big order then this cluster directly utilize subcontracted network. Where has the criteria selected subcontracting cost and good quality products into consideration.
4) Quality of Human Resources. Workforce skills in this cluster is not so high with the average high school graduate, but there are some business owners who have Bachelor.

When viewed from the Small Medium Industry life cycle, this cluster is at a stage of growth and to the development stage, in a sense has been able to get through the crisis. So that cluster development is directed as follows :
1) Increased production engineering capabilities and technological knowledge of raw materials, so as to increase the efficiency of the production process and are also able to improve the quality of products produced.
2) Improved business management skills and capabilities of information technology to stimulate innovation.
3) Facilitate the establishment of cooperation with financial institutions (Bank) in order to increase working capital.
4) Assist product promotion activities such as fairs and exhibitions, as well as encouraging to be able to produce products with its own brand.
5) Improved linkages with suppliers, subcontracting, and distributors. Like to be able to facilitate connection with the factory leather.

Low Performance Cluster Analysis:

Low performance cluster this can be seen in the average performance achieved as the average age of the company 8 years, the average labor 3, the average capital of Rp. 17 million, the average sales Rp.56 million, and the average profit Rp.11 million. Industrial core of this group is a micro-scale or household 's ability to serve customers and the ability to operate efficiently and effectively is still low. This can be seen as follows :

1) Distribution. Forward linkage, has no outlet or store, only a small part of the hire outlets or stores. The industry group is mostly made shoes to order or supply stores in the area and outside Cibaduyut Cibaduyut.
2) Supplier. Backward linkage is still very low, the procurement of raw materials and leather soles leather made by traders.
3) Capital. With little capital and labor are limited, then the cluster largely rely on subcontracting in the production process. Where all stages of production subcontracted. For the selection of cluster subcontract this relied on the quality and price priority.
4) Quality of Human Resources . The ability of human resources or labor on this cluster categorized as low average to average high school graduates, as well as the owner of the company. Service to consumers is still low and does not use information technology for both administrative and product design.

If seen in the life cycle of Small Industry Medium, this cluster is at an early stage (establishment) to the growth stage. Then the cluster development is directed as follows:
1) Increased production of technical capability and increased technological knowledge of raw materials, so as to increase the efficiency of the production process and also able to improve the quality of products produced.
2) Facilitate the establishment of cooperation with financial institutions (Bank) in order to increase business capital, it must be even klastre venture capital in order to continue to survive.
3) Improved business management skills and ability to manage the company's information technology and product design in order to be better.
4) Assist product promotion activities such as fairs or exhibitions.
5) Improved linkages with suppliers, subcontracting, and distributors.

Analysis of the dominant factors that affect the success of the Shoe Industry Cluster Supply Chain Cibaduyut:

Analysis of factors that affect the success of the cluster is done by analyzing the variables that are considered internal and external influence on the success of small industrial clusters. The success and failure of small industrial clusters depends on several factors such as raw materials, human resources, technology, finance, marketing, the ability of employers, training programs, and the culture industry. Of 8 (eight) the factors described again to 26 (twenty six) variables that affect the success of industrial clusters . Validity and Reliability Test Results on these variables concluded all variables valid and reliable (see Table 3).

Discriminant analysis on this model is used to determine the variables that contribute a lot to the success or differences performasi small industrial clusters. Where the determination of the variables that affect the success is determined by the industry (industrial core). Because the perpetrators will know in depth the needs they need to manage and promote their business. The purpose of the determination of the variables that affect the success of the industry cluster is the basis for policy formation or development of industrial clusters in the framework of the development of small and medium industries.

From processing using SPSS software in discriminant analysis of the 26 variables in general show the average group showed a difference between the three groups. With a high degree of classification accuracy, which is 96.7 % achieved by the discriminant function. Based on the significance of Wilk 's Lambda value of variable production facilities, technical improvements to improve product quality, introducing product promotional activities, distribution channels and climate suitability competition between companies and environmental significance has a value below 0.05. So the fifth variable is the variable that distinguishes the behavior of the three groups on the core industry.

Of the five variables can be grouped into 3 important factors that distinguish the behavior of the industry (high performance, medium performance, industry performance is low) in achieving success, namely:
1) Factor technology (production equipment and technical improvements to improve the quality of the product). Technical improvements to improve product quality and production facilities became dominant because it involves the satisfaction of consumers will buy the product. If consumers are satisfied with the quality of the product purchased, they become loyal to that product. In addition, consumers will indirectly deliver satisfaction to other consumers. For that technical improvements to improve the product should be the next priority in the development of industrial clusters.
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3) Marketing factors (suitability of distribution channels and promotional activities to introduce its products). Promotional activities to introduce products and the suitability of the distribution channels become dominant because it is one of the most important things in marketing. If the distribution and promotional activities to introduce the product made it the market will determine the products produced by the industry cluster. So the

market will be interested in the product to make a reservation. SME promotion activities in an activity that is almost never done. So that promotional activities to introduce the product should be a top priority in the development of industrial clusters.

4) Factors industrial culture (climate competition between companies and the environment). Climate competition between companies and the environment is the dominant variable in the success of the third industrial cluster. If climate conducive competition it will create a healthy business environment. But if you made a trade association between the shoe entrepreneur competition will be more conducive climate, due to the existence of any industry associations will be organized and there is no industry left or bankrupt.

Table 3: Correlation and Cronbach alpha values for the variables and factors of success Cluster Supply Chain Industry Cibaduyut Shoes.

Factor	Variable	Correlation	*Alpha Cronbach*
Raw material	Price of raw materials	0,902	0,754
	The quality of raw materials	0,796	
	Quantity of raw materials	0,907	
	Services (supply continuity and speed)	0,451	
Human resources	Qualifications (skills and experience)	0,834	0,514
	Education and workforce training	0,655	
	Salary labor	0,640	
Technology	Production equipment	0,796	0,603
	Technical improvements to reduce production costs	0,626	
	Technical improvements to improve quality	0,543	
	Technical improvements to save processing time	0,770	
Finance	Planning and financial control	0,543	0,306
	Ability to get funds	0,744	
	Access to financial institutions	0,650	
Marketing	Conformity with the price of the product quality	0,729	0,548
	Promotional activities to introduce products	0,650	
	Suitability distribution channels	0,813	
Entrepreneurs ability	Talent and personality of the entrepreneur	0,703	0,545
	Skills, knowledge & experience	0,719	
	Entrepreneurs creativity	0,752	
Program development	Education and training of government	0,841	0,623
	Credit facility of government assistance	0,760	
	Technical assistance from government	0,676	
Industry culture	Cooperation with stakeholders	0,693	0,553
	Competitive climate	0,732	
	The response to the changes	0,769	

Conclusion:

1) Cluster Supply Chain industry Cibaduyut small shoe consists of 3 clusters. First , high- performance industrial cluster is a medium- scale enterprises that already have the ability to serve customers and the ability to operate efficiently and effectively. This cluster has an advantage in terms of forward linkages , backward linkage, capital, quality of human resources, and production technology. Second, while the industrial cluster performance is the ability of small -scale enterprises are quite good in serving consumers and the ability to collaborate efficiently and effectively. This cluster has been pretty good in terms of forward linkages, backward linkage, capital, quality of human resources, and production technology. Third, the low performance of industrial clusters, namely micro-scale enterprises or households whose ability to serve customers and the ability to operate efficiently and effectively is still low. This cluster is very low ability in terms of forward linkages, backward linkage, capital, quality of human resources, and production technology.

2) The dominant factors that affect the success of the Shoe Industry Cluster Supply Chain Cibaduyut, namely : technological factors such as production equipment and technical improvements to improve product quality, marketing factors such as the suitability of distribution channels and promotional activities to introduce its products, and cultural factors such as industry climate of competition between companies and the environment.

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