Chapter 67
Building and Analyzing of Enterprise Network: A Case Study on China Automobile Supply Network

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ABSTRACT

Social business moves beyond linear, process-driven organizations to create new, dynamic, networked businesses that focus on customer value. Enterprise network (EN) is used to support social business by maximizing current and future opportunities and facilitate network-enabled processes, which can lead to value co-creation. EN is a multi-level hypergraph model with enterprises, employees, products and other related entities. In this paper the authors refine the EN model and present the foundation of EN to support social businesses. Then they introduce a case study on China automobile supply network (CASN). For the similarity with social networks, they verify power-law and small world theories in EN with statistical results on this data set. These theories are fitful in EN, but some new characteristics exist. The structure of EN consists of star-shaped clusters and the authors extract ego networks taking suppliers and manufacturers as the ego respectively. With the structure and distribution features of EN, they present the enterprise business similarity analysis method based on common-neighbors. And they also introduce the tentative work to detect Dunbar circles in EN. To analyze the data in a more intuitional and effective way, the authors use some data visualization tools to process the data in EN.

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1. INTRODUCTION

Social business refers to that organizations consciously use social tools, social media and social networking, prepensely integrate Web2.0 technology and Internet space to rebuild the communication channel to consumers and change the way of organization management and business operation. The next generation of market-leading organizations will digitize their enterprise model with new capabilities enabled by social technologies. Social business answers to the major technological and economic shifts that define innovation today. Social ways of working harness the explosive growth of mobile, cloud and Big Data, and serve as the foundation for effective employee and customer engagement. As of September 2013, there are 14,693,100 enterprises in China, which is really a huge potential space for social business. The key to realize social business is the comprehensive utilization of social information, which apparently is in large quantity and diversified. Instantaneity in social business is critical for the enterprise to maximize its value to the business.

Due to the consideration of privacy and security, most enterprises are not willing to use public online social networks (OSNs). Therefore, enterprise social network (ESN) emerges and grows quickly, and new types of software based on ESN have come out, e.g., Salesforce's Chatter, Microsoft's Yammer and IBM Connections. This kind of software provides convenience for collaboration and communication among employees and enterprises in premise condition of the guarantee of privacy and security. But in these applications ESN is confined to communication among people while ignoring the business which is the core factor of enterprise relationships. Hence, we proposed a new EN model, in which we built the network of enterprise relationships regarding the enterprise as the core entity and the business between enterprises as the principal line (Liqiang, Xiangxu et al. 2014). The EN model is expressed by weighted directed graphs and hypergraphs, and consists of four graphs, the enterprises graph (ENTG), the employees graph (EMPG), the products graph (PROG) and the three-level hypergraph (TLHG). The comprehensive utilization of these graphs can link the main entities in the business together, such as enterprises, business, employees, products and etc. Our proposed EN model has broad application prospects. For the similarity with social networks, many algorithms and methods in social network analysis (SNA) can be applied in EN.

Enterprise Relationship Management (ERM) is basically a business strategy based on the leverage of network-enabled processes and activities to transform the relationships between the organization and all its internal and external constituencies in order to maximize current and future opportunities ("Enterprise relationship management," 2014).In social business, ERM is a critical entry point to understand the relationships clearly. We hold the opinion that ERM is made up of supplier relationship management (SRM), customer relationship management (CRM), product relationship management (PRM) and human relationship management (HRM).

EN is built to support social business. EN is more massive and comprehensive than other traditional enterprise network models. We can comprehensively utilize the EN information to handle the strong relationships, find the weak relationships, and finally support social business. Data visualization is an important tool to show data in an intuitional way and mine the implicit valuable data. We present some visualization tools in EN according to different data features.

The remainder of this paper is organized as follows. In section 2, we introduce the related work which is the results of other people mainly about the theory and analysis of social network and Big Data. We refine the EN model, and provide ways to build the relationships in section 3. In section 4 we illustrate how EN acts as the foundation of social business, and take some visualization tools to show the data