Chapter 16
The Influence of Socially Orientated Growth of Virtual Teams: A Conceptual Model

Iain Reid, Marina Papalexi, and Neil Slater

Abstract The rapid advancement of new technologies has resulted in greater opportunities in innovation, new product development partnerships/collaborations and international trade. Today's social networking and 'open innovation' information communications technology has enabled work distribution to become more efficient and has presented organisations with a new way of working across different geographical locations. The chapter aims to explore social software and presents a conceptual model for virtual teams (including social networks) for socially orientated growth in complex management projects in where third parties play a critical part to the supply chain.

Keywords Social software • Virtual teams • Social media • Social communications

16.1 Introduction

Over the last few years, academics and practitioners alike have increasingly focused on the performance of their projects and the potential disruptions within their global supply chain. Any risk regarding the performance of a project or supply chain draws on many decisions. Today's project-driven organisations now operate closer within a global suppwly chain structure and are often exposed to higher levels of diverse information and are therefore vulnerable to higher levels of uncertainty. This uncertainty and disruption may harm the outcome of the project, in terms of value and performance, as well as disrupt the communication flow within the supply chain. For example, Thun and Hoenig (2011) stated that supply chains are vulnerable from

I. Reid (✉) • M. Papalexi
The Business School, University of Huddersfield, Queensgate, Huddersfield HD1 3DH, UK
e-mail: i.r.reid@hud.ac.uk; m.papalexi@hud.ac.uk

N. Slater
The Business School, University of Huddersfield, Queensgate, Huddersfield HD1 3DH, UK

EUMETSAT, Queensgate, Huddersfield HD1 3DH, UK
e-mail: neil@slateronline.net

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a project management perspective. Furthermore, Tse and Tan (2011) suggested that product quality risk practices, supplier chain quality management, participation and supplier selection have also been affected through globalisation, whilst Cheri, Whipple, Closs and Voss (2011) explained that supply chain disruptions pose an increased risk and that supply chain design strategies can be implemented to mitigate this risk. In a similar vein, effective risk management requires decision makers to rank and prioritise a portfolio of risk factors involved in the supply chain (Enyinda, Mbah, & Ogbuehi, 2010). Furthermore, numerous authors have explained that global supply chains are growing in both length and complexity, and the business turbulence that they experience is increasing (Blackhurst, Craighead, Elkins, & Handfield, 2005; Pettit, Croxton, & Fiksel, 2013). This is more evident with the current global economic and financial crisis and underscores the importance of well-developed and well-managed risk procedures and structures in all industries of developing countries (Enyinda et al., 2010).

The aim of this research intends to examine whether the social network medium can foster a similar integrated team ethos (Khungar, 2012) for geographically dispersed virtual project teams and how such social network implementations can be optimised in order to support the external parties involved in complex project environments. The focus of the research also offers a conceptual model for communications support systems (including social networks) and discusses the impact on resources to enhance proactive and preventive strategies through the collective experiences of individuals and teams to develop the organisation's capabilities through the facilitation and crafting of the lessons learned during 'live' projects.

16.2 Managing the Project's Supplier Network

Today, companies are aiming to develop their effective inter-project learning practices in order to improve their competitiveness, since these learning practices are intangible knowledge-based assets, through based traditional information sharing. With the increasing adoption of new technologies to enhance the knowledge transfer and information flow, the goal of any project team members is to achieve the project outcome through the application of technical and management capabilities in environments necessitating an integration of their resources and efforts (Jugdev & Mathur, 2013). Through the collective experiences of individuals will develop the organisation's capabilities through the facilitation and knowledge sharing across all stakeholders involved in the project.

Within such project-driven environments, certain attributes are nonphysical such a software development; the challenge is therefore to help facilitate collaborations and knowledge sharing in support of the decision-making process. Project-based organisations have traditionally focused on improving their operations through performance monitoring and measurement, although more attention has been put on financial measures and on measuring. In today's global supply chains, developing products and services has become more of a social activity in where developers have to work together collaborating and sharing resources as well as their knowledge.

Modern communication tools and the Internet services have allowed for and fostered a less localised business environment to a situation where virtual teams (VT) can be formed without concern for geographical locations and time zones (Hastings, 2008).

Through the rapid growth of technology, organisations and individuals have been allowed to use social software in order to productively communicate and collaborate (Bradley, 2010). Social media refers to a constellation of shared technologies that derive their value from the participation of users through directly creating original content, modifying existing material, contributing to a community dialogue and integrating various media together to create something unique (Tapscott & Williams, 2007). Kim (2009) highlighted that there is a need to improve the communication between co-workers, suppliers, stakeholders and customers. The use of social networks could enhance employees' passion and creativity which has an impact upon organisational productivity (Chui et al., 2012). This mass phenomenon has been adopted almost in any processes carried out by companies, such as product development, marketing and customer service; more than 1.54 billion dollars were invested for the social software implementation and support (Bruhn, Schoenmueller, & Schäfer, 2012). However, further research is required on the investigation of risks related to the use of social software in a project management environment; this could include aspects of social knowledge environments and knowledge protection, privacy regulations and development of the technical tools to be able to address the risks (Pawlowski et al., 2014).

16.2.1 Communication Networks in Virtual Teams

Considering that the majority of firms, on the one hand, operate nationally and internationally and on the other hand adopts hierarchical structures (Weinberg, de Ruyter, Dellarocas, Buck, & Keeling, 2013), difficulties have been occurred in sharing information and creating collaborations (Tsai, 2001, 2002). In addition, Gartner (2013) identified that 90 % of collaborative-technology initiatives fail because they adopt an inappropriate practice approach. Therefore, consensus is yet to form on the best way of adapting the online communication platforms by organisations and the changes related to processes, structures and culture that these initiatives might occur. For example, Weinberg et al. (2013) suggested a set of principles that can guide firms to adopt social software to successfully be transformed into social businesses in support of project management initiatives. This fact might enable a more competitive environment to be developed within collaborative project management that often relies on the level of trust within the community. Daim et al. (2012) recommended that dispersed work groups have to deal with a number of issues:

- Cultural differences
- Communication issues
- Weak leadership
- Technical issues
- Building trust

Daim et al. (2012) also observed that electronic communication between remote team members is challengeable due to the differences on members' culture, language and attitude that can lead to misunderstandings and as a result have an impact upon organisational productivity. They also identified that face-to-face communications can therefore overcome some of those issues because members could use their additional communication skills such as the tone of their voice, facial expressions or body language. They continued by explaining that asynchronous collaboration contributes in completing certain tasks more quickly. However, in complex projects, weak leadership has been observed with individuals' roles and goals to be vague. Pawlowski et al. (2014) agreed with the Daim et al. (2012) five issues, regarding the development of collaborative communities, and they added to them the element of knowledge protection and legal dimensions. It is known that organisations are very cautious about sharing their core knowledge (Müller & Stocker, 2011); knowledge protection is difficult to be achieved through using social software (Väyrynen, Hekkala, & Liias, 2013). Finally, they discussed the numerous asynchronous and distributed tools that are available and the criteria on which firms base their decision highlighting the risk of adoption diverse and incompatible tools (Onyechi & Abeysinghe, 2009). In order to combat, this social media usage needs to become an accepted part of the firm's communication structure, and organisations need to create a way of working that balances between openness and closeness. With this balance in place, the organisation can exploit the capabilities created by social media whilst ensuring sufficient protection against information leakage (Ooms, Bell, & Kok, 2015).

16.2.2 Social Media

Literature indicates that social media will aid the innovation by fostering enhanced creativity, expertise and collective intelligence (Mount & Garcia Martinez, 2014). However, Braithwaite and Patterson (2011) stated that social media can be a difficult medium to understand, and it can be difficult to accurately interpret meanings, attitudes and motivations. It will also contribute to open and dynamic innovation by facilitating interaction and knowledge sharing across organisational boundaries (Jalonen, 2014). It is widely acknowledged that social media will help to build the in-house research knowledge base, organisational coordination and social climate that will increase the absorptive capacity of an organisation and aid its innovation efforts (Ooms et al., 2015); however, there is a general reluctance to participate in social media communities due to a fear of potentially losing important knowledge. Organisations that access these communities and exploit the information and consumer experiences discussed there should find it easier and more cost-effective to cocreate value through 'co-innovation' (Bugshan, 2015). However, organisations can also be challenged by the sheer volume of the content on the social media sites. However, there are additional challenges around how to find and manage the online contributors, how to compensate them for their ideas and input and how to involve

online contributors in the development process. For example, members of online communities innovate through interaction with other like-minded people, and a small number of community members were found to be very knowledgeable, highly skilled and able to create their own virtual high-quality and innovative products (Fuller, Jawecki, & Muhlbacher, 2007). Bengtsson and Ryzhkova (2013) later identified that social media is particularly useful in the idea generation stage where it can greatly improve both the speed and quality of the ideas. Due to the very nature of the online communities, isolating contributions from particular demographic samples can be problematic generated (Mount & Garcia Martinez, 2014).

16.2.3 Social Networks and Virtual Teams

Although the benefits of social networks and virtual teams are well documented, numerous articles have been dedicated to discuss the new trend of social networks and their impact upon organisations' effectiveness and efficiency and especially upon the productivity of teamwork (Weinberg et al., 2013). The spread of virtual teams within existing organisational structures and project-driven environments has evolved over the last decade. Social media remains an area that has not been investigated to a satisfactory degree but can be a good source of innovation in the new product development process (Bugshan, 2015). The rationale behind this research focus is based on the fact that firms have been shifted from 'a production orientation to a networked structure' (DiMaggio, 2003), which means that collaboration and information/knowledge sharing create the value (Vargo & Lusch, 2004). Culnan, McHugh and Zubillaga (2010) stated that a survey conducted by McKinsey in 2009 showed that about 64 % of 1700 worldwide companies have used social networks for improving the internal communications. In a similar vein, Barnes and Mattson (2009) found that 52 % of the firms, participated to their survey, are considered those networks as effective tools in their business. The opportunity for prescriptive studies and the analysis of internal projects have gained some traction over the past few years. Törlind and Larsson (2002) discussed how a web portal (featuring email, webcams, instant messaging and SMS) promotes online discussion awareness of project progression between colleagues. In terms of a global snapshot of digital statistics (Chaffey, 2016), presented a global digital snapshot 2.3 billion people use social media with 3.4, billion internet of which 1.9 billion people are active mobile social users. With open access to expertise, knowledge and data enable employees from different disciplines within a firm to collaborate and as a result be more productive, satisfying the market demand (Labrecque et al., 2013). The challenge is to integrate this usage in a more commercial sense of communicating of business decisions.

Currently, social networks play a pivotal role in exchanging information between departments and business units (Goh, 2002). Organisational department used to apply their own systems and collect only their own data; being transparent by sharing information through collaborative communities improves organisational

productivity and supports innovation (Gulati, 2007). Furthermore, Carmal and Agarwal (2001) anticipated to the growth of virtual teams to allow functionally diverse and/or geographically dispersed individuals to collaborate as teams in order to deliver a project or service, compared to the more traditional concept of having team members in one location. Furthermore, Straub and Welke (1998) indicate that the primary line of defence for security is policy, yet the lack of legal frameworks for much of social media and the empowerment required to yield the benefits create security risks. The rapid growth of virtual teams has resulted in cost savings, optimised participation and consolidation of diverse ideas and competencies across various geographical locations, allowing new ways of working both in executing new projects and conducting day-to-day business. Giuffrida and Dittrich (2015) identified that traditional forms of communication such as email and phone and videoconferencing systems are the foundation to modern-day communication; however, today's communication takes place mainly in distributed teams through the so-called social software (SoSo). SoSo is often referred to as 'social media', 'web 2.0' and 'user-generated content' by practitioners and researchers. The research will test the hypothesis suggestion that tight integration at an interpersonal level between individuals within a team is able to deliver an increased level of performance (Cogliser et al., 2013) and whether the VT can deliver such integration through SoSo. The use of SoSo facilitates the communication process between the members of collaborative communities, makes their contribution more transparent and perhaps increases the level of trust (Simula & Mervi, 2012). For instance, Giuffrida and Dittrich (2015) study identified instant messaging to be the most popular form of SoSo, allowing instantaneous effective and efficient communication, as seen in Fig. 16.1. They reported that various other types of SoSo are

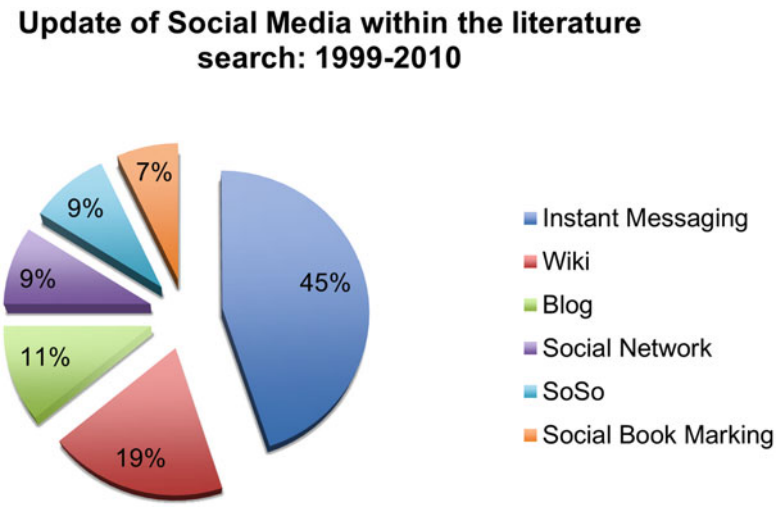

Fig. 16.1 The uptake of social software through the literature (adapted from Giuffrida & Dittrich, 2015)

more recent, owing to their late spread in mainstream usage. Furthermore, culture is not a significant moderator between trust and individual behaviour; it implies that when practitioners develop cross-culture, businesses do not need to consider cultural factors of individuals first. However, the importance of culture in influencing behaviours on such SoSo platforms can be ignored. In addition to this, the level of trust is gradually increasing within the communities through sharing beliefs and values (Dubé, Bourhis, & Real, 2006).

Although the use of SoSo improves the communication between the members of a collaborative community and, as a result, enhances organisations' effectiveness and efficiency, it also benefits individuals. Especially, individuals' characteristics and expertise are easily realised and highlighted which might create personal opportunities for those individuals (Weinberg et al., 2013). Besides, focusing on the workload, processes can easily be refined, redesigned and updated; for example, wikis supports and develops process documents, promoting transparency and connection between them (Weinberg et al., 2013). What is more, the members of a community or project can have a better understanding and visualise the progress by exchanging videos or images. Inherently, a social capital store can be gradually developed (Nambisan & Watt, 2011) which is more useful and powerful than offline word of mouth (Hennig-Thurau et al., 2004). Overall, the use of social networks by organisations creates an open organisational structure promoting transparency and overcoming hierarchies.

The authors believe that the literature on social media platforms provides rich theoretical perspectives to SoSo and contributes insights on how this shared learning can be made more effective within a dispersed project team environment. For example, Harrin (2011) carried out one such study with 181 respondents from 32 countries on how project managers use social media tools in a project environment. A summary of the key findings is presented in Table 16.1. The report concluded that project managers should be taking advantage of the available tools for stakeholder and team communication and collaboration.

The data highlighted that 60 % of Project/Program Support employees do not use blogs or wikis. Only half of change management professionals and 48 % of programme

Table 16.1 Uptake of social media tools (Adapted from Harrin, 2011)

Tool	Business use (%)	Personal use (%)	Don't use (%)	Don't know what this is (%)
Facebook	24	85	13	1
LinkedIn	72	46	6	2
Other social network	20	24	56	6
Twitter	42	47	38	1
Instant messaging	56	56	23	0
Blog	45	39	39	0
Wiki	41	25	46	1
Podcast	21	26	60	3
Video podcast	18	14	71	4

managers use blogs and wikis for business use. However, Project/Program Support employees may find that wikis are great tools for managing project knowledge artefacts, and there appears to be scope for wider use of wikis in this role. The objective of this research is to leverage these insights from the social media platform to make project management environments more effective through improved intra-project and inter-project shared learning as well as to initiate a foundation for empirical research.

16.3 Conceptual Framework for Socially Orientated Growth of Virtual Teams

Generally speaking, the communication activity is considered as one of the most important areas in project management as influencing so many decisions behind the management of resources, scope of supply, innovation, commercial and legal awareness. Project-driven organisations are designing SoSo services according to their customers' and suppliers' expectations and interventions. Therefore, a structured conceptual framework is presented in Fig. 16.2, which addresses both the strategic and operational level of social media and social communication.

The framework presents the practical implications of disruptive technologies, virtual teams, social media and social communications and subsequent key factors derived from a literature review. The findings demonstrate the use of modern communications support systems to facilitate communication channels within VT, and that these technologies also require a far deeper understanding of the positive and negative impacts when project teams move to environment where the traditional team platform is no longer the norm.

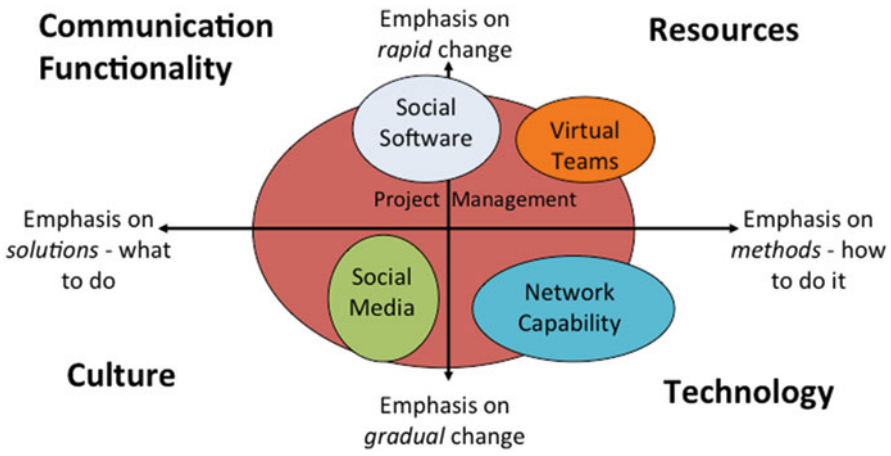

Fig. 16.2 Conceptual model for socially orientated growth of virtual teams

16.3.1 Communication Functionality

Successful collaborative communities are only created by achieving a balance between pure self-interest and altruism (Weinberg et al., 2013). This balance can be reached through an agreement on the communities' vision and the development of trust (Adler et al., 2011). Social software has been defined as web-based platforms that enable users to share information and contribute to collaborative community of participants (Pentina, Zhang, & Basmanova, 2013); a typical classification of these tools includes social networks, blogs and wikis. Deloitte stated that '*social tools that drive collaboration and information sharing across the enterprise and integrate social data into operational processes*' (see Kiron, Palmer, Nguyen Phillips and Berkman, 2013, p. 5). Although asynchronous collaboration applications were introduced as a weapon used by marketers to promote a brand, they are accepted also as a powerful management tool which aim is to facilitate and perhaps improve teamwork and workflow (Weinberg et al., 2013). However, making sense of the mass of relational data ('who knows who') produced by social media sites is becoming increasingly possible for nontechnical audiences.

16.3.2 Culture

Overall, the use of social networks by organisations creates an open organisational structure promoting transparency and overcoming hierarchies. Although the use of social software improves the communication between the members of a collaborative community and, as a result, enhances organisations' effectiveness and efficiency, it also benefits individuals. Especially, individuals' characteristics and expertise are easily realised and highlighted which might create personal opportunities for those individuals (Weinberg et al., 2013). Furthermore, culture is not a significant moderator between trust and individual behaviour; it implies that when practitioners develop cross-culture business, they do not need to consider cultural factors of individuals first. However, the importance of culture in influencing behaviours on such SoSo platforms can be ignored.

16.3.3 Technology

Although several studies indicate that social software can improve team communication and collaboration sharing important information and knowledge (Levy, 2009; Zheng, Li, & Zheng, 2010), the risks associated with the use of those tools need to be aware from the users as the ways of minimising them (von Krogh, 2012; Väyrynen et al., 2013). For example, Kietzmann, Hermkens, McCarthy and Silvestre (2011) presented seven functional building blocks: identity, conversations, sharing, presence, relationships, reputation and groups presented a number of

recommendations regarding how firms should develop strategies for monitoring, understanding and responding to different social media activities. However, our knowledge of how to apply network analysis to gain practical insights from social media networks of individuals and organisations is still in its infancy.

16.3.4 Resources

The spread of VT within existing organisational structures and project-driven environments has evolved over the last decade. Carmal and Agarwal (2001) anticipated to the growth of VTs to allow functionally diverse and/or geographically dispersed individuals to collaborate as teams in order to deliver a project or service, compared to the more traditional concept of having team members in one location. In terms of the resource-based view of the firm, Jugdev and Mathur (2013) stated that an intangible knowledge base can serve as a source of competitive advantage because they tend to be unique to the company, but difficult to copy, and are culturally embedded. It is therefore important to examine how project participants share what they learn and to address how this learning might be better enabled. Therefore, SoSo models could be also created for analysing what is happening on a project and influencing the decision-making processes (Giuffrida & Dittrich, 2015). To do so, data collection and data analysis are critical. Without the required information, it is difficult to capture the current situation and go beyond the project's supplier network. As described above, social networks can be used to facilitate key data into information and support the decision makers to enhance VT knowledge in order to optimise the design, planning and control and improvement decisions, which will lead to the increase robustness of the project.

16.4 Discussion

Making sense of the mass of relational data ('who knows who') produced by social media sites is becoming increasingly possible for nontechnical audiences. The literature identifies the adoption of social media and provides possible improvements in relationships through the ability of tools to increase the awareness, transparency and response rate of the individuals involved in VT environment such as a complex hi-tech project. However, trust and risk have been affecting individual behaviour towards the adoption and application of SoSo/social media platforms (Wang, Min, & Han, 2016) which requires further investigation.

According to Wang et al. (2016), virtual communities are easier to adopt rather than social networking sites; therefore, as a bridge connecting vendors and individuals, platform providers need to develop their business strategies on virtual communities or build virtual communities beforehand. The ideal proposition is that a balanced approach to the two aspects of 'disruptive technologies' and 'social

communications' provides the required ground for managing disbursed VT in order to develop their capacity to identify valuable knowledge in the environment, its assimilation with existing knowledge and the exploitation phase for successful project management. Designing a VT around the disruptive technologies and social communications results in both product improvements and enhancing team working more effectively. The authors believe that the literature on social media provides rich theoretical perspectives to contribute insights on how this shared learning can be made more effective within a project-based environment.

The result of the initial analysis highlights the relevant issues that such a framework needs to address the design of SoSo in diverse project teams in order to manage the operations and finally improvement communication functionality, allocation of resources, technology and culture. A number of themes were conceptualised through a holistic approach to a future-proofing SoSo awareness model, with a view to developing a structured framework. In particular an approach is proposed for strategy assessment in which the growth strategy is assessed by evaluating possible VT strategies.

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