

Social Network and Resources Integration Within Logistics Industry in China

—With Case Study of Cainiao Network

Qiming Sun^{1,a,*}

¹Middlesex University London, The Burroughs, Hendon, London, NW4 4BT, United Kingdom
a. QS046@live.mdx.ac.uk

*corresponding author

Abstract: The business network in logistics industry is essential for integrating resources and establish firms' own advantage of competitiveness in the market, as well as providing more comprehensive services that facilitate firms to gain its revenue. Construction of intermediary platforms has therefore been an effective mean. Cainiao, a subdivided branch of Chinese giant enterprise Alibaba, has seized this opportunity. Though the debate about how social networks function to boost the high-quality development of firms has been very hot over the last three decades, few studies have mentioned and worked to understand to the linkage between social network analysis (SNA) and logistics chain management. Hence, the purpose of this research is to identify the construction of a business network by the giant Chinese logistics companies and its enhancing function of collaboration among firms and embeddedness for the success of Cainiao, which constructs the whole network. This paper will be carried out in concept explanation of essential terms in SNA and the practice of them into operation of Cainiao Network, as well as some diagrams made by Ucinet software will be applied. Results of the study show that through the early alliance of giant express enterprises, Cainiao has gained a wide network map that permits it to utilize abundant resources for the firm's prosperity, and boosts the conjunction between the other companies and customers.

Keywords: SNA, ego network, structure hole, centrality, social capital, logistic management

1. Introduction

Social network has been a much arguable topic over the last three decades. In modern society, institutions and business organizations exert tighter and more intensive mutual relationships in forms of collaboration and competition owing to the function of the market. Organizations, especially logistics firms, are attempting to share resources with their competitors. The aim of this paper is to examine how logistics firms establish platforms for resource concordance and integration, as well as acting as an intermediary for the purpose of connecting express companies together as a whole. The research will be carried out with a conceptualized explanation of vocabulary and linkage with the Cainiao Network, followed by an illustration of how the business network in Cainiao operates with the application of the Ucinet diagrams [1]. Many predecessors who specialized in the investigation of social networks in relation to business and their application in real business operations have provided

their understanding and findings, which thereby offering much useful prior experience and data that facilitate the research in this paper. However, there are few researchers who have set foot in the in-depth investigation of the close interlinkage within logistics firms and how these company form platforms to plan and utilize the resources. Therefore, some deeper discussions will be discussed and viewed in this paper to replenish the gap.

2. Situation and Problems of Logistics in China Before 2013

Though the introduction of a new type of e-commerce platform, Taobao, exerted great market demand, China's logistics and express industries kept developing in depressed circumstances for a long time before 2013. The recession occurred in many aspects of the business.

First, according to the data published by the International Cooperation Department of China Federation of Logistics & Purchasing [2], the growth of the total value of social logistics witnessed a downtrend in the period before 2013, especially for the statistics of 2012, at a year-on-year growth rate of 9.8%, falling 2.5% compared with the data in 2011. In addition to this, it happened in a similar situation for the figure of the overall cost of national social logistic, valued at 9.4 trillion with an 11.4% year-on-year growth rate, 7.1% less than that of 2011 [2].

Second, compared with western nations, the Chinese express companies appeared to have a tremendous gap still in terms of the facilities equipped, scale, personnel management, cohesion of the transportation of resources, and many other aspects. This might primarily point to the underlying reasons why those logistics firms were still operating in a rudimentary phrase in the newly formed market. With people catching the foreseeable development potential of e-commerce market, they seized this valuable chance and thousands of logistics firms are established, where majority of them were in a small scale and initiated with low amount of capital [3]. More importantly, as a junior industry, a prominent standard that can assess the financial behavior of firms was lacking, leading to chaos in management in all industries. This has caused frequent poor operational behaviors, including violently sorting packages, low timeliness of delivery, and other significant problems, which may generate poor reputations from customers.

Third, low level of mechanization, according to Xiexiebang [3], was also a common phenomenon for most private express companies in that period. Again, since it was still in the first phase of logistics development, the limitation of technology factor had exerted an obstacle in the path to advanced development of the firms. Many of them still use manual labor force in the logistics process, including packaging, sorting, loading & unloading, and delivering the parcels, which indeed created a visible gap between the domestic firms and foreign giants, who generally applied automatic equipment in the standardized processes.

Lastly, as mentioned above, since majority of the Chinese express were formed and operated with small startup capital, encountering issues like "capital bottleneck" was at a high risk. Except for leading firms that could issue bonds and stock to raise capital, small-scale enterprises tended to operate on their own cash and deposits, which therefore enlarged the risk of capital chain rupture leading to potential bankruptcies. The other and remaining mean of financing is to apply loan from bank. However, banks and other financial institutions might be cautious about issuing the loans to these firms, not to refuse the stimulation of the development of the private economy, but because they are uncertain whether they can get the fund and a reasonable return back. In this case, the private express enterprises might be restricted from further development for future prospects.

3. Initial Formation History and Logistics Mode of Cainiao Network

Cainiao is a logistic data platform that “promotes and digital upgrade of the express industry” and succeeded from innovative technology, resource intergration, as well as cooperation with the leading courier firms [4]. How Cainiao Network developed is worth to be discussed.

Formation of the Cainiao Network: As portrayed in the above situation related to the overall environment of the express industry, it had indeed generated the latter issues. To illustrate, the entire industry lacked of an unified criteria and system for management. Other problems include, the high cost of the logistic process, low efficiency and service quality caused by uneven personnel quality level, which combined and thereby led to the inability to form a scale economy effect [5]. Deriving from these conditions, Jack Ma, one of the founders of Alibaba, made a precise and forward-looking prediction of the future prospects of the Chinese express industry, caught the opportunity, and collaborated with Chinese giant logistics firms (ZTO, STO, YTO, SF, and Yunda), to construct a logistic data sharing and management platform that pooled socialized capital and advanced capabilities together so that it could provide e-commerce retailers with more efficient and cost-effective services[4] [6] [7].

Dedicated to the realization of the company mission of “24-hour nationwide, 72-hour worldwide delivery”, Cainiao has invested vast amount of capital and vigor in the purpose of developing the biggest and most advanced information technology. In this process, there was no lack of application of technologies including big data, cloud computing, and smart equipment that permit customers to precisely track the real-time whereabouts of each parcels, while accurately doing data analysis and allocating logistics resources to facilitate the operation of parcel express firms. Cainiao Yizhan service points and the Cainiao Guoguo APP are also developed and distributed to the majority of regions in China. The app allows one-click delivery, door-to-door mailing, as well as changing or refunding parcels, promoting the convenience for customers to do express transactions. For special shopping festivals like Double Eleven, Cainiao will help merchants do the customer preference analysis, separate the warehouse, and predict the optimal cargo transport route, helping the express firms to allocate resources, and thereby increase the overall operation efficiency. Furthermore, with the increased establishments and wider coverage of logistics infrastructures, as well as the five massive large-scale storage centers distributed across several metropolises, the network connected all of its resources and integrated them with the support of information technology, reducing delivery time and accelerating industrial structure upgrading [8].

4. A Closer Look at Cainiao Network in Terms of Social Network Analysis

Social network analysis (SNA), is a theory deriving from sociology and communication science that examines the relationships between people, and between organizations [9]. Fuks et al. also pointed out that this method is also eligible for the examination of the weight of certain groups of people in common phenomenon in human society [10]. Each entity or individual is conceptualized as a node and connected with others with ties. The strength of the tie will be analyzed and measured using a mathematical method to provide a clear illustration of how the social network of a person or group performs. The measurement of SNA in this paper will focus on the ego network, structure hole, and betweenness centrality of the business network constructed by Cainiao and its partner express firms, based on the figures provided below. The concepts of each term will be explained.

4.1. Ego Network

Ego network refers to the social relationship structure that the object individuals are centralized as a core node and its surrounded neighbors(alter) link to the center respectively. The more ties with its alter, the better its centrality is. In the Figure 1, it is obvious to obtain the situation that Cainiao Network has

the most number of conjunctions with other express companies, where a direct relation can be found in relationships between every neighbor and the centralized individual, thereby promoting the Cainiao Network to become the most centralized center. Compared with other companies like ZTO, STO, YTO, and YUNDA, which just have little access to all of the resources within those firms but are merely their neighbors, Cainiao can easily get access and pool the resources for its use.

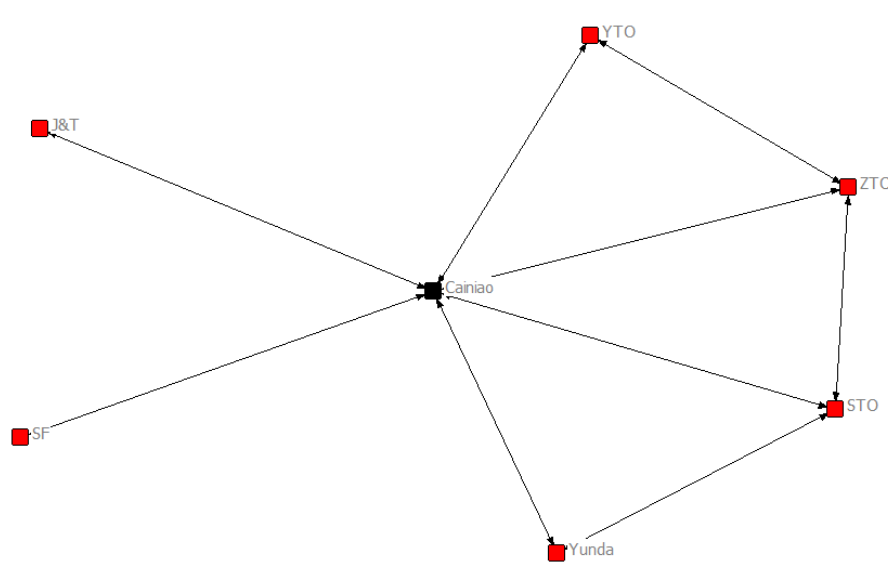


Figure 1: Ego network of Cainiao [1].

4.2. Structure Hole

Labun & Wittek interpreted that a structure hole is the gap between the relationship of two actors in an individual's network [11]. People or institutions with structure hole existed in between exerted bodiless obstacles for mutually accessing the resources of each other. This is the cause where a broker emerges and occupies the hole and make conjunctions for both sides, and in turn the broker can obtain the advantage of more social capital and integrate resources for its own prosperous development. As Figure 2 obtained from Lee & Kim shows, the number of structure holes decreases as more interactions and connections emerge between two parties, and it produces more opportunity for the brokers to join in [12]. Back to the evaluation of Cainiao, according to Figure 1, the collaborative relationships among its partner firms reveal that they communicate in a narrow scope, where the firms merely cooperate with their nearest neighbors and rarely have access to the resources of other firms. For example, if Yunda attempts to form formal collaboration with J&T by mutually developing an advanced transshipment centre with the purpose of strengthening their efficiency of transferring parcels, they cannot easily realize it owing to the potential high R&D cost and inaccessibility of mutual resources. The establishment of Cainiao can then function as a broker occupying the structure hole and facilitate the cooperation of these two companies.

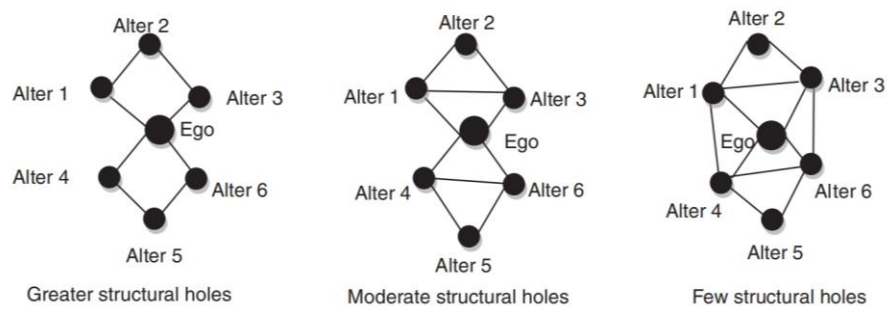


Figure 2: Three types of structure holes [12].

4.3. Betweenness Network

From Fuks et al., “betweenness network” is a neutrality measurement that examines the “number of the shortest paths between any two nodes passing through the given nodes to the total number of all shortest paths.” [10]. The more linkage paths intersect at a node, which implies more significance and a higher level of betweenness. As revealed in Figures 1&3, Cainiao has 11 shortest paths that pass through it, and the centrality index is so high that it reached 72.22% [1]. This indeed implies it is the node with the highest level of betweenness, suggesting the essential function as intermediary platform boosting the ties and collaboration between any parties.

Un-normalized centralization: 65.000			
		1	2
		Betweenness	nBetweenness
4	Cainiao	11.000	73.333
2	STO	0.500	3.333
1	ZTO	0.500	3.333
3	YTO	0.000	0.000
5	Yunda	0.000	0.000
6	SF	0.000	0.000
7	J&T	0.000	0.000
DESCRIPTIVE STATISTICS FOR EACH MEASURE			
		1	2
		Betweenness	nBetweenness
1	Mean	1.714	11.429
2	Std Dev	3.797	25.314
3	Sum	12.000	80.000
4	Variance	14.418	640.816
5	SSQ	121.500	5400.000
6	MCSSQ	100.929	4485.715
7	Euc Norm	11.023	73.485
8	Minimum	0.000	0.000
9	Maximum	11.000	73.333
Network Centralization Index = 72.22%			

Figure 3: Betweenness centrality evaluation of Cainiao network [1].

5. Enlightenment Obtained from the Case of Cainiao Network

The establishment of the Cainiao Network here introduces a term that has been rarely discussed in academic world: collaborative logistics networks (CLNs). CLN operates by joining the platform cosntructor and logistics firms together for sharing mutual resources, both online and offline. That is to say, the broker utilizes the information to reduce the possibility of information asymmetry and improve overall customer satisfaction and brand loyalty [4].

The construction of CLN can produce three aspects of advantage for Cainiao and its collaborative partners. First, the transportation and operation costs can be reduced [4] [13]. For the logistic systems with low application of various means of transportation for delivery, a much higher social cost and operation cost will generate and cause a high economic burden to these logistic firms, contrasted to those collaborative logistics platforms who have accessibility to the transportation resources from partners, which allows the platform to precisely allocate distict transportation channels that are cost-effective for efficient operation, including trains, trucks, shipment, and airports [13]. The second advantage is that the incidence of operations and capital risks can be lowered. Since the Collaborative Logistics Platforms were established by connecting several giant express firms that indeed have sufficient capital in hand, the risk of a broken capital chain would be reduced and distributed to its partner firms, ensuring the sustainable operation ability of Cainiao [6]. Lastly, the operation performance can be improved through the logistics platforms. Lyu et al. portray their argument that the platform can attract other newcomers with strong power and social capital to join the cooperative relationship [8]. Through the cooperation, the firms can develop their systems to a higher quality, allowing them to “manage their environmental uncertainties and enhance their peformance” [8].

6. Conclusion

To sum up, the majority of the giant firms in the Chinese logistics industry are intensively connected owing to the contribution of Cainiao in establishing platforms that function as intermediaries for sharing resources and linking express firms with customers, thereby lowering the transaction cost. According to the alliance, Cainiao has also harvested abundant resources and enlarged its social capital, which has increased its transaction volume and helped it win good reputation from the market; meanwhile, it is permitted to obtain more informational advantages and dominance preponderances.

Nevertheless, there is some deficiency in this research. One significant point is that some of the sources of information applied have a narrow view, that might not be able to well support the argument due to the fact that few researchers have done research on this topic. Moreover, the data used for making ucinet diagrams did not consider the variation factor that how the express companies mentioned link to each other in addition to the direct relationship between Cainiao and them. These can be tackled in the future by studying related knowledge to a deeper degree and seeking out more sources that are suitable to be utilized as references to verify the arguments and discussion mentioned in the paper.

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