2014

Usage of Social Software in Supply Chain Identification: An Exploratory Study of European and Chinese Internet

Holger Schrödl
Otto-von-Guericke University Magdeburg, Germany, holger.schroedl@ovgu.de

7P. Usage of Social Software in Supply Chain Identification: An Exploratory Study of European and Chinese Internet Platforms

Holger Schrödl
Otto-von-Guericke University Magdeburg, Germany
holger.schroedl@ovgu.de

Abstract
Finding optimal suppliers for complex customer offerings is challenging. For product components like services and rights, relevant information from the potential suppliers is crucial. Social software like online networks, blogs, or wikis might be a place to find this information. Research shows that the adoption of social software highly depends on national attitude. This paper studies the content and functionality of social software in different sociological areas through a cross-national comparison between Europe and the GCR (Greater Chinese Area). The leads to insights into the potential of social software in supply chain management processes depending on the sociological area.

Keywords
Social Software, Supply Chain Management, cross-country comparison, exploratory study.

1. Motivation
To achieve competitive advantage in highly dynamic markets, companies are challenged with a new way of interacting with their business partners (Cravens, Piercy, & Shipp, 1996; Ireland, 2002). The development of ICT (information and communication technology) helps to fulfill the requirements of data and information flow between business partners in the form of network integration (Auramo, Kauremaa, & Tanskanen, 2005; Dimitriadis *, N. I. & Koh, S. C. L., 2005; Möller, Rajala, & Svahn, 2005). Of central interest here are supply networks, which consist of multiple independent suppliers, of which one is called a focal supplier (Provan, 1993). The focal supplier is the supplier who prepares the offer for the customer. This innovative approach, however, requires a paradigm shift both in the relationship with customers as well as in the relationship with suppliers that are needed for product and service generation (Basole & Rouse, 2008; Walters, 2004). Due to the high degree of integration of the customer in the service production and delivery, there is a strong need to create network structures that enable information, communication, and power flow. Developments like E-SCM (Electronic Supply Chain Management) link e-commerce issues to supply chain management with a technology-based linkage (Poirier & Bauer, 2001; Williams, Esper, & Ozment, 2002).

Recent developments show that, especially in network structures with a focus on information and communication exchange between the stakeholders, digital social networks are intensely discussed (Carter, Enram, & Tate, 2007; Carter, Leuschner, & Rogers, 2007; Galaskiewicz, 2011). These discussions are mainly motivated by the fact that, from a sociological perspective, social ties play an important role in supply chain management (Koppenhagen, Katz, Mueller, &

Maedche, 2011; Lazzarini, Chaddad, & Cook, 2001). In the private environment, these online networks are considered as already established (Boyd & Ellison, 2008; Richter & Koch, Februar 2007). Initial research shows that the information contained in digital social networks may lead to significant improvements in supply chain processes (Rai, Patnayakuni, & Seth, 2006; Schrödl, 2010). Taking into account that digital social networks, moreover social software, depend on their sociopolitical environment, will this hold true in a global setting for supply chain enhancement?

A very dynamic environment for the development of digital social networks is the Greater China Region (GCR) (Bian, Breiger, Galaskiewicz, & Davis, 2005). Digital social networks are very popular in this area which might have its reason the specific social communication structure in GCR (Ruan, Freeman, Dai, Pan, & Zhang, 1997). At least, in the private environment, digital social networks are highly adopted, and a critical element in private communications (Kumar, Novak, & Tomkins, 2010). For the usage of digital social networks in the corporate environment, only a few studies can be found (Rauch & Trindade, 2002; Saxenian, 2002). This is highly in contrast to the situation in the European area. Digital social networks are well accepted, mainly in the private environment, but not that essential in the daily private communication (Pichler & Wallace, 2007). In addition, the role of digital social networks in the corporate environment is well investigated (Booth & Matic, 2011; Horton, Serafeim, & Tuna, 2009; Kleinbaum & Stuart, 2014). In summary, in the GCR, digital social networks are essential in the private environment, but there are nearly no insights in the adoption in the corporate environment, whereas, in Europe, digital social networks are well accepted in the private and the corporate environment with first insights of the positive effects of the usage of digital social networks in certain business transaction. Therefore, this paper aims to investigate these differences in the context of a comparative study on the usage of digital social networks in the corporate environment between GCR and Europe.

The central research question for this paper is: Are there differences in the content and functionality of social software concerning their usability for supply chain identification between the European market and the market in the Greater China Region (GCR)? To elaborate on this question, existing implementation forms of social software are investigated for their properties and content and placed in the context of strategic and operational supplier identification.

The paper is structured as follows: in Section 2, the current state of research on the subjects of social software, supply chain identification, and related e-commerce development in the GCR is presented on the basis of a literature study. In Section 3, the methodology is described including the design of the case study, the data sources, the methodology for data collection, and data analysis. Section 4 gives the results of the conducted study in a quantitative and qualitative way. We conclude the paper with a summary of the study and an outlook for further research needs in Section 5.

2. Research Background

2.1 Social Networks and Web 2.0

"Web 2.0" is a new paradigm of internet usage that not just distributes information, but furthermore involves internet users as an active part of the internet usage by generating additional value through the usage of different technologies and applications (Gabler Wirtschaftslexikon). In 2005, Tim O'Reilly gave a more precise definition of the term "web 2.0". In his definition, he states, "web 2.0" consists of several characteristics with three central aspects: the usage of services instead of packaged software, a mixture between data sources and data transformations, and a new participant architecture of users getting to developers and authors (Musser & O'Reilly, 2007). Putting more emphasis on the technological context, Koch and Richter defined "web 2.0" as a collection of technologies that are able to support the usage characteristics of the new internet usage paradigm (Koch & Richter, 2009). This leads to the definition of the term "social software" which is mostly common in current literature. Therefore, "social software" is defined as applications which are able to support the usage concepts of web 2.0. This definition follows the definition of Coates, who describes "social software" "… as software which supports, extends, or derives added value from human social behavior message boards, musical taste sharing, photo sharing, instant messaging, mailing lists, and social networking." (Coates, 2005). As this definition is very broad, Koch and Richter made up a classification of social software. They provided five classes to segment the different applications: blogs, wikis, social tagging, social networking services, and instant messaging (Koch & Richter, 2009). In this paper, we follow the definition according to (Boyd & Ellison, 2008) where a digital social network is a form of web-based service for individuals to realize public or semi-public profiles together with a list of connections to other users and the possibility to parse these connections within the system.

The use of social networks in a private environment can be classified as well established due to the number of users (Boyd & Ellison, 2008). Online communities and blogs are becoming increasing popular in China (CNNIC, 2009). In a business environment, the usage of social networks is not well established yet. There is some academic work on the general topic of integrating social software in business processes (Johannesson, Andersson, & Wohed, 2009) or on the topic of process management with blogs and social software (Vanderhaeghen, Fettke, & Loos, 2010). Studies show that, in the business environment, business networks, wikis, and blogs have an especially high potential to enhance the communication between business partners (Cyganski, 2008).

2.2 Supply Chain Identification

The strategic importance of the procurement function is widely recognized (Hahn & Kaufmann, 2002; Holbach, 2002; Krampf, 2000). The tasks and subtasks of the procurement function are classified in three areas: market tasks, supplier tasks, and tasks for the company itself (Ernst, 1996; Friedl, 1990; Roland, 1993). Throughout the course of this paper, the focus is on the consideration of the supplier-related tasks, which include essential methods for identification, selection, and qualification of potential suppliers. In order to meet demand, supplier

identification is used to identify vendors in a market that offers the required procurement object, i.e. material, services, or intangible assets (Auster & Oaxaca, 1981; Eon-Kyung Lee, Sungdo Ha, & Sheung-Kown Kim, 2001; Koppelmann, 2004; McGinnis & Vallopra, 1999). Supplier selection uses the information procured during supplier identification to decide which supplier will be selected to establish a relationship. Supplier qualification covers the long-term aspects of a company-supplier relationship and enhances it to increase business value.

For the identification, selection, and qualification of suppliers in supply networks, several functions are necessary. A summary of these functions may be obtained from Table 1. These functions serve as a foundation for the investigation of the social software implementation forms in this paper.

Table 1. Characteristic areas of supplier identification

Area	Characteristics Area
supplier identification	Search Capabilities (Koppelmann, 2004) Integration of self-information (Lasch & Janker, 2005) Usage of classification standards (Bundesverband Materialwirtschaft, 2005; eCl@ss e.V.)
supplier selection	Integration of additional information (Klein et al., 2009) Integration of external rating information (Large, 2006)
supplier qualification	Maintaining linkage (Klein et al., 2009) Distribution of information updates (Cyganski, 2008) Establishment of closed groups (Cyganski, 2008)

2.3 Growth of E-Commerce in the Greater China Region

According to the 1997-2009 China E-commerce report, the development of e-commerce in the GCR can be divided into five stages: germination period (1997-1999), frozen and adjustment period (2000-2002), recovery (2003-2005), rapid development (2006-2007) and transformation (2008-2009) (toocle.com, 2010b). E-commerce emerged in the GCR in 1997; 5.2% of the current e-commerce websites were launched during the germination period, such as Alibaba group, Dangdang, and eBay. The first vertical B2B e-commerce site was launched by ChinaChem Net in December 1997. Since 2003, e-commerce has recovered from its trough. A number of B2B e-commerce Web sites balanced between benefit and cost in 2003, and 30.1% of e-commerce websites were set offline during the recovery period. Then, e-commerce in China grew fast and most of B2B e-commerce websites profited during 2006-2007. The global financial crisis that happened in 2008 had a serious effect on the development of B2B e-commerce in the GCR, especially for some export-oriented SMEs. The development speed of e-commerce decreased during this period. The main pattern of e-commerce in the GCR is the B2B e-commerce.

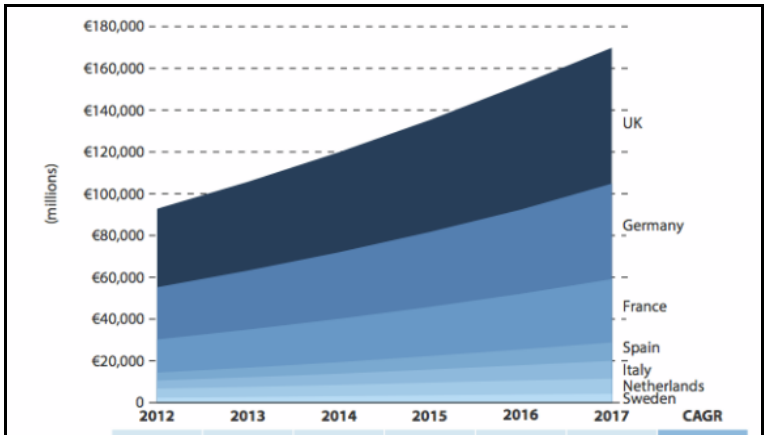
According to 2010 Annual China E-commerce Market Survey Report by China e-Business Research Center (toocle.com, 2010a), the number of transactions on the B2B market in China grew 15.8% from 3.28 trillion yuan in 2009 to 3.8 trillion yuan by the end of 2010. The amount of the profit of B2B e-commerce companies grew by 35% in 2010 to hit 95.5 hundred million. According to the investigation of Business Club, there were more than 200 websites on the

commodities market by the end of July 2010, and the annual average transaction was 32.09 billion yuan (toocle.com, 22.03.2010).

The B2B market has developed in the GCR with the widespread, increasing internet usage among enterprises. With the popularity of the internet, the value of the internet for enterprises has increased, which drives enterprises to speed up their prevalence on the internet. The amount of e-commerce service enterprises increased 21.3% from 7580 in 2009 to 9200 by the end of 2010. The 27th China Internet Development Status Statistic Report in January 2011 by the China Internet Network Information Center (CNNIC) shows that 92.7% of enterprises in China are connected to the internet and 43% of enterprises launched their own websites by the end of December 2010 (China Internet Network Information Center (CNNIC), 2011).

2.4 Growth of E-Commerce in Europe

According to a recent study of Forrester Research, growth of e-commerce in Europe is steadily increasing and will increase even more by the year 2017 (Forrester Research, 2013). Regarding the different countries in Europe, the spread of the annual growth rate is between 9% at the low end for the Netherlands and up to 18% for Spain. Countries with the highest adoption rate of e-commerce like the UK and Germany have an annual growth rate of 10% resp. 11%. Details of this market development can be obtained in Figure 1.



	2012	2013	2014	2015	2016	2017	CAGR
Sweden	€2,500	€2,878	€3,234	€3,627	€3,970	€4,258	11%
Netherlands	€4,631	€5,106	€5,600	€6,147	€6,668	€7,125	9%
Italy	€3,993	€4,727	€5,485	€6,326	€7,276	€8,336	16%
Spain	€3,963	€4,776	€5,677	€6,708	€7,871	€9,108	18%
France	€17,989	€20,618	€23,221	€25,716	€28,180	€30,678	11%
Germany	€27,154	€30,874	€34,552	€38,451	€42,521	€46,356	11%
UK	€40,105	€45,020	€49,913	€54,840	€59,679	€64,104	10%

Figure 1: European Online Retail Sales By Country, 2012-2017 (Forrester Research, 2013)

As depicted in Figure 1, European e-commerce will reach 165 billion € by 2017. Regarding the starting point of 95 billion € in 2012, this means an annual growth rate of approximately 11% over the next years. A commentary from eMarketer to this study underpins this vision of growth (eMarketer, 2013). Therefore, we see a huge significance in e-commerce activities for all sales activities and growth expectations in Europe. Besides this general observation on the e-

commerce market, two aspect can be highlighted. First, it is expected that southern European countries like Spain or Italy will have the fastest growth rates in the next years. This may be concluded by the fact that online shopping becomes a mainstream activity in these countries. Second, countries in Northern Europe will enter a new phase of competitive expansion. Online shopping is convenient in Northern Europe and retailers use multiple channels so sell their products to their customers. Therefore, companies will have to optimize this multichannel approach by introducing innovative selling solutions to gain competitive advantage.

3. Methodology and Research Design

3.1 Methodology

We conducted an exploratory, data-based field study to elaborate the status quo and the potential of digital social networks in the context of supply networks. For a structured comparison, we relied on the comparison framework developed by Schrödl (Schrödl, 2010). This framework shows that there are three types of social software which are generally suitable to contain relevant information for supply network identification: business networks, blogs, and wiki-based information systems. It is stated furthermore that business networks and blogs have a significant impact in the stages of supplier identification and supplier selection, whereas wiki-based information systems are mainly suitable for the phase of supplier qualification.

3.2 Research Design

The conducted research is segmented in three phases: first, there is a sampling of cases; second, data is gathered, and third, the gathered data is analyzed. In order to increase the depth of analysis and to acquire experience with gathering unfamiliar data, we decided to select one case (Numagami, 1998). The sample "business card" was selected for three reasons: Firstly, everyone has a clear understanding of a business card. Secondly, apart from very simple business cards, a business card can be divided into several modules that also have different types of content. The type of paper, for example, is the physical component. As service components there are the printing style, the text written on the card, and the graphical design. Moreover, there are intangible components like the right to use a logo or graphical element, a specific font, or a particular picture for the design of the card. At last, there might be additional services like fast and secure delivery. To conduct the search for suppliers, we used three search terms: "Visitenkarten" (for German platforms), "business cards" (for English platforms), and "名片" (for Chinese platforms).

3.3 Data Sources

According to the exploratory design of the study, we decided to choose two types of data sources. We chose "classic" types of data sources, which are familiar to use in supply chain identification like internet search engines and online supplier catalogues. We also chose "new" types of data sources that are rarely used in supply chain identification. Following Schrödl (Schrödl, 2010) we took business networks, blogs, and wiki-based systems into account. From every type of data source, we identified leading platforms according to market studies and

related literature in the corresponding area to identify specific region-related issues. For the European region, we decided to take the leading internet offerings in Germany as representative of European countries. A recent study from BITKOM (Bundesverband Informationswirtschaft Telekommunikation und neue Medien e.V., 2009) shows that on average 27% of all companies in Europe use online systems for procurement and 13% of all European companies sell their products online. Among these 27 European countries, Germany holds the fourth place in online procurement with 44% of all companies using it and the fifth place in online selling with 20% of all companies using this distribution channel. In summary, we investigated the following Internet offerings for the study (see Table 2).

Table 2. Overview of the selected internet offerings for the exploratory study

e-commerce type	**Europe**	**Greater China Region**
internet search	google.de, yahoo.de, bing.de	baidu.com, google.com.hk
online supplier catalog	werliefertwas.de	china.alibaba.com
private social network	facebook.de, myspace.de	renren.com
business network	XING.de, LinkedIn.de	XING.com, LinkedIn.com, Tianji.com
blog / micro-blog	technorati.com, blogsearch.google.de, twitter.com	Sina weibo (t.sina.com.cn)

3.4 Data Collection

The data collection was done by submitting the defined search strings to the examined platforms. The European platforms have been investigated from a German location near Munich, and the platforms from the GCR were investigated from a Chinese location near Chengdu. The investigation took place in the time from mid December 2010 to the beginning of February 2011 and was made by two different people, one in Germany and the other in China.

3.5 Data Analysis

For the quantitative investigation, we counted the results that were retrieved through the search process. Depending on the platform, it was not always clear how many results exactly were retrieved. The Google search engine, for example, just gives an approximate number, as a result. Xing business networks give an exact number of search results, and Twitter provides no information about the number of search results. In the first case, we decided to take the approximate number displayed from the platform as the real result. In the second case, we took the number of results as the real result. In the third case, we tried to estimate the dimension of the number of results. To do this, we navigated over several pages of the displayed results to categorize the dimension of the results in three categories: below 100, below 500 or above 500.
To explore qualitative aspects of the different platforms, specific functionalities related to the requirements of supplier identification as shown in Table 1 were tested. For this purpose, we developed a structured question framework to ensure consistency in the conduction of the study (Kromrey, 2006). There are specific questions for every characteristic's area, which reflect the functionality needed to realize a certain capability. Every question in this question framework

was designed to be answered easily with three possibilities: Y (a certain functionality is present), N (a certain functionality is not present), or P (a certain functionality is not fully present, but there are some aspects of the functionality). An overview of the question framework can be obtained in Table 3.

Table 3. Question Framework for qualitative Analysis

Characteristics	**Questions**	**Question-ID**
Search Capabilities	Is there a search engine integrated in the platform?	1-1
	Is the search engine for almost everything on the platform or only for parts of the platform?	1-2
	Is content from the platform searchable from external search engines like Google?	1-3
Integration of self-information	Can the supplier include information about himself on the platform?	2-1
	Can the supplier include information about himself in a structured form?	2-2
Usage of classification standards	Can a search be conducted via classification standards? (e.g. eClass, proficlass, ETIM, UNSPSC, …)	3-1
Integration of additional information	Can additional information be integrated into the platform?	4-1
	Can additional information be integrated in a structured way?	4-2
	Is this additional information searchable?	4-3
Integration of external rating information	Can external rating information be integrated in the platform? (like Ebay-seller-information, Amazon rating, external business ratings, …)	5-1
	Can these ratings be integrated in the search?	5-2
Maintaining linkage	Can links be established between people?	6-1
	Can links be established between other content items?	6-2
	Can these links be maintained automatically?	6-3
Distribution of information updates	When a supplier updates its information on the platform, are these updates distributed automatically?	7-1
Establishment of closed groups	Can closed groups within the platform be established?	8-1

4. Case Study Results

4.1 Quantitative Findings

First, we draw attention to the amount of objects which are available for being considered as inputs for supplier identification (see Tab. 4).

Table 4. Quantitative findings

Data source type	Area	Platform	Search string			
			"Visitenkarten"	"Business Cards"	"名片"	total
Internet Search	Europe	google.de	app. 5.4 mio.	app. 19.4 mio.	n.a.	app. 24.8 mio
		lycos.de	app. 15.4 mio.	app. 398 mio.	n.a.	app. 413.4 mio.
		Bing.de	app. 15.4 mio.	app. 479 mio.	n.a.	app. 494.4 mio.
	GCR	baidu.com	n.a.	app. 6.49 mio.	app. 100 mio.	app. 106.49 mio.
		google.com.hk	n.a.	app. 249 mio	app. 534 mio.	app. 783 mio.
Online business catalogue	Europe	wlw.de	2.665	No additional	n.a.	2.665
	GCR	china.alibaba.com	n.a.	2	219.346	219.348
Private social network	Europe	facebook.de	1	>500	n.a.	>500
		myspace.de	1	21	n.a.	22
	GCR	renren.com	n.a.	5	113	118
Business Network	Europe	xing.de	4.506	1933	n.a.	6.439
		linkedin.de	120	147.041	n.a.	147.161
	GCR	xing.com	n.a.	1.906	34	1.940
		linkedin.com	n.a.	148.607	11	148.618
		tianji.com	n.a.	>1000	68	>1068
Blogs / Microblogs	Europe	twitter.com	>1000	>1000	n.a.	>1000
		technorati.com	9	465	n.a.	474
		blogsearch.google.de	app.104.000	app. 11 mio.	n.a.	app. 11.1 mio.
	GCR	t.sina.com.cn	n.a.	178	141.216	141.394

The number of results obtained through internet search engines are, are expected, extremely large. is the results range from approximately 25 mio. by google.de up to approximately 800 mio. obtained by google.com.hk. Therefore, it is not possible to separate the relevant results from those that are not.

Searching for "Visitenkarten" in the business catalog for suppliers "wer-liefert-was" delivers 2,657 results, which is much less than the internet-based search. Though, as these online catalogues work like a specific dictionary, all of the retrieved results are relevant to the search. The results are automatically divided into different categories. In our example, there were 18 categories to help to further navigate through the results. When trying the English search term "business card", there were no new or additional results. Searching for "名片" in 1688.com, the product sub-search engine of Alibaba, delivers 219,346 results. At initial glance at the returned results, a large fraction of them is relevant to the search. In addition, the search result page provides relevant categories, such as design, print, cardholders, and more.

For a search on Facebook, we used a regular account with typical settings and approximately 50 connections of different types. The search for "Visitenkarten" led to several results that were divided into different result objects. The division into different objects is done by Facebook automatically and is aligned to the object structure in Facebook. From the search, one person, four pages, over 300 groups, and 14 posted contributions were identified. In every result category, there were people or companies who were involved in the manufacturing of business cards. Searching for "名片" in the Chinese RenRen search engine leads to 97 individuals and 16

public websites. Yet, at first, there are not any relevant results. Most users of the Chinese social network are students in colleges, what might explain the performance of these results.

In XING (www.xing.com), we used a premium account with approximately 150 connections and membership in about 12 Xing groups for the search. We derived about 300 results in the search for business cards, separated into different result objects. Searching for "名片" in xing.com delivers 34 results, and the performance of results is high. The amount of members in the XING Chinese community is 7635. For Linkedln, we used a standard account with approximately 30 connections. There were 10 results, of which three were relevant, by entering "名片" in the search engine. The explanation of the results is that the Linkedln site is not available in Chinese, and the participation of Chinese users is comparably low. Tianji is a business-oriented social networking site in China. Its function is similar to XING. A search for "名片" yielded 62 results of which 13 were relevant for the search.

For blog search engines like technorati.com and blogsearch.google.de the results range from approximately 500 from technorati to approximately 11 million in the Google blog search. The results from technorati.com deal with information about companies and are, therefore, mostly relevant for the search. The results from blogsearch.google.de are more product and marketing oriented and are, therefore, only limitedly related to the search. A search on micros-blogging platforms like twitter.de and t-sina.com.cn lead to many results (we could not exactly determine the number of results on twitter, but we estimate that the number might be similar to the number on t.sina.com.cn, which is approximately 140,000 results). The information contained in the tweets is marketing information, but it is also company information and can, therefore, be regarded as partially relevant to the search.

4.2 Functional Findings

Functional findings can be obtained from Table 5.

Beyond the search mechanism, there is not much additional functionality for supplier identification from internet search engines. We see some differences between the platforms in the integration of additional information. The Google search engine is much more able to integrate additional information into the search process, while the Baidu search engine allows users to establish links. In general, areas of linkage, update distribution, and closed groups are not addressed by Internet search engines.

Online business catalogs are able to enhance the information richness and quality of classic internet searches. These catalogues are searchable, mostly by their own search engines, which are integrated into the platform, but the content is richer and more specific than the regular internet content. Therefore, the results are more relevant than from the classic internet search. On the other hand, online business catalogs can be regarded as closed information areas, unable to integrate additional or external information into the catalog. Moreover, it is not possible to establish linkage or closed groups in online business catalogues. There are some slight differences between the two online business catalogs which have been investigated. The European wer-liefert-was.de is a classic catalog, whereas china.alibaba.com can also be regarded as a directory for an electronic marketplace. This explains the differences in the functionality.

For online business catalogues, china.alibaba.com is the largest Business-to-Business e-market platform and has high performance in functionality related to the requirement of supplier identification. The platform offers an instant communication platform for suppliers. The suppliers in this platform can update self-information in a structured way. One can get additional information such as a score or an opinion of previous transactions from references. Suppliers can provide self-information though the platform such as registered addresses, legal forms, legal representatives, and registered capitals. This would help focal suppliers estimate the quality of suppliers. This platform is, however, unable to integrate external rating information. The platform provides the function of further sorting SE results according to the geographic information, pricing, and more.

Table 5. Qualitative findings

	Question-ID	google.de	yoos.de	bing.de	baidu.com	google.hk	werliefertwas.de	china.alibaba.com	facebook.de	myspace.de	renren.com	xing.de	linkedin.de	xing.com	linkedin.com	tianji.com	twitter.com	technorati.de	blogsearch.google.de	t.sina.com.cn
Search Capabilities	**1-1**	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	1-2	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	Y
	1-3	Y	Y	Y	Y	Y	Y	Y	P	P	P	P	P	P	P	Y	Y	Y	Y	Y
Integration of self-information	**2-1**	N	N	N	P	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	Y	Y	Y
	2-2	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	P
Usage of classification standards	**3-1**	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Integration of additional information	**4-1**	N	N	N	N	N	N	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
	4-2	Y	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
	4-3	Y	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Integration of external rating information	**5-1**	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	5-2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Maintaining linkage	**6-1**	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
	6-2	N	N	N	N	N	N	P	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	N
	6-3	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
Distribution of information updates	**7-1**	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y
Establishment of closed groups	**8-1**	N	N	N	N	N	N	P	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N

Private social networks are strong in establishing and maintaining linkages, as that is for what they are designed. It is easy to integrate additional information through various input fields, but it is not possible to integrate external information into the platform to make it searchable. Every digital social network platform uses a categorization for the objects on the platform. Facebook, for example, uses seven categories for its objects: people, pages, groups, applications, event, articles from friends, and general articles. After submitting the search phrase, the results are

categorized automatically through Facebook into these seven categories. By looking at the search results for our search term, it can be noticed that these categories are sometimes "misused" to display relevant information. For example, a company has used the object "event" to highlight special sales promotions.

From a functionality point of view, business networks are similar to private social networks. The emphasis is on the linkage, as well as the integration of external information, is limited or even not possible. The search engines in the business networks also use categories to structure the search results. Xing, for example, uses the categories members, groups, events, jobs, and companies to structure the results. Regarding the content of business networks, it is much more likely to identify potential suppliers on business networks than on private networks. For business networks, we get additional information with every result about references (who trusts this supplier), and we can see how good the linkage is to the potential supplier. Therefore, we can decide whether we will consider this supplier for selection or not.

We investigated two different types of blogs in this case study: micro-blogs like twitter.de and t.sina.com.cn and blog search engines like technorati.com and blogsearch.google.com. During the conduction of the study, it became clear that these are very different types of data sources in their functionality and contained information. In the area of micro-blogging, we had to deal with highly unstructured information, but the content was very rich considering business decisions. We see the possibility of keeping and tracing linkages between the members to improve confidence in the decision, and we see the search functionality in micro-blogs. It is not possible, however, to integrate external content into the search process and improve the decision based on this. On the other hand, blog search engines like technorati and blogsearch.google.de are able to identify relevant content. In technorati, it is possible to search for blogs or posts. Unfortunately, in terms of integrating external information and forming linkage, there is no support from the blog search engines.

5. Summary and outlook

The aim of this paper was to answer the question about differences in the content and functionality of social software in Europe and the Greater China Region in terms of supplier identification in supply chain management. To answer this question, an exploratory study was conducted of 11 European and 8 GCR internet platforms from 5 different e-commerce types: internet search engines, online supplier catalogs, private social networks, business networks, and blogs. The case of identifying suppliers for the product "business cards" was conducted, and the quantitative and qualitative results were analyzed. For the European region, we saw benefits in the functionality of internet search engines and the relevant content of private social networks and business networks. For the GCR region, we saw benefits in the amount of search results from internet platforms and the functionality and perspective of online supplier catalogues. Despite these positive aspects, we identified several issues to address in the future: enhancing the flexibility of the platforms, especially the European one, and enriching content on the GCR platform. This will lead to significant positive effects in the future of supplier identification in supply chain management. The common aspect for both regions is the integration aspects. While the fact that this case study has shown that business-relevant content is available for improving

decisions, the question is actually about integrating this information into current and future supply chain management systems.

In addition to these results, further research is needed. On one hand, there should be more empirical work done on the current situation of companies in their procurement processes and whether they should use social software for supplier identification and selection and in which way. This might be done by a broad survey-based field study covering different aspects of the investigated objects. These results would give an excellent insight for future modeling aspects of supply networks. On the other hand, it would be beneficial to investigate the integration of social software technologies in information systems e.g. enterprise resource planning systems or customer relationship management systems. This would lead to a discussion about efficient design and architecture of Web 2.0-enhanced information systems.

6. References

Auramo, J., Kauremaa, J., & Tanskanen, K. (2005). Benefits of IT in supply chain management: an explorative study of progressive companies. *International Journal of Physical Distribution & Logistics Management*, *35*(2), 82–100. doi:10.1108/09600030510590282

Auster, R. D., & Oaxaca, R. L. (1981). Identification of Supplier Induced Demand in the Health Care Sector. *The Journal of Human Resources*, *16*(3), p 327-342.

Basole, R. C., & Rouse, W. B. (2008). Complexity of service value networks: Conceptualization and empirical investigation. *IBM Systems Journal*, *47*(1), 53–70. doi:10.1147/sj.471.0053

Bian, Y., Breiger, R., Galaskiewicz, J., & Davis, D. (2005). Occupation, Class, and Social Networks in Urban China. *Social Forces*, *83*(4), 1443–1468. doi:10.1353/sof.2005.0053

Booth, N., & Matic, J. A. (2011). Mapping and leveraging influencers in social media to shape corporate brand perceptions. *Corporate Communications: An International Journal*, *16*(3), 184–191. doi:10.1108/13563281111156853

Boyd, D. M., & Ellison, N. B. (2008). Social Network Sites: Definition, History, and Scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210–230. doi:10.1111/j.1083-6101.2007.00393.x

Bundesverband Informationswirtschaft Telekommunikation und neue Medien e.V. (2009). *Europäischer E-Commerce – Anteil von Unternehmen*.

Bundesverband Materialwirtschaft, E. u. L. e. V. (2005). *BMECat*.

Carter, C. R., Enram, L. M., & Tate, W. (2007). The Use of Social Network Analysis in Logistics Research. *Journal of Business Logistics*, *28*(1), 137–168.

Carter, C. R., Leuschner, R., & Rogers, D. S. (2007). A social network analysis of the Journal of Supply Chain Management: knowledge generation, knowledge diffusion and thought leadership. *Journal of Supply Chain Management*, *43*(2), 15–28.

China Internet Network Information Center (CNNIC). (2011). *The 27th China Internet development Status Statistic Report*. Retrieved from http://research.cnnic.cn/img/h000/h12/attach201101211728520.pdf

CNNIC. (2009). *2009中国网民社交网络应用研究报告*. Retrieved from http://research.cnnic.cn/html/1257998660d1530.html

Coates, T. (2005). *An addendum to a definition of Social Software*. Retrieved from http://www.plasticbag.org/archives/2005/01/an_addendum_to_a_definition_of_social_sw/

Cravens, D. W., Piercy, N. F., & Shipp, S. H. (1996). New Organizational Forms for Competing in Highly Dynamic Environments: the Network Paradigm. *British Journal of Management*, *7*(3), 203–218. doi:10.1111/j.1467-8551.1996.tb00115.x

Cyganski, P. (2008). Soziale Netzwerke im Web 2.0: Chancen, Risiken und Veränderungen für Organisationen. *Wertschöpfungsnetzwerke*, 305–324.

Dimitriadis *, N. I., & Koh, S. C. L. (2005). Information flow and supply chain management in local production networks: the role of people and information systems. *Production Planning & Control*, *16*(6), 545–554. doi:10.1080/09537280500112397

eCl@ss e.V. *eCl@ss Classification and Product Description*. Retrieved from www.eclass.de

eMarketer. (2013). *Double-Digit Ecommerce Growth Story Continues in Western Europe*. Retrieved from http://www.emarketer.com/Article/Double-Digit-Ecommerce-Growth-Story-Continues-Western-Europe/1009777

Eon-Kyung Lee, Sungdo Ha, & Sheung-Kown Kim. (2001). Supplier selection and management system considering relationships in supply chain management. *IEEE Transactions on Engineering Management*, *48*(3), 307–318. doi:10.1109/17.946529

Ernst, A. (1996). *Methoden im Beschaffungsmarketing*. [Köln]: Förderges. Produkt-Marketing.

Forrester Research. (2013). *European Online Retail Forecast, 2012 To 2017: Economic Instability Across Europe Will Do Little To Slow Retail eCommerce Growth*.

Friedl, B. (1990). *Grundlagen des Beschaffungscontrolling*. Berlin: Duncker & Humblot.

Gabler Wirtschaftslexikon. *Stichwort: Web 2.0*. Retrieved from http://wirtschaftslexikon.gabler.de/Archiv/80667/web-2-0-v7.html

Galaskiewicz, J. (2011). Studying Supply Chains from a Social Network Perspective. *Journal of Supply Chain Management*, *47*(1), 4-8. doi:10.1111/j.1745-493X.2010.03209.x

Hahn, D., & Kaufmann, L. (2002). *Handbuch industrielles Beschaffungsmanagement: Internationale Konzepte - innovative Instrumente - aktuelle Praxisbeispiele* (2., überarb. und erw. Aufl.). Wiesbaden: Gabler.

Holbach, D. (2002). *Beschaffungsmarktforschung in der digitalen vernetzten Welt: Grundlagen, Analyse und Anwendungen*. Frankfurt am Main: DVS.

Horton, J., Serafeim, G., & Tuna, A. I. (2009). Social Networks: The Impact on Firms' Information Environment and Corporate Communication. *SSRN Electronic Journal*. doi:10.2139/ssrn.1466063

Ireland, R. D. (2002). Alliance Management as a Source of Competitive Advantage. *Journal of Management*, *28*(3), 413–446. doi:10.1177/014920630202800308

Johannesson, P., Andersson, B., & Wohed, P. (2009). Business Process Management with Social Software Systems – A New Paradigm for Work Organisation. In W. Aalst, J. Mylopoulos, N. M. Sadeh, M. J. Shaw, C. Szyperski, D. Ardagna, … (Eds.), *Lecture Notes in Business Information Processing. Business Process Management Workshops* (pp. 659–665). Springer Berlin Heidelberg.

Klein, R. N., Beutelspacher, L., Hauk, K., Terp, C., Anuschewski, D., Zensen, C., …Weller, K. (2009). Informationskompetenz in Zeiten des Web 2.0: Chancen und Herausforderungen im Umgang mit Social Software. *Information - Wissenschaft und Praxis*, *60*(3), 129–142.

Kleinbaum, A. M., & Stuart, T. E. (2014). Inside the black box of the corporate staff: Social networks and the implementation of corporate strategy. *Strategic Management Journal*, *35*(1), 24–47. doi:10.1002/smj.2090

Koch, M., & Richter, A. (2009). *Enterprise 2.0: Planung, Einführung und erfolgreicher Einsatz von Social-Software in Unternehmen* (2., aktualisierte und erw). München: Oldenbourg.

Koppelmann, U. (2004). *Beschaffungsmarketing* (4., neu bearb. Aufl.). *Springer-Lehrbuch*. Berlin: Springer.

Koppenhagen, N., Katz, N., Mueller, B., & Maedche, A. (2011). How Do Procurement Networks Become Social? Design Principles Evaluation in a Heterogeneous Environment of Structured and Unstructured Interactions. In AIS (Ed.), *Proceedings of the ICIS 2011* (pp. paper 7).

Krampf, P. (2000). *Strategisches Beschaffungsmanagement in industriellen Grossunternehmen: Ein hierarchisches Konzept am Beispiel der Automobilindustrie*. Lohmar: Eul.

Kromrey, H. (2006). *Empirische Sozialforschung: Modelle und Methoden der standardisierten Datenerhebung und Datenauswertung* (11.th ed.). Stuttgart: Lucius & Lucius.

Kumar, R., Novak, J., & Tomkins, A. (2010). Structure and Evolution of Online Social Networks. In P. S. Yu, J. Han, & C. Faloutsos (Eds.), *Link Mining: Models, Algorithms, and Applications* (pp. 337–357). New York, NY: Springer New York.

Large, R. (2006). *Strategisches Beschaffungsmanagement eine praxisorientierte Einführung ; mit Fallstudien* (Vol. 3). Wiesbaden: Gabler.

Lasch, R., & Janker, C. G. (2005). Supplier selection and controlling using multivariante analysis. *International Journal of Physical Distribution & Logistics Management*, *35*(6), 409–425. doi:10.1108/09600030510611648

Lazzarini, S. G., Chaddad, F. R., & Cook, M. L. (2001). Integrating supply chain and network analyses: The study of netchains. *Journal on Chain and Network Science*, *1*(1), 7–22. doi:10.3920/JCNS2001.x002

McGinnis, M. A., & Vallopra, R. M. (1999). Purchasing and Supplier Involvement: Issues and Insights Regarding New Product Success. *Journal of Supply Chain Management*, *35*(3), 4-15. doi:10.1111/j.1745-493X.1999.tb00057.x

Möller, K., Rajala, A., & Svahn, S. (2005). Strategic business nets—their type and management. *Journal of Business Research*, *58*(9), 1274–1284. doi:10.1016/j.jbusres.2003.05.002

Musser, J., & O'Reilly, T. (2007). *Web 2.0: Principles and best practices*. [Sebastopol, Calif: O'Reilly Media].

Numagami, T. (1998). The Infeasibility of Invariant Laws in Management Studies: A Reflective Dialogue in Defense of Case Studies. *Organization Science*, *9*(1), 2–15.

Pichler, F., & Wallace, C. (2007). Patterns of Formal and Informal Social Capital in Europe. *European Sociological Review*, *23*(4), 423–435. doi:10.1093/esr/jcm013

Poirier, C. C., & Bauer, M. J. (2001). *E-supply chain: Using the Internet to revolutionize your business : how market leaders focus their entire organization on driving value to customers* (1st). San Francisco: Berrett-Koehler. Retrieved from http://www.worldcat.org/oclc/47934103

Provan, K. (1993). Embeddedness, interdependence, and opportunism in organizational supplier-buyer networks. *J. of Management*, *19*(4), 841–856. doi:10.1016/0149-2063(93)90030-Q

Rai, A., Patnayakuni, R., & Seth, N. (2006). Firm Performance Impacts of Digitally Enabled Supply Chain Integration Capabilities. *MIS Quarterly*, *30*(2), 225–246.

Rauch, J. E., & Trindade, V. (2002). Ethnic Chinese Networks in International Trade. *Review of Economics and Statistics*, *84*(1), 116–130. doi:10.1162/003465302317331955

Richter, A. & Koch, M. (2007). *Social Software - Status quo und Zukunft* (Bericht 2007-01).

Roland, F. (1993). *Beschaffungsstrategien-Voraussetzungen, Methoden und EDV-Unterstützung einer adäquaten Auswahl* (Dissertation). Georg-August-Universität, Göttingen.

Ruan, D., Freeman, L. C., Dai, X., Pan, Y., & Zhang, W. (1997). On the changing structure of social networks in urban China. *Social Networks*, *19*(1), 75–89. doi:10.1016/S0378-8733(96)00292-4

Saxenian, A. (2002). Transnational Communities and the Evolution of Global Production Networks: The Cases of Taiwan, China and India. *Industry & Innovation*, *9*(3), 183–202. doi:10.1080/1366271022000034453

Schrödl, H. (2010). Value enhancement of strategic supply networks for value bundles through digital social networks. In *Proceedings of the 10th International Conference on Electronic Business (ICEB)* (pp. 35–41). Shanghai, China.

toocle.com. (2010a). *2010年度中国电子商务市场数据 监 测 报 告*. Retrieved from http://b2b.toocle.com/zt/upload_data/down/2010dsjc.doc

toocle.com. (2010b). *Commodities Market Report*. Retrieved from http://b2b.toocle.com/zt/upload_data/down/2010bs0.pdf

toocle.com. (2010). *1997-2009：中国电子商务十二年调查报告专题*. Retrieved from http://b2b.toocle.com/zt/1997/

Vanderhaeghen, D., Fettke, P., & Loos, P. (2010). Organizational and Technological Options for Business Process Management from the Perspective of Web 2.0. *Business & Information Systems Engineering*, *2*(1), 15–28. doi:10.1007/s12599-009-0087-7

Walters, D. (2004). New economy – new business models – new approaches. *International Journal of Physical Distribution & Logistics Management*, *34*(3), 219–229. doi:10.1108/09600030410533556

Williams, L., Esper, T., & Ozment, J. (2002). The Electronic Supply Chain: Its Impact on the Current and Future Structure of Strategic Alliances, Partnerships and Logistic Leadership. *International Journal of Physical Distribution & Logistics Management*, *32*, 703–719.