The effect of network position and relationship quality on organizational performance—The ABW Family

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Abstract—The interactions among firms varied by their network positions they were influenced. Our concern is to consider the relationship among network position, relationship quality, organizational learning and organizational performance. This study analyzes the ABW Family, say Acer group, BenQ group and Wistron group, from a social network aspect. Therefore, this paper is intended as an investigation of ABW Family, and explore if interaction learning among firms of ABW Family lead to performance improvement. Results show the firms among ABW Family indeed closely and actively interact, the relationship quality influence organizational performance the most; and the “degree” is the most interpretable position variable for organizational performance.

Keywords: ABW Family, social network analysis, network position, relationship quality, organizational learning, organizational performance.

I. INTRODUCTION

The Hi-Tech industry of Taiwan develops rapidly, and obtains outstanding performance, especially for the Taiwan’s Information & Electronics Industry. In 1976, Mr. Shi Zhen-Rong founded Acer Limited Company, it became the third largest of PCs brand in the world. In 2007, The Acer Limited Company includes three big groups: Acer, BenQ and Wistron etc. (abbreviation in ABW Family). This study, taking ABW Family as an example, wants to probe whether the relationships among ABW Family possess better organizational performance than geographic cluster or industrial cluster.

Firms in a group have their individual operation objectives, so they may compete against each other in this respect. But they have been operated to focus on collaborative relationship closely in the network of industry. In short, each firm has been interacting in order to collaborate and compete inside the network. Brandenburger and Nalebuff [1] proposed the concept of co-opetition— even though firms set up collaborative relationship which continued to compete with other firms in any field. In many cases of enterprise group, firms share information and know-how to obtain benefits with competitor on one hand; and they also need to improve learning ability themselves on the other hand.

In past research, scholars used the issue of alliance to explain performance of different firms, and most of researches focus on collaboration instead discussing issues relative to the co-opetition in the group. Hence, this study wants to adopt the perspective of social network, especially with the point of view of “Core-Periphery structural analysis (includes: coreness)” and “Centrality (includes: degree, closeness, and betweenness)” to analyze the relationships among ABW Family. Briefly speaking, this paper is viewed as an investigation of connection among the Acer Group, BenQ Group, Wistron Group and Other business unit. Our study shall concentrate on the influence of relationship quality and organizational learning on organizational performance, and explore if the network position between them influence organizational performance. Besides, this study will examine the effects of network position, quality relationship and organizational learning on organizational Performance. The research questions include:

1. What do the communication networks look like for each group of ABW Family? And who are the key players in ABW Family?
2. Do network position, relationship quality, and organizational learning affect on organizational performance? Which one influence organization performance the most?
3. Which kind of network features, such as degree, closeness, betweenness and coreness, influence organizational performance the most?

II. LITERATURE REVIEW

In this section, related literatures will be reviewed, including social networks analysis, social networks extractoin and social networking for decision support.
A. Relationship Quality and Organizational Learning

Tsai [2] discusses Relationship Quality as comprising satisfaction, trust, and commitment. Commitment needs a process of mutual adaptation, for example: two organizations modulate their expectations, approaches, operations, internal processes, and/or approaches to resource allocation to reflect one another’s needs, characteristics, and requirements. The process of adaptation to organizational learning and ongoing knowledge development is positive. Thus, the hypothesis is:

H1: Relationship Quality will influence Organizational Learning.

B. Organizational Learning and Organizational Performance

Generally speaking, organizational learning is important for organization’s survival and effective performance [3][4][5][6]. Many scholars point out organization developed resource-based hypotheses and showed a positive relationship between internal/external learning and organizational performance. Organization maintains the knowledge accumulation, generation and application could be the source of a superior organizational performance, demonstrating the positive relationships between knowledge flows and stocks and organizational performance [7] Thus, we hypothesize:

H2: Organizational Learning will influence Organizational performance.

C. Relationship Quality and Organizational Performance

Relationship Quality and customer satisfaction are positively related to organizational performance, and relationship quality is an important variable to forecast organizational performance (Lee and Kim, 1999). Cheng and Jen [8] raised the organizational efficiency of relationship quality and competitive benefit, image benefit, whole benefit and cooperation satisfaction have a positive effect on organizational performance. Relationship quality has a positive effect on customers and enterprise interaction in the future (Crosby, Evans & Cowles, 1990). Thus, we hypothesize:

H3: Relationship quality will influence Organizational performance.

D. Network Position and Organizational Performance

Core firms possessed the most resources, technique, cost of time, cost of search etc. than periphery firms. Burt (1992) argued that organization located on core position to gain benefits of information and benefits of control which was helped organizational growth. Therefore, once organization have create and possess a high center network position, they can gain superior benefits. Thus, we hypothesize:

H4: Network position will influence Organizational performance.

III. METHODOLOGY

According to the research background and motivation of this paper, we have designed a system architecture to addressed the raised issues. The system will allowed us to collect social data from different sources, such as e-mail, instant messenger and blog. The multi-source social data will then be pre-process and analyze. The processed data then can be used to extract social networks automatically and dynamically. The system then can be further developed to a decision support system. However, this paper will not focus on the decision support system and only the methodology to collect multi-source social data, pre-processing and how to integrate the data for generating social networks, which is the main contribution of this paper. The architecture of the social network extraction system is presented in figure 1.

Figure 1: Study structure

The questionnaire consists of five parts. In the first part, the research measures the extent of firms’ relationship quality which constitutes mutual benefit, trust, and commitment within the ABW Family. The second part is organizational learning that assesses each firm’s learning situation. This part was formed by four sub-constructs: knowledge acquisition, knowledge distribution, knowledge interpretation, organizational memory. The third part is to measures the communication network within ABW Family. Three types of relationship arranged in questionnaire are buyer/supplier, competitor, and other. Three kinds of relationships were designed to analyze communication network and communication frequency with other firms. For considering the business secret is not easy to explore, respondents were requested to pick one from a scale list of financial performance over the past five years in the fourth part. And the final part is about the firms’ basic information. Except from the part of organizational performance and basic information, the rest of questionnaire were asked from a scale ranging from 1 to 7, where 1 refers to the lowest score in the measure and 7 means the highest.

Our firm list was obtained from Acer, BenQ, Wistron’s Website, and relative references. The author double check the firm list and found that some firms do not exist anymore. Totally 40 firms were gathered in the list of our research to the last. All of the companies were contacted in the first round through personal phone-call, fax, and e-mail. Perhaps someone will challenge the sample is too small to represent the population. However, research on the so-called “Small World”
stated that ties of acquaintanceship link us to nearly every human being on the earth in six steps, so the network finally contains the world population. If research proceeds to study the entire world, the network will too large to be carried out \([9]\). Besides, this study adopts the “whole network” approach which a “closed group” is needed and a “convenient sampling” is applied. In this regard, the ABW Family completely can be called a “whole network”. In this research, the network software UCINET 6.182 was applied to analyze the network position which includes degree, closeness, betweenness centrality and coreness. Besides, regression analysis were examined to identify five hypotheses. Then, SPSS statistical software was used to conduct statistic analysis.

IV. Social Network Analysis

Regarding sample characteristics, 83.75% of the firms have capitalizations of fewer than 5 billion, 62.15% have ages of less than 12 year, and 35.14% have stafs of greater than 1000. Obviously, most firms are characterized by the younger, OEM/ODM and SMEs, As for the reliability, cronbach’s \(\alpha\) of measure in this research are all greater than 0.7, and the validity measure of three main construct were based on scholars’ research, the content validity should be established.

A. Social Network Analysis

1) Acer group’s Communication Network (ACN)

Whatever degree centrality, closeness centrality, betweenness centrality or coreness, the research shown that firm A-1, A-7 and A-6 is the key players in Acer group. They possessed resources and assistances which came from the Acer group and easily obtained information and know-how as well. Therefore, most firms collaborate with them. Besides, all subsidiaries of Acer group communicate information and know-hows with other firms via A-1, A-7 and A-6. As the research shows that most firms could reach other firms in three or four steps. My interpretation of the research is that ACN firms’ relationships are quite close, which may have a positive impact on communication efficiency and business performance.

2) BenQ group Communication Network (BCN)

The measure of degree centrality, closeness centrality, betweenness centrality or coreness, it shows that firm of B-12 and B-4 are the most important core firms in BenQ group. We may say that these key firms act as a leader to guide ABW Family to obtain a better organizational performance. Same as in the ACN network, most firms in BCN network could reach other firms in three or four steps.

3) Wistron group Communication Network (WCN)

Regarding the test of degree centrality, closeness centrality, betweenness centrality or coreness, it indicates that firm of W-1 and W-6 are the key players in Wistron group. These actors with better position will bring themselves to access more information and knowledge. All firms almost could reach other firms in three steps. Wistron Corporation focused on supplying ICT products and services lead its subsidiaries companies to the worldwide companies.

4) Other Business Unit Communication Network (WABWCN)

Whatever the degree centrality, closeness centrality, betweenness centrality or coreness, it indicates that firm O-8, O-6 and O-9 are the core firms in OCN and others remain are periphery. We may say that these key firms interact closely and then exchange important information and knowledge each other. For each firm in OCN, they could reach other firms in three steps.

5) The whole ABW Family Collaborative Network (WABWCN)

In this part, we shall discuss ABW Family Collaborative Network in detail. The red node indicates Acer Group, blue node indicates BenQ Group, green node indicates Wistron Group, and gray node indicates other firms of business unit. As for the degree centrality, closeness centrality, betweenness centrality, it indicates that A-1, A-6, A-7, A-10, B-4, B-12, O-8, O-9 and W-1 are located in the core position; other firms of ABW are almost in the periphery. While vertical integration was commonly observed in the past, disintegration has become a trend recently. At the end of 2000, Acer announced that they would divide group into three groups, which are Acer group, BenQ group, and Wistron group respectively. BenQ is striving to find brand themselves, Wistron focuses on ODM/OEM. Each group of ABW Family is striving in their fields. Hence, we may say that they would divide field into “OBM” and “ODM/OEM”. So, these firms will have co-opetition in this network, they will communicate more often in the future.
V. TEST OF HYPOTHESES

Pearson Correlation Analysis was examined the relationships among these three groups and whole network, relationship quality, and organizational performance respectively; then, the correlations among relationship quality, organizational learning, and performance were examined and shown significantly positive correlations among each dimension.

This paper attempts to adopt linear regression and hierarchical regression which was examined the fourth hypotheses (refer to Table 1-7).

Table 1: Regression analysis between Relationship Quality and Organizational Learning

<table>
<thead>
<tr>
<th>Network Position</th>
<th>Organizational Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cons.</td>
<td></td>
</tr>
<tr>
<td>Relationship Quality</td>
<td>0.782</td>
</tr>
<tr>
<td></td>
<td>2.137</td>
</tr>
</tbody>
</table>

Note: *p<0.1, **p<0.05, ***p<0.01

Table 2: Regression analysis between organizational learning and Organizational Performance

<table>
<thead>
<tr>
<th>Network Position</th>
<th>Organizational Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cons.</td>
<td></td>
</tr>
<tr>
<td>Degree</td>
<td>0.927</td>
</tr>
<tr>
<td></td>
<td>0.591</td>
</tr>
</tbody>
</table>

Note: *p<0.1, **p<0.05, ***p<0.01

We arrive at the conclusion that the investigated network position, relationship quality, organizational learning and organizational performance among ABW Family from a social network theory perspective shown that only degree centrality influence organizational performance the most among the four independent variables (degree, closeness, betweenness and coreness). The hypotheses of H1, H2 and H3 are fully supported and the hypothesis H4 is partially support.

VI. FINDINGS AND SUGGESTIONS

We found that each firm is a unit of self-sufficiency in group. For responding the fast and change environment, most firms thus separated into groups in order to enhance network position within ABW Family. Generally speaking, firms compete with other firms, firms share know-how with competitor and don’t reduce benefits, on the contrary, firms can obtain more benefits and improve their abilities for themselves.
From the viewpoint of “Core-Periphery”, ABW Family is a dense cluster, which can be divided into two types: core firms and periphery firms. The above study indicates many players keep close relationships with Acer group, BenQ group, Wistron group and Other business unit. Moreover, these key players share information, knowledge, technology and norms each other. However, it is worth noting that few newly firms’ with high performances are not a key player. This is because those firms have been focusing on producing high value added software and computer equipment and on using network to reduce operational cost.

From the verifying result of Hypotheses 1, it indicated network position (only betweenness and closeness are significant, direct tie is not) partially influences the relationship quality. We may say that an actor with betweenness and closeness centrality is easy to build better relationship quality and obtain information, and is able to internalize it for their use. It means that a few key firms acted as a bridge can easily obtain information and even diverse knowledge. The result indicated that the relationship between network position and relationship quality in Wistron Group was found no significant. This is because firms in Wistron Group engaged in OEM/ODM, and most of clients come from Europe and American’s factories or other two groups. The firms in Wistron Group are highly homogeneous in nature. Therefore, there is no significant between network position and relationship quality.

We speculated that firms in ABW Family might acquire know-how fast and easily. In this vein, relationship quality has significantly positive influence on knowledge acquisition, knowledge distribution, knowledge interpretation and organizational memory. We may, therefore, reasonably conclude that actors adopt mutual benefit, trust and commitment to help forward organizational learning. Most firms within ABW Family trust each other and have common commitments. Moreover, relationship quality has better explanation on organizational performance. The authors noticed that some of firms’ coreness is low, but their performance is high. This probably because of each firm was independent and specialization in their field and each firm spent less time on communication with other firms in ABW Family. This lead to coreness hasn’t significantly influence on organizational performance.

The result shows relationship quality has better explanation on organizational performance. Because of every firm acquire comrades’ high trust and common commitment, regardless of what kinds of relationship they have; they will enhance organizational performance by way of relationship quality. The above study pointed out that degree has significantly positive influence on organizational performance. We speculated that these key firms interact closely and exchange important information and know-how hold by them; hence they have better organizational performance. The results suggest that the most interpretable network position variables in ABW Family are betweenness and closeness, This study also has several managerial implications based on the empirical results. Most firms locate core position to obtain the maximum benefits, namely, firm must occupy the great position to obtain competitive advantage. From the results of regression indicated a significant of organizational performance for betweenness and closeness, and supported conception of structural holes. This study adopted the multilevel network analysis to exploit how the different groups of the social network structures affect the actions the firms take. So as to replenish past many scholars adopted single dimension to analyze network structure.

The generalization of the study results is limited because it is just the case of ABW Family and the business operational strategies varied firms by firms. Future research could extend network scope. In other words, the scope may includes all the value chain of ABW Family and theirs customer.

REFERENCES