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MODELING OF EMPLOYEE RELATIONSHIPS IN SME BATIK: CASE STUDY OF WINDASARI BATIK

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ABSTRACT

Batik industry in Indonesia is a traditional craft industry and is done manually. Batik industry is one of the creative industries which obtain full attention from the Indonesian government. As a creative industry, batik is very dependent on the innovative products to survive in an increasingly intense competition. Batik industry is generally done by batik SMEs with very simple management. In terms of size, capital, organization and management, batik SMEs are not comparable with clothing companies like garment. However, batik SMEs is forced by the competitive business environment to produce innovative products and to attract buyers. It is estimated that Batik industry will experience increasing pressure with the entry of competitors from other ASEAN countries and China as a result of AFTA-China in 2015. Internal collaboration in SMEs is one element that is essential for batik SMEs. Collaboration involving actors from various parts of the SMEs often occur in informal relationships and are not realized by SME management. This article attempts to examine the patterns of the actor's relationship in batik SMEs taking place in Windasari batik SME. Windasari batik SME is one of big SMEs in Sragen. This study employs saturation sampling technique for collecting data from almost all employees in Windasari batik SME. The data is analyzed using Social Network Analysis applications. The results of this study suggest that the relationships between actors in Windasari batik SME are weak and heavily dependent on just a few specific actoractors as an intermediary in making contact. Of course, these patterns of relationships are not so supportive for the efforts towards a good and effective collaboration.

Keywords: Social network analysis, batik, collaboration, informal relations, SMEs

INTRODUCTION

Batik industry in Indonesia has a strategic position. Batik has been recognized by UNESCO as an intangible cultural heritage generated by the Indonesian people. Batik industry in Indonesia is produced in nearly all regions in Indonesia with the characteristics of each area. Batik clothing has also been accepted for formal as well as informal occasions. Although there is no official record of the number of people working in the sector of batik, but based on reports from Solopos, there is approximately 165,000 people work in this sector (Solopos, October 19, 2012).

The strategic position of Batik was deemed not comparable to its industry structure and ability of its management and production. Problems with the batik industry structure are that most batik manufacturers are basically home industries done by traditional SMEs. Though the creative arts such as batik industry has always been demanded to produce a continuous breakthrough in terms of design or style that attract customers in and compete with other fashion industry. Demand to continually create a breakthrough in terms of a new design according to some researchers is not supported by the batik industry structure relying on

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traditional SMEs. As raised by Sulistiyani (2010), batik SMEs have many constraints and limited resources which have great impact on their business performance. Sulistiyani provided a number of problems faced by batik SMEs including: lack of capital, limited equipment, limited sources of natural dyes, marketing constraints, no strong partnership with the government, private sector and higher education, and management limitations.

Some studies also showed that the performance of the batik industry is still unstable. Batik industry requires long production time, and economically less attractive to investors who need quick return (Hayati, 2007). The same has been raised by (Aribawa, 2009) which refers to the slow development of batik in Lasem, the Sub-District of Pancur in Rembang Regency. This is because the development of batik cannot quickly follow fashion such as garment industry in general due to the nature of its business and production. But in fact, beyond estimation of many people, batik industry is able to make breakthroughs in the design and survive. The breakthrough is not only in terms of design, but also in color and coloring materials. In terms of colors, there is a shift in the pattern early batik toward a more varied pattern. Such changes indicate the presence of innovations in batik design.

How batik industry has developed and break away from traditional patterns cannot be separated from the internal business processes in batik SMEs. For creative industries such as batik, a breakthrough and the collaboration of actors in internal processes are inseparable. In line with the trend of increasingly lean organizational structure, the environment which is increasingly competitive and intensively knowledge, and organizations which increasingly depend on employees' collaboration to sustain innovation (Ross, et al, 2002; Steelcase Workspace Futures, 2010; Cunningham and GOK, 2012), batik SMEs should follow the same direction in order to succeed.

Since batik SMEs do not often have the organizational structure as in the modern organization, and then the actor collaboration in batik SMEs is usually reflected in informal behavior. The purpose of this article is to explain the behavior of informal relationships in one of the large batik SMEs in Sragen. Patterns of informal relationships are analyzed and mapped using Social Network Analysis (SNA).

LITERATURE REVIEW

Batik

Originally batik Sragen oriented to Surakarta and Yogyakarta batik, known as batik to the palace. This is because predecessors in Sragen were working at batik manufactures in Solo and Yogyakarta (Solopos.com, 2011; Sragen Online). But in its development, batik Sragen has successfully developed its own peculiar characteristics. Yogyakarta batik typically has a white background with a pattern of black or dark color shades. Because the background is white, it is often referred to Yogyakarta batik style with a white background. The opposite of Yogyakarta pattern, Surakarta batik has a dark background with a pattern of white shades. Therefore Surakarta batik is called batik with a black background. Yogyakarta and Surakarta batik patterns which oriented to palace strongly maintain benchmark standards, such as parang, kawung, sidodrajat, and sidoluhur. The benchmark standard has philosophy foundations which are rooted in Javanese culture. On the other hand, Sragen batik has different characteristics. Sragen batik is richer with flora and fauna ornaments that are combined with the standard pattern. Lines in Sragen batik patterns tend to be more assertive and straightforward than the Surakarta and Yogyakarta batik (Solopos.com, 2012; Republika.co.id, 2013; Indonesia.go.id,). This is to conform to the tastes of the changing consumer needs.

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In terms of batik business in Sragen, number of batik business units in the year 2011 decreased from 4,795 in 2009 to just 4,702 in 2011 (Bappeda Sragen, 2011 and 2009). This indicates that the batik industry is a business full with challenges.

The biggest threat of Batik industries come from the apparel industry and batik imports from China. Apparel industry has an advantage in terms of speed of production as it uses engine and is able to keep pace with the global trend. While the batik industry are naturally traditional, need more time to produce and based on local patterns. Tougher challenges are expected to appear with the implementation of AFTA-China in 2015. Invasion of batik imports from other ASEAN countries and the most feared one is batik imports from China will increase the intensity of competition (Darmansyah and Soebagyo, 2010).

Social Network Analysis (**SNA)** in recent years, social network analysis (SNA) has emerged as a new tool to express collaboration in the organization. Organizations and researchers increasingly recognize the important role of social networks to increase collaboration in the enterprise. SNA is used to support marketing objectives, to understand how the antecedents and consequences of the establishment of relations in the network, and to analyze the interactivity between users (Ansari, et al, 2011). SNA is used also to understand social commerce network (Stephen and Toubia 2010), visualize student participation in online classes (Doran, et.al, 2011), map the learning process (de Fretes et. al, 2012), model of student knowledge sharing on social network media (Priyopradono et. al, 2012), exert supporting development in the region revitalization program development (Priyopradono et al., 2013), and understand the business incubation processes (Muniz et al, 2013).

The use of SNA provides opportunities to see the hidden patterns of informal interaction such as investigating actors and groups in team sports (Lusher and Robins, 2010). SNA allows researchers to explore social relationships of actors within a team and between teams simultaneously. In that way, researchers have flexibility to analyze various patterns of collaboration within an organization. de Fretes et al (2012) provides several features of SNA use.

The elements in the SNA can be grouped into three main categories:

Groups: A group can be a set of actors in a project or in a company division, or it could be a set of organizations in an industry. Size of a group can vary from 25 s / d 200.

Interactions: An SNA examines the relationships between actors. The nature of the relationship varies depending on the purpose of the study. Interactions between actors are called links or ties. Patterns of interaction within the group are called social networking.

Attributes: Attributes refer to the features that are owned by an actor. Attributes can help determine whether there are systemic factors that affect the interaction between individuals. Attributes can include job title, gender, or location of the individual.

To examine the relationship between individuals in a group, SNA has several methods of measurement include:

Degree Centrality: Degree centrality is the most common size of a network for measuring the number of actors who are connected to an individual. This measure indicates the position of an individual within the network.

Betweeness Centrality: It indicates the frequency of an actor lies in the shorter paths between actors in the network. This measure shows the role of an individual as a liaison with other actors and his/her potential to coordinate communication within the group.

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Closeness Centrality: Closeness centrality indicates the efficiency of an actor's role as a facilitator of integration in the network. This is calculated by how many steps needed on average for an actor to reach other actors in the network. An individual with the highest score is the most efficient actor. This individual can disseminate information faster, cheaper and fewer intermediaries.

Bonacich's Eigenvector: This measure indicates the popularity of an individual based on his / her relation to other actors who have a higher centrality in the network. Have some relationship with famous actors in the network can access valuable resources so as to reduce the time and effort.

METHODOLOGY

This study uses the saturation sampling technique to gather data. This method is particularly useful because the data were collected from all individuals along with their relationship. The advantage of this method is to allow detailed analysis of all individuals and their location in the network as well as the attributes attached to them. This method has limitations in terms of it is only used for examining small-sized organizations (Lin, N., 2001, pp15-16).

The data in this study were collected from 60 employees of Windasari batik, located in Sub-district Masaran, Sragen Regency. Windasari was chosen because it is one of big SMEs in Sragen. Table 1 show some question material contained in the questionnaire.

Table 1. Topics and content of the questionnaire questions

Topics	*Question Contents*
Communication	Who is frequently encountered;
	Frequency of meeting
	Topics of discussion
	The length of time to meet
Information	How often the information obtained
	How useful
	From whom the information was obtained
	To whom the information was given
Problem Solving	To whom to ask for help when there is a problem
	How useful assistance provided

The Results of the questionnaire were then tabulated in the form of relationship matrix and attribute matrix. Both matrixes were then inputted and analyzed by using UCINET 6 program and NetDraw. Both of these applications are developed by Borgatti, SP, Everett, MG and Freeman, L.C. 2002 at Harvard University as an Analytic Technologies.

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RESULTS AND DISCUSSION

The results of a variety of statistical measures, the centrality of individuals and their mappings in the network are described in detail in the following sections.

Density

Table 2 shows the calculation results of density using UCINET 6. There are 184 ties occur in the network as indicated by Sum. The total of ties to and from all actors is 3540 as shown by N of Obs. Average ties (density) in the network are 5.2%, which means below 50%. The significant difference between the number of ties occurred and the possibility of total ties that could occur shows that the ties between the actors in this network is weak.

Table 2. Descriptive Statistics

1	*Mean*	*0.052*
2	Std Dev	0.222
3	Sum	184.000
4	Variance	0.049
5	SSQ	184.000
6	MCSSQ	174.436
7	Euc Norm	13.565
8	Minimum	0.000
9	Maximum	1.000
10	N of Obs	3540.000
11	N Missing	0.000

Prominent Actors

Degree Centrality

Figure 1 shows the degree centrality. There are 60 actors in the network, but only a few actors are showed in this Table, especially those who have a high degree centrality. In Figure 1, the individual 13 has outdegree of 15 and indegree of 0. This suggests that this actor sends information to 15 other individuals in the network, but does not receive any information from other actors. While actor 38 has outdegree of 7 and indegree of 20, which means that, the actor gives information to seven other actors in the network, but also receives information from 20 other actors.

Combining outdegree and indegree, the actor 38 has the highest degree centrality of all other actors in the network. This actor has a good effect in terms of conveying information as well as receiving information from other actors. Therefore, this actor has a very important position in streamlining the collaboration within the network. Figure 2 shows sociogram of all actors. The Size of their symbol indicates their relative degree centrality.

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FREEMAN'S DEGREE CENTRALITY MEASURES

Diagonal valid? NO
Model: ASYMMETRIC
Input dataset: windasari sna karyawan revisi

	1 OutDegree	2 InDegree	3 NrmOutDeg	4 NrmInDeg
13	15.000	0.000	25.424	0.000
18	13.000	2.000	22.034	3.390
36	12.000	0.000	20.339	0.000
42	11.000	1.000	18.644	1.695
32	9.000	6.000	15.254	10.169
26	8.000	1.000	13.559	1.695
31	7.000	2.000	11.864	3.390
38	7.000	20.000	11.864	33.898
7	7.000	7.000	11.864	11.864
21	7.000	9.000	11.864	15.254
16	6.000	4.000	10.169	6.780
51	6.000	6.000	10.169	10.169
2	6.000	6.000	10.169	10.169
3	6.000	5.000	10.169	8.475
1	5.000	5.000	8.475	8.475
9	5.000	4.000	8.475	6.780
10	5.000	0.000	8.475	0.000
45	5.000	5.000	8.475	8.475
53	5.000	5.000	8.475	8.475
22	5.000	1.000	8.475	1.695
35	4.000	10.000	6.780	16.949
11	4.000	6.000	6.780	10.169

Figure 1. The results of degree centrality calculation

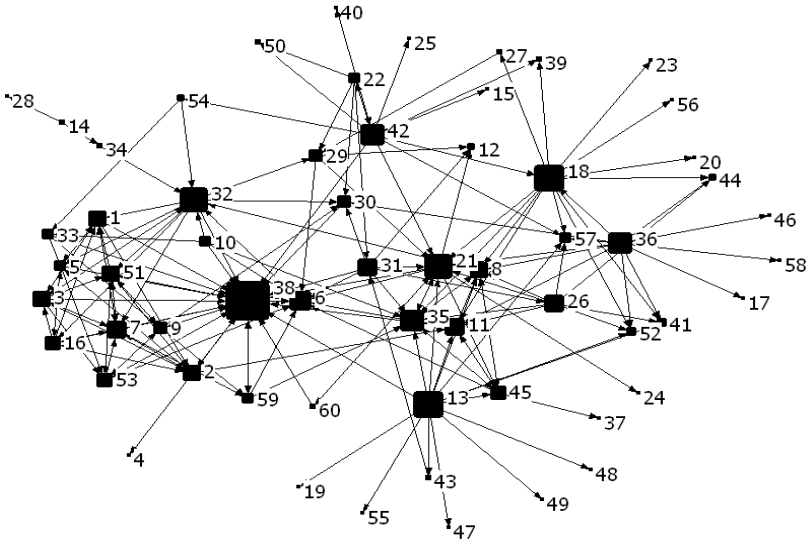

Figure 2. Sociogram of all actor based on their degree centrality

Closeness Centrality

Figure 3 shows some results of closeness centrality. Incloseness shows how close an actor from other actors in the network. Outcloseness shows how close the individual is to another actor. As shown in Figure 3, the actor 38 has the highest outcloseness and incloseness. The unsymmetrical network makes the two values different. The second position is occupied by actor 6. Their proximity position to and from other actors in the network makes the two actors are able to interact quickly with many actors.

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CLOSENESS CENTRALITY

Method: Reciprocal Geodesic Distances

Closeness Centrality Measures

	1 inCloseness	2 outCloseness	3 NinCloseness	4 NoutClosenes
38	26.667	13.833	45.198	23.446
6	20.917	9.483	35.452	16.073
35	19.283	11.833	32.684	20.056
32	18.500	15.167	31.356	25.706
51	18.250	12.683	30.932	21.497
21	18.167	14.333	30.791	24.294
2	17.500	13.583	29.661	23.023
7	17.250	13.667	29.237	23.164
53	17.167	11.933	29.096	20.226
11	16.700	12.333	28.305	20.904
9	16.667	11.917	28.249	20.198

Figure 3. Some results of closeness centrality

Betweeness Centrality

Figure 4 shows some of the calculation results betweeness centrality. As indicated in Figure 4, actor 38 has the highest betweeness centrality value, followed by actor 32 and 21. This suggests that these three actors occupy positions as intermediaries for actors to relate to other actors. These three actors have a variety of shortest paths alternative to reach other actors in submitting or receiving information. In other words, these three actors occupy favorite positions because many people depend on them to make connections to other actors.

FREEMAN BETWEENNESS CENTRALITY

	1 Betweenness	2 nBetweenness
38	233.128	6.813
32	216.365	6.323
21	149.598	4.372
35	83.196	2.431
2	76.639	2.240
29	75.876	2.217
6	61.165	1.787
59	56.658	1.656
11	52.466	1.533
31	45.333	1.325
45	44.060	1.288

Figure 4. Some results of betweeness centrality

Eigenvector Centrality

Figure 5 shows some results for eigenvector calculation. The values of the eigenvalues indicate the order from global to local dimension. The calculation produced 28 factors, but only 9 biggest factors are shown. Eigenvalues of factors 1 and 2 are not much different. This suggests that values of global dimension do not differ much from values of local dimension.

In terms of eigenvect, sorted from the highest to the the smallest value, actor 38 has the highest values, while actor 28 occupies the lowest position. This means that the actor 38 has the central position while actor 28 occupies the fairy position.

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BONACICH CENTRALITY

Method: Slow

EIGENVALUES

FACTOR	VALUE	PERCENT	CUM %	RATIO
1:	8.99335	19.8	19.8	1.326
2:	6.78363	14.9	34.7	1.599
3:	4.24334	9.3	44.1	1.174
4:	3.61419	8.0	52.0	1.161
5:	3.11350	6.9	58.9	1.177
6:	2.64488	5.8	64.7	1.065
7:	2.48407	5.5	70.2	1.168
8:	2.12683	4.7	74.8	1.171
9:	1.81588	4.0	78.8	1.154

Bonacich Eigenvector Centralities

	1 Eigenvec	2 nEigenvec
38	0.4	56.565
32	0.258	36.556
21	0.237	33.454
6	0.216	30.516
7	0.212	29.933
35	0.207	29.279
...		
...		
25	0.013	1.893
40	0.013	1.893
14	0.003	0.463
28	0	0.052

Figure 5. Some results of eigenvector centrality

Clicks in the Network

A click in the network is a group of actors who interact intensively with each other on a regular basis. The analysis produced four clicks in the Windasari SME network as showed in Table 3.

Figure 6 shows the position of four clicks in the network. Actors 2 and 7 become a member of click A and B, while the other click members occupy only a single click. The four clicks accommodate only 12 actors of 60 actors in the network. The majority of actors do not belong to any clicks. In other words, there are about 48 actors do not include in any clicks.

Table 3. Clicks of actors in network

Clicks	*Actors*
A	2,3,7
B	2,7,16
C	8, 35, 41
D	9, 38, 51, 53

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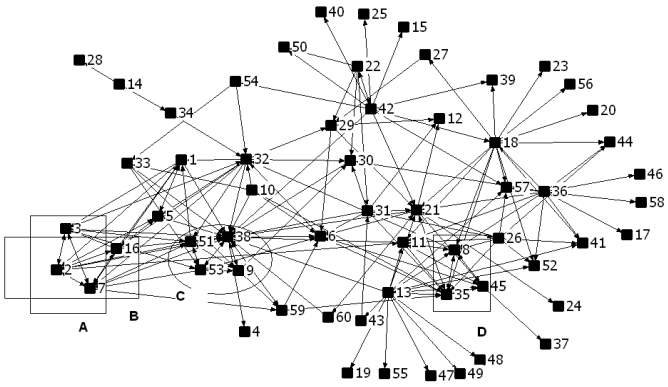

Figure 6. Four clicks in the network namely A, B, C and D

Relationships Based on Managerial Position

To see how the relationship between actors who have different positions in the Windasari SME, then all employees are classified into 4 categories namely owner, quality control manager, production manager, and employees without positions. The owner consists of husband (4), wife (6), father of the owner (35), and mother of the owner (12).The quality control manager is actor 21, and the production manager is actor 38.

Figure 7 shows the relationship between the actor positions. The owners (4.6, 12, and 35) have more contact with quality control manager (21) and production manager (38) only. Relationships with employees are run by quality control manager and production manager. In this sociogram, the relationships between actors in the same position are intentionally not shown.

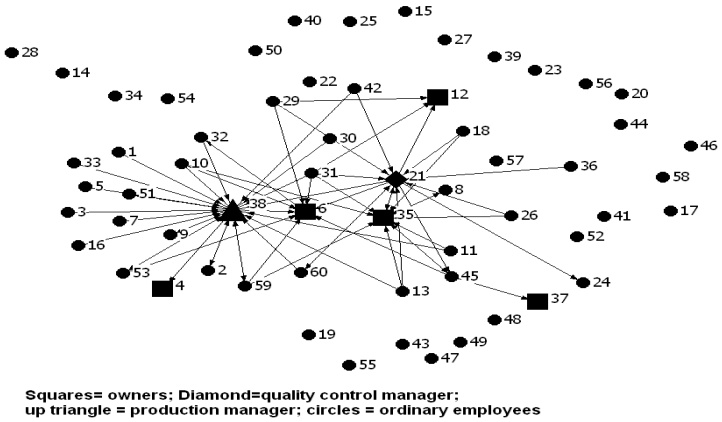

Figure 7. Actor relationships based on their managerial positions

Cross Gender Relationships

In this study the relationship between genders were also investigated. This is because there is a very clear division of labor in batik SMEs where female employees are more concentrated in batik work, while male employees are concentrated in tasks such as coloring, stamp, or dyeing. This division of labor can lead to less interaction between genders in batik SMEs.

Figure 8 shows the relationships. Boxes represent men, while circles represent women. As shown in the figure, the relationship between genders looks very minimal. Only a few actors were seen making contact outside their own gender, while other actors seem to communicate only with one another.

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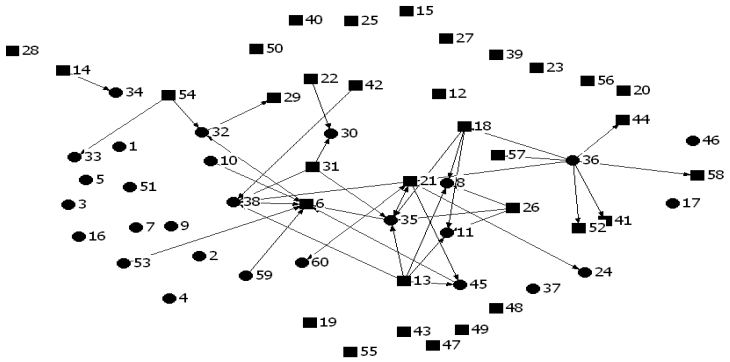

Figure 8. Cross gender relationships

Cross Section Relationships

In this study the parts of Windasari are divided into sections as shown with their symbols in Table 4. While the mapping of actor relationships within his own section or with other sections are shown in Figures 9 and 10.

Figure 9 shows the relationship of actors within their own section. As shown in the figure, their relationship is concentrated on certain factors such as 13, 18.21, 32, 38 and 42. Such actors act as brokers who distribute and receive information to and from actors connected to him.

Figure 10 shows the various patterns of actor relationships between parts in Windasari. Figure 10a shows the relationships between actors from the coloring section with the batik section. As shown, not all actors from the batik section have relationships with the coloring section. Only 10 of 39 actors in the batik section who have relationships with actors in the coloring section. Instead there were 6 of 7 actors in the coloring section have relationships with actors in the batik section. Similarly, relationships of the coloring section with the production section are shown in Figure 10b. There are only 5 actors of the production section associated with 5 actors of the coloring section.

Figure 10c shows the relationship between the showroom sections with the production section. There are two actors in the showroom section, but they are dealing only with 4 actors from the production section which has 12 actors. Similarly, the relationships of actors of the showroom section with the actors of the batik section are also very limited as shown in Figure 10d. They deal only with 6 of 39 actors in the batik section.

Figure 10e shows the relationships between the production sections with the batik section. All actors from the production section have relationships with actors in the batik section. However, only 12 of the 39 actors in the batik section who have relationships with 12 actors in the production section.

Table 4. Sections and their symbols

Sections	*Symbols*
Coloring	Triangle
Showroom	Diamond
Production	Square
Batik	Circle

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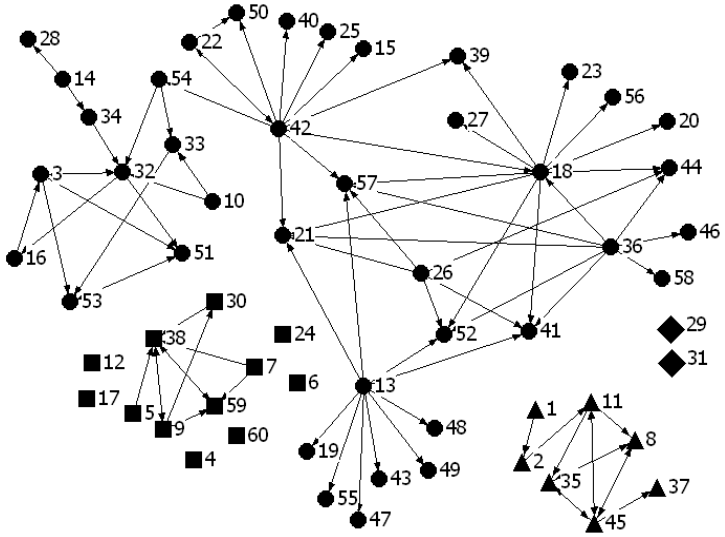

Figure 9. Relationship of actors within their own section

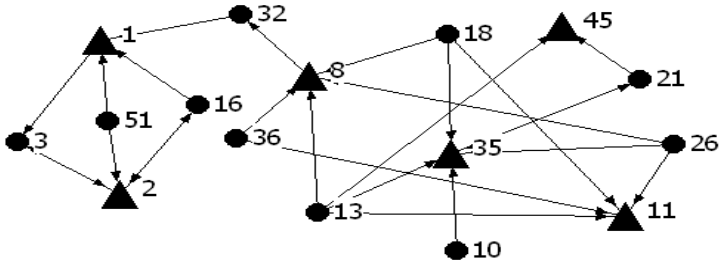

Figure 10a. Relationship of actors between coloring and batik section

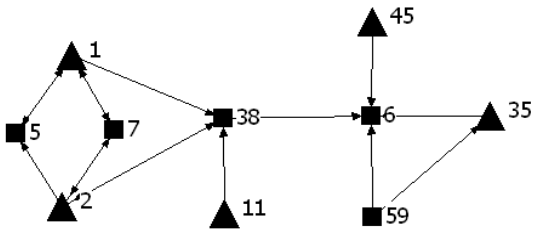

Figure 10b. Relationship of actors between coloring and production section

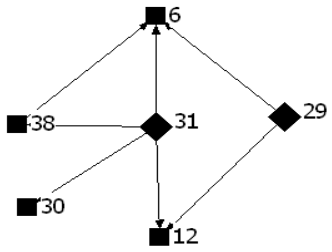

Figure 10c. Relationship of actors between showroom and production section

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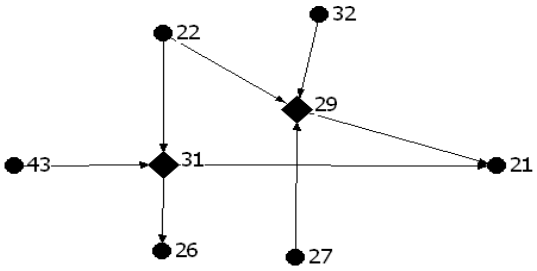

Figure 10d. Relationship of actors between showroom and batik section

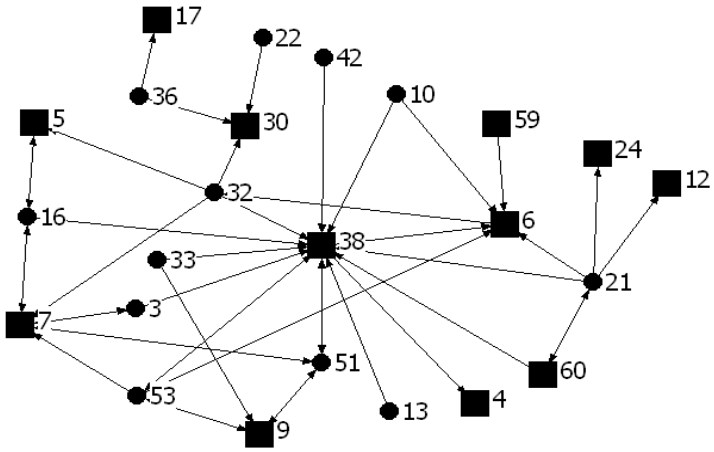

Figure 10e. Relationship of actors between production and batik section

CONCLUSION

The use of SNA strongly supports in analyzing and mapping patterns of informal interaction that are hidden and not recognized by the organization management. The analysis using SNA concludes that the ties between actors in Windasari SME are weak. Relationships of actors in this SME are highly dependent on only a few actors. The analysis found three actors who have a big role in accommodating relationships with other actors, namely 38, 32 and 12. The three actors occupy favorite positions where many actors depend to make contact with other actors. Of course this pattern of relationships is less supportive towards better collaboration.

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