

Advantages and challenges of Digital information at the intersection of Social networks and Enterprise Social Networks and Supply Chain Management

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Abstract. The present paper aims to improve the way in which opportunities and challenges of SN systems are grasped in organizational context in order to share knowledge within and out of the organization, while enhancing their influence staff productivity. Organizations have to go beyond their boundaries to obtain the required skills and technologies for their survival in the contemporary competitive context. Among these, supply chain management and social networks can be mentioned as two prevalent concepts. Different studies have been performed on supply chain management (SCM); however, the role of social networks in enhancing the use of information in supply chains has been almost neglected. The present study aims to investigate the probable effects of social networks on the use of information in organizational and supply chain contexts consequently have a contribution to the theoretical development. Understanding of the opportunities and problems resulted from the application of SN in SCM is facilitated through this exploratory study. Information, used in the present study, was collected from different text books and articles along with several companies and a variety of valid references.

Introduction

Companies face the question that if social networking is of significant value and importance or just would waste their time, since there is some evidence on their successful application as well as their possible risks and restrictions. Social networking is undoubtedly accompanied with both challenges and opportunities; therefore, companies which want to employ this kind of networking have to evaluate the two sides and identify the effects they may have on organizational performance. The primary opportunities and the probable risks of social networking are investigated in the present paper, while the fit-viability model is used to supply the companies, which want to adopt this novel technology with the required instructions [1].

Public or private organizations can obtain social capital through social networking, while it can also play a significant role in motivating business effectiveness and efficiency toward attainment of competitive advantages. Although it has been currently understood how knowledge management is basically developed by ESN, a considerable distance is still observed between the perceived capacity of ESN platforms and their real application in the business environment because of inadequate participation as well as user opposition [2].



The present study aims to discover:

- The effects of SN on the consistency and application of information at organizational and supply chain levels
- The effect of supply chain as well as information consistency on the reduction of waste in some areas

Research background and literature review

1.1 Supply Chain

Supply chains are obviously more at the centre of attention compared to the single industries in the universal market competitions. The role of efficient and consistent management is more significantly perceived when business justifications are accompanied by binding safety limitations for the security of the end users. Businesses have been increasingly globalized during the past two decades because of fast growing technologies in the area of production and information, along with higher costs and more challenging customer demands [1]. Considerable changes are accordingly observed in the conventional production – distribution plans. Relocation or redesign of the production networks has been inevitable for many companies across the world [3].

Suppliers, manufacturers, retail sellers, and other associated groups are replacing their traditional free market schemes with the modern partnership associations. When there is a relationship between two or several independent or dependent parties in the supply channels, a supply chain partnership is created. Subsequently, higher levels of information are shared so that the desired goals and targets of reducing total expenditures and inventories can be achieved [4].

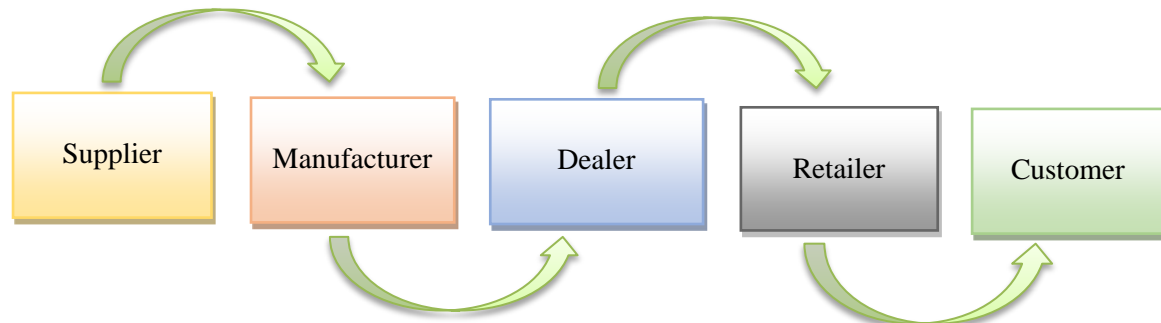


Figure 1. Supply Chain Management Structure [2]

1.2 Social Networks

Higher quality along with more flexibility is required in addition to reduction of costs in the contemporary dynamic business context, so that organizations can improve their performance as well as competitive advantages and consequently survive. In this regard, exact and critical information has to be available inside and out of the organizations, while its effective application is also of vital importance. In other words, proper utilization of information technology tools plays a significant role in achieving the desired competitive advantages and maintaining them.[5]

Two major directions can be observed in the related literature, the first of which examines the benefits of public social networks as well as enterprise social networks in addressing different challenges that organizations may experience. The second one looks at the effect of the above mentioned networks on cooperation within the organization and the communication among the partners.

Organizational decision-making at different levels of strategies, tactics, and operations can be influenced by its information. The contribution of communication has been examined in the present study in association with voluntary SNs application [6]. Accordingly, the drivers of continuous staff participation are generally understood.

1.3 Social Media vs. Social Networks

It is almost difficult to provide an exact definition of social media, which makes mutual communication possible for the users. Despite social media which is considered as a strategy and a broadcasting tool, social networks make connections with others possible. Social media and social network are, indeed, different from several aspects. First of all, social media is defined as a media initially applied for transmission or share of information with a wide range of audience; however, social network includes involvement of different people with shared interests, who start communication across the society. Moreover, these two use different styles to communicate. Social media is actually considered as a system or a channel to communicate, while social network provides mutual communication, in which conversations play the central role and relationships are advanced through them [7].

Communication is considerably facilitated by the implementation of social media among organizational staff. Familiarity with the way communication is enabled or constrained by social media is of critical importance, since the business is run through these dynamic activities that are essential for organizational performance and survival. Appropriate and enough information is necessary to manage the supply chain effectively, similar to other areas of business management. Organizations should be able to monitor and understand the business context if they want to obtain and increase this kind of information. Researchers have started to perceive the importance of social media in environmental scanning (ES) procedures and observe its effects on business performance. Organizations can promote their brand experience through employment of social media, which will subsequently facilitate their brand building and provide them with a favourable brand image [7].

2. 4 Environment Scanning

Environmental Scanning (ES) includes the attainment and application of information related to the events, procedures, and associations with the external organizational context. This information helps managers to plan the future functions of the organizations. In other words, environmental scanning is of vital importance in connecting the existing context (including customers, suppliers, partners, and so on) with operational and strategic decision-making aspects, so that the business can be accommodated to the desired context. Implementation of the routine tasks and decision-making are dependent on the information and knowledge previously obtained by the organization, while there is the potential of neglecting new conditions which are out of their direct control. ES can be considered essential for organizational learning, and it also facilitates the identification of the events and procedures that should be probably dealt with across the organization [8].

Organizations are experiencing a significant amount of information overload along with more sophisticated and uncertain contexts in today's increasingly competitive world with the rapid growth of IT innovative technologies. Supply chain managers can use social media to collect the required information from a wide range of sources. Moreover, specific organizations or their partners can use social media, including Twitter, blogs, and Facebook in order to control and collect information on the social chain's attitude and realize their reputation [9]. From the dynamic capability perspective, organizations seek to acquire capabilities which help them in strategic and successful configuration as well as reconfiguration of their competencies to deal with the changes of the environment and as a result to obtain competitive advantages. A thorough examination of supply contexts, consisting of suppliers, customers, competitors, as well as technologies can help the supply chain managers more information on the opportunities and challenges. In this regard, sensing ability is of central importance. The following hypotheses are raised in the context of supply chain management, in order to assess the effects of the constructs on supply sensing capability [10].

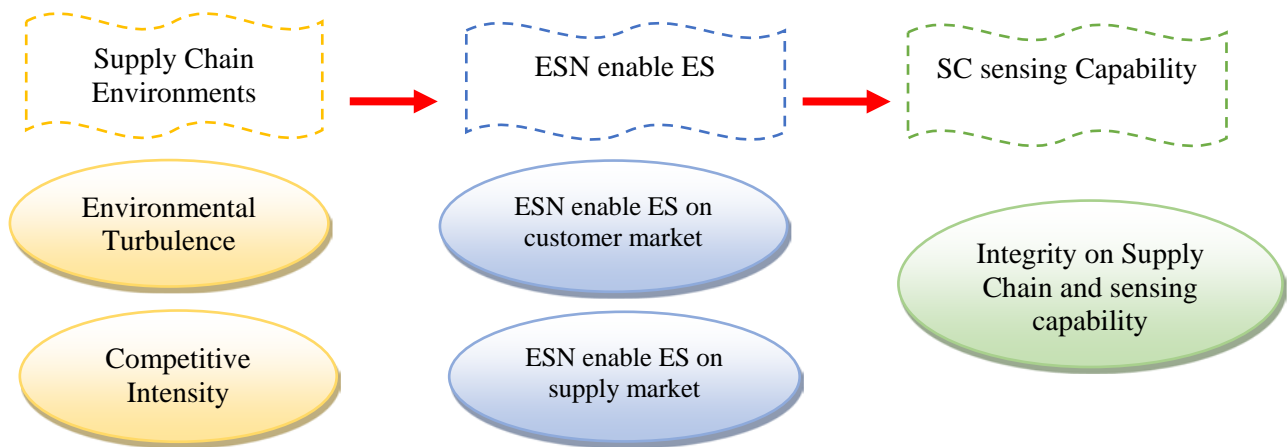


Figure 2. Research Model & Framework with Hypotheses [11]

The first two hypotheses consider the association of the environmental turbulence and ES enabled by social media in the context of supply chain. Supply chain managers rely on the environmental turbulence for the estimation of the environmental complexity and also provision of proper reactions. A virtual society is established interacting in relation to a product or an organization through social media which links the need for customer self-actualization and socialization.

2.5 Enterprise Social Networks

Within an organization, enterprise social networks enable the staff to communication with their peers, raise questions, share the news, or develop the best methods, regardless the roles, business units or geographic locations. Digital databases with content which can be searched through are provided by ESNs that go over the organizational structures and even beyond the scope of organizational hierarchies. Communications in which employees are involved, including messages to their peers, their communication network, and the outcomes of their work which could not be transparent for other organizational members will become more transparent through ESNs. Accordingly, every member can observe the messages sent by staff, the articulation of networks, production of texts, and sending of the files within the organization. This process does not lose its original form during the time and consequently other organizational members can enhance their learning and also contribution to it. Learning from the others' communications can be mentioned as one of the most significant benefits of being visible and persistent. People have the opportunity to learn at least two types of knowledge by engagement in ESN, including instrumental and Meta – knowledge. The first type, which is of importance as a kind of social learning within an organization, refers to knowledge about the way something is done. The second type refers to knowledge possessed by the organizational staff and its importance is due to the fact that instrumental knowledge can be transferred through it [3].

2.6 Impacts on Supply Chain

Knowledge management is by definition the effective communication of those having and those needing the knowledge, which leads to the change of individual into organizational knowledge. Organizations can apply knowledge management to speed up dealing with the new challenges and opportunities of the market, since it enables them to channel the most valuable organizational resources, cooperative procedures, talents, as well as experience – intellectual capital. Electronic documents, including orders, bills, as well as order and monitor processes can be standardized when such communication tools are applied, while organizations can also exploit the knowledge and experience of staff along with the cooperation resulted from formal and informal interactive networks. However, Novel procedures and technologies have emerged to support the intra- as well as inter-

enterprise (re)organizations. A more acceptable consistency between suppliers and customers, a faster reaction to customers' demands, better compatibility with market requirements, and novel methods in the process of production should be all supported. According to Kobayashi et al (2003), procedures of supply chain management have attracted considerable attention to themselves, since integration of the business processes from the suppliers to the customers is made possible along with the management of a variety tasks, including sales, production, logistics, and financial issues. Information technology, particularly, enables more exact and frequent processing of information from a variety of sources. Given the intricate networks and interconnections of the business procedures, integration and information are becoming closer than ever. Exact control and collaboration with outsources, along with the evaluation of the real time performance can be possible through ESN. Organizations will experience higher levels of pressure to collaborate and execute efficiently when this kind of close communication is established among organizational staff and supply chain partners [10].

Design of study:

The Delphi method, which combines the knowledge and potentials of various groups of experts with the ability of quantification of intangible or uncertain variables, has been used in the present study. Open questions were first used to enable data collection from a broad range of issues from the experts' panel through statistical combination of individual responses. The resulted items served as a platform for the following polls. Given the rare academic studies on the intersection of networks and SCM, an exploratory research was conducted with the involvement of the practitioners who were determined across a pioneering international organization in the area of management consulting. Practitioners were selected from this field since first of all the research topic was novel and linked the areas of social networks and SCM, and as a result, it was assumed that a small number of companies in the traditional industries including automotive, chemicals, or fast-moving consumer goods have competent staff with sufficient relevant knowledge.

The second reason to select the practitioners from the above mentioned industry was that the author was permitted to contact the company's experts. Since the buy-in and engagement of the experts in a Delphi method is sometimes achieved very hard, direct access to the company could help to identify them. Even though the author's close associations with the company managers may lead to some kind of bias, the experts can be convinced more conveniently to take part in the study.

Overall, 20 international experts agreed to take part in the Delphi study. They were divided into two groups of 12 experts with considerably excellent technical background concentrating on the transfer of social networks, and a group of 8 experts with primarily managerial background, concentrating on SCM.

Table 1. Level of Expertise

No. of participants	Master	Expert+	Expert	Advance	Novice	Σ
Social Network	4 (3)	3 (2)	3 (2)	1 (1)	1 (1)	12 (9)
Supply Chain	3 (2)	3 (3)	1 (1)	1 (1)	0 (0)	8 (7)
Σ Total Participants	7 (5)	6 (5)	4 (3)	2 (2)	1 (1)	20 (16)

■ no. of expert

■ no. of answer

Totally, 16 international experts in the fields of social network (56.25%) and supply chain (43.75%) declared their willingness for participation in the present study.

3.1 Data Collection process

Data were collected using the Delphi method in February and May, 2019. A modified survey form was sent to experts to ask their opinions through an economic as well as an effective procedure. Several reminders were sent when no responses were provided, and the experts were excluded from the study if no response was received after sending the reminders. Three rounds of Delphi procedure were followed to collect the required data.

Round 1

Three to five opportunities as well as challenges were considered in round 1 in order to raise the research questions:

1. What is the effect of application of SNs at the corporation level in your organization?
2. What is the effect of SNs on the agility and data transparency at the supply chain level?

After collection of the responses, 16 experts were provided with 144 individual answer items. Overall, 26 unique constructs were investigated at the corporate and SC levels by quantitative cluster analysis, resulting in the identification of 45 constructs across the four sub-questions associated with both opportunities and challenges (Table2).

Table 2. Breakdown of answer items and constructs per sub-question

Questions	Sub-questions	Answers
How would it be impact on cooperation level in your organization if you using SNs?	What are potential opportunities?	36
	What are potential challenges?	43
How would it be impact on agility and data transparency for supply chain if you using SNs?	What are potential opportunities?	51
	What are potential challenges?	14
		Σ 144

Prioritization and ranking of the 45 constructs across the sub-questions were performed by the expert panel in the second round of Delphi method which is quantitative in nature. Prioritization of the potential influencing factors by the panel of experts helped the researcher to select “the factors which had the highest impacts”. Individual constructs were evaluated in rounds 2 and 3 through 5-point *Likert scale* at a range of 5 (very high), 4 (high), 3 (medium), 2 (low), and 1 (very low). Moreover, another option was also considered with 0 for inapplicable cases. Evaluation of the individual frequency distribution was performed for each constructs, so that the experts’ views on the construct’s relevance could be grasped completely.

Table 3. Opportunities linked to SN

IDENTIFIED OPPORTUNITIES
1) Supply chain visibility & transparency
2) Logistic
3) Frequency of delivery
4) Integration & collaboration
5) Demand management & product planning
6) Information Sharing Management
7) Financial implication
8) Warehousing
9) Operation efficiency

Round 2

The quantitative Delphi method was applied in the second round. This step aimed at prioritizing the previous data and evaluating the opportunities as well as challenges of SNs, while indicating application of information in corporations and supply chains in order to make decisions.

The component of supply chain visibility and transparency was regarded by the experts to have the highest integration opportunity at the corporate level with 83% of the votes, while “customer behaviour” stood in the second position with 71% of the votes.

At the level of supply chain, “logistics” was determined by the experts as the highest relevant opportunity with 77% of the votes, while “supply chain visibility and transparency” was at 79% of votes.

Table 4. Challenges linked to SN

IDENTIFIED CHALLENGES
1. Governance & compliance
2) Lead time
3) Moral & managerial implication
4) Business strategy & objective
5) Product development cycle time
6) Manufacturing cost
7) Information & cyber security
8) Integration & collaboration
9) Transformational change

Round 3

Here, experts accredited their primary priorities provided in the previous round compared to the group response. It was aimed to promote the quality of responses given by each expert and also influence the total quality of the group responses regarding higher balance in rating distribution. Accordingly, the highest integration relevance for challenges was observed in “governance and compliance” at the corporate level with 88% of the votes, while “lead time” had the second rank with 76% of the votes. The component of “governance and compliance” had the first priority with 78% of the votes on the supply chain level, while “lead time” allocated the second priority to itself with 73% of the votes.

Conclusion

The influence of social networks on the supply chain management was emphasized in the present paper through examination of the related literature. The contribution of the information technology has currently changed from a database-dependent passive management enabler to a considerably developed process controller through which all activities can be exactly monitored by the organization. According to the present study, all the challenges of the supply chain cannot be solved by social networks; nevertheless, SNs as well as ESNs are required for the analysis of supply chain issues and decision making through the organization, because of several features, some of which are as follows: the ability to share a wide range of information in the supply chain processes and also the potential of accumulation of information across the organization, while employing external as well as internal information in the supply chain processes. Organizations are extending the scope of their activities and concentrating primarily on their central capabilities in the current economic environment. Moreover, understanding the complicated interaction of social media technologies with business context will enhance the favourable business consequences, while reducing the negative effects.

Ultimately, according to the relevant literature, it can be concluded that organizations have to invest on SNs as well as ESNs if they want to be up-to-date in the business context and have the ability to deal with the market changes, while supplying the products and services as fast as possible.

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