Introducing a New Approach combining Communicative Capabilities and Social Software for an Optimized Handling and Improved Transparency of Virtual, International Projects

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Summary

Research questions: Is the overall project handling of virtual, international projects correlated with specific communicative capabilities of the project leader supported by selected elements of Social Software? Is the overall project transparency of virtual, international projects correlated with the usage of specific elements of Social Software?

Methods: A quantitative research approach has been chosen to test the given hypotheses. Therefore, a questionnaire was created to collect data from the defined target group in order to evaluate the relationships among the different variables (correlation analysis) of the research questions.

Results: The developed and revised model shows that project leaders of virtual, international projects need to take care of improving their dimensions Motivation, Trust, Identity, Conflict Management, Coaching, Vision, Understanding, Knowledge, Awareness, Collaboration, Empathy, and Culture in order to increase the efficiency of virtual, international project handling. Elements of Social Software can be mostly ignored by project leaders as they currently do not have a benefit for the handling of those projects. In order to improve the project transparency over several virtual, international projects, project leaders have to use other tools instead of Social Software at present.

Structure of the article: 1. Introduction; 2. Literature Review; 3. Development of the Model; 4. Hypotheses & Methodology; 5. Empirical Results; 6. Conclusion & Recommendation; 7. About the author, 8. Bibliography

1. Introduction

The world of work becomes more and more international leading to an increased number of international projects, where cultural cooperation is indispensable (Hößler & Sponfeldner, 2012). According to Cronenbroeck (2004), international projects are the next evolutionary level following national projects, where technical and social problems are more complex to solve. Furthermore, in a more and more demanding environment, companies need to be agile to stay competitive on the market so that the ability for effective and efficient distributed collaboration increasingly gains in importance (Koch, 2011). Also, instead of collocated handling, a rising number of projects nowadays are handled virtually due to the globalization (Oertig & Buergi, 2006).

In general, virtual teams “are groups of geographically and/or organizationally dispersed coworkers that are assembled using a combination of telecommunications and information technologies to accomplish an

organizational task" (Townsend, DeMarie, & Hendrickson, 1998, p. 18). Thereby, the degree of virtuality needs to be considered. Griffith, Sawyer, and Neale (2003) differentiate between traditional, hybrid, and pure virtual teams according to three dimensions: (1) Degree of technological support, (2) the share of work (in percent) of a team, where members are involved, who work distributed in terms of space and time, and (3) degree of physical distance. So, according to this degree of virtuality, a team can be classified on a range between slightly or extremely virtual (Cohen & Gibson, 2003). In the context of this work, the virtuality is allowed to be between hybrid and pure virtual project teams.

With regard to virtual project teams, technology plays an important role being an enabler (Verburg, Bosch-Sijtsema, &Vartiainen, 2013) as such teams have to use Information and Communication Technology (ICT) for coordination, communication, and relationship building purposes (Montoya, Massey, Hung, & Crisp, 2009).

In addition, compared to collocated teams, virtual teams are facing a lot more of challenges (like for example language or cultural barriers, or coordination barriers due to time and distance differences) leading to the point that a virtual team leader needs to have the same competencies as a normal team leader and beyond (Malhotra, Majchrzak, & Rosen, 2007).

2. Literature Review

This chapter represents the three knowledge pillars this work is built upon: Stakeholders, Communication, and Social Software. Stakeholders are the most important resource to do projects at all, but without communication, stakeholders are not able to work together. Thereby, tools of IT assist in communication between stakeholders, especially when projects are distributed over several locations. Social Software, as a relatively new sub group of IT, offers big chances to optimize normal projects in general, and virtual projects in particular as this software is perfectly suited to cover the needs of people and to link people to each other through new forms of electronic communication.

Stakeholders

In general, stakeholders (also known as interested parties) are "people or groups, who are interested in the performance and/or success of the project, or who are constrained by the project" (Caupin et al., 2006, p. 42). These stakeholders are of central importance for today's projects. In contrast to the past, the project managers of today have to focus especially on the humans being involved in a project as the humans are essential contributors to project success; therefore, the project managers have a big new challenge to handle (Cronenbroeck, 2004) as people are one of the most difficult parts of a project (Campbell, 2009). In fact, humans are more difficult to read due to their complexity compared to numbers, but they in particular create the added values in projects (Lechner & Hanisch, 2008). This is because knowledge and work being the most important categories of performance within projects are tied to specific individuals (Huber, Kuhnt, & Diener, 2011).

In the literature, different stakeholder roles are differentiated during project work. Campbell (2009) mentions four key groups of people at a high level: (1) Executive management and sponsor, (2) working committee, (3) operations/users, and (4) other stakeholders. More in detail, Nagel (2012) summarizes the main stakeholders into the project team, sponsor, steering committee, top management, public, customers, managers, and employees. Thereby, the project team members can be divided into internal and external members (Preißner, 2004). Scheuring (2013) further adds some other interesting roles like the project owner (mostly equal to the project sponsor), sub-project leader, contractors, system operators, beneficiaries and objectors. As communication within projects is a key element, Campbell (2009) emphasizes to make specific stakeholders, who are communication experts, responsible for important project communication tasks besides the project leader. In many cases, it even makes sense to nominate a project communications manager being in charge of all communication activities taking place in all project phases (Nagel, 2012).

The stakeholders mentioned in the last section in fact are only general descriptions of roles participating in projects. In every project, some or most of these roles are brought to life by humans. To find and take care of the right stakeholders, various tools are available. A widespread tool for identifying and handling of stakeholders is the stakeholder management. This includes identifying, analyzing and assessing of stakeholders in order to ensure an optimal dealing with them and is a permanent task of project management (Scheuring, 2013). Then, a key element is to concentrate

on the most important and influential stakeholders after clustering them into four categories (Nagel, 2012): High influence and negative attitude (first priority), high influence and positive attitude (second priority), low influence and positive attitude (third priority), and low influence and negative attitude (fourth priority). Thereby, the development of suitable strategies for communications in order to win the relevant stakeholders is also recommended (Ahlemann, Smolnik, Müller, & Radeke, 2008). In addition, changing the stakeholder roles in form of a role game can help promoting the mutual understanding of expectations between stakeholders (Andler, 2008). In contrast to traditional stakeholder management, Huber et al. (2011) recommend a proven three-stage procedure to conduct an analysis of the project environment from a social point of view (social success factors): (1) Analyzing of stakeholders, (2) analyzing of potential problems, and (3) monitoring and planning of measures. Not to forget, Assudani and Kloppenborg (2010) emphasize the dynamically changing importance of stakeholders during the different project life cycles and therefore suggest using the theoretical tools of stakeholder and social network theories to address this issue. Thereby, Kolb (2012) highlights in particular the importance of creating a monitoring process to observe this dynamic project environment.

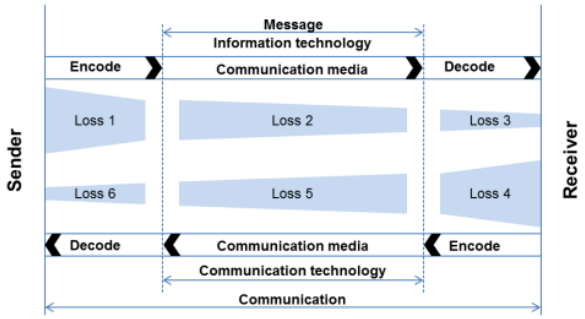
It is not a secret that meeting the needs of different stakeholders is crucial for project success (Cronenbroeck, 2004). Especially the expectations, which have not been discussed consciously during the stakeholder analysis may present a risk regarding the stakeholders' acceptance of the results being created by the project (Dittmann, 2013). Generally spoken, different stakeholders pay attention to different questions as for instance what the risks and chances are for employees or how the project success contributes to the success of the whole company (Nagel, 2012). Those questions or expectations are based upon basic characteristics each individual has (Baker, 2012c): Need (when something important is missing), want (when a person wants more of what this person has), abilities (helping to meet needs), limitations (limiting or blocking from meeting needs), values (essential way of behaving), and self-awareness (to be aware of being aware). In particular with regard to the needs of a human being, Maslow (1943) originally defined a hierarchy of needs (bottom-up approach) being a source for human motivation: Physiological, safety, love/belonging, esteem, and self-actualization. Understanding those basic principles will help project leaders to better meet the expectations and needs of the respective stakeholders involved in the current project.

Communicative Capabilities

Communication or sharing information is the primary energy for an organization to move forward effectively as it connects all involved parts (Baker, 2013a). This is also valid for temporary organizations (projects), where good communication is necessary to direct all project team members on the common project objectives (Huber et al., 2011). Thereby, the project leader always is the central point of information sharing within the project, whereby information generally has to be handled and prepared according to the specific target group (Kolb, 2012). The main objective of project communications management is to take care of that every stakeholder gets the necessary information on time and appropriately she or he needs in order to act successfully within the project (Streich & Brennholt, 2012). Furthermore, the communication should be effective (the message someone intended is understood accurately) and efficient (in the least amount of time, the message is transmitted accurately) as stated by Fadil (2013).

Cronenbroeck (2004, p. 186) illustrates the communication process between sender and receiver, which highlights especially the general challenges of communication. This is depicted in figure 1.

Figure 1:
Communication process with losses according to Cronenbroeck



It can be seen easily that in this process there are many places, where information can get lost or can be falsified, which can lead to conflicts in projects (Cronenbroeck, 2004). Thereby, the decoding and encoding process needs to be addressed in particular. As

indicated by Henderson (2008), the productivity and satisfaction of team members is significantly correlated to the competencies of a project leader to decode and encode communication. Moreover, communication can take place in different forms. For example, Weimann, Hinz, Scott, and Pollock (2010), differentiate the following communication media: Face- to-face, video conferencing, phone, chat, email, text messaging, and written documents. Thereby, communications can be grouped basically into synchronous (at the same time, for example phone) and asynchronous (time-delayed, for example email) communication (Bohinc, 2014).

Compared to traditional teams, two of the main four challenges of virtual teams (beside culture and different time zones) are communications and technology (Kayworth & Leidner, 2002). This is because the electronic media are used in particular as interactions via face-to-face are rare (Malhotra et al., 2007). But compared to face-to-face communication, electronic media can lead to a poorer communication as information parts (for example transferred by facial expressions or body language) are missing (Hertel & Orlikowski, 2012). So, misunderstandings can occur more easier, which can lead to difficult problems further on (Duran & Popescu, 2014). Based upon the work of Daft and Lengel (1986) and Maruping and Agarwal (2004), Hertel and Orlikowski (2012) mention the Media Richness Theory (MRT) to decide which form of communication is appropriate for a specific situation. The higher the uncertainty or ambiguity of a situation is, the more information richness a communication media should have (Hertel & Orlikowski, 2012). Thereby, the medium with the most richness is face-to-face while email for example is one of the media with low richness (Weimann et al., 2010). Beside media richness, also urgency, the formality of a message, limitations of media, preferences of audience, and cost play an important role for selecting the best medium (Bovée & Thill, 2012). To sum up shortly, communication is of central importance being the core of projects (social systems) as it serves not only the coordination of tasks, but also a lot of other dimensions like for example the motivation of the involved people (Huber et al., 2011).

Motivation

Motivation as a leadership task is used very often despite of the fact that it probably is the least understood among all leadership tasks (Desjardins & M. Baker, 2013). Thereby, losses of motivation have to be avoided or reduced related to project team members as they can negatively influence any individual work in projects (Brodbeck & Guillaume, 2012). Thereby, especially the individual needs of the project team members according to the pyramid of needs (Maslow, 1943) have to be addressed by the project manager in order to create motivation (Schwinghammer, 2011). In particular, awareness about personal attitudes, intrinsic motivations, circumstances, and skills and experience of a person should be given by a project leader to motivate an individual intentionally (Caupin et al., 2006). Thereby, Majer and Stabauer (2010) mention the difference between intrinsic (satisfaction results directly out of work) and extrinsic (satisfaction results out of circumstances of work) motivation, and emphasize especially to take into account the crowding-out effect (intrinsic motivation is replaced partly or completely by extrinsic motivation) in projects. To sum up, a leader has to understand that the needs related to motivation are the same among all people, but the extent is different from human to human (Desjardins & Baker, 2013). Furthermore, a challenge is to find out, what each member of the team values taking cultural differences into consideration (Gibson & Cohen, 2003). In the research of Kayworth and Leidner (2002), also the motivation of team members was found to be one of the primary problems from the perspective of a virtual team leader. So, further factors enabling motivation especially for virtual projects according to Hertel and Orlikowski (2012) have to be considered, which are social tasks (for example getting to know each other), appreciation of contributions, creation of trust and identification, and to make the virtual project more transparent.

Trust

In general, trust is a central pre requisite for good collaboration and requires much time and energy of all involved people (Rattay, 2013). Besides poor communication, a lack of trust is the most cited reason, why the work of a team is unsuccessful (Bovée & Thill, 2012). Trust is an important factor contributing to the success of a team, whereby communication in particular is a key element establishing trust among project team members (Duran & Popescu, 2014). In contrast, Cheung, Yiu, and Lam (2013) found that trust has an influence on communication, which then affects the performance of projects. In their research paper with ad

hoc virtual teams, Altschuller and Benbunan-Fich (2010) mention that the performance and trust of such teams are positively influenced by virtual co-presence, whereby virtual co-presence is understood as "a subjective feeling of being together with others in a virtual environment" (Ma & Agarwal, 2007, p. 50) and which should be supported by suitable communication systems. In addition, Rusman, van Bruggen, Sloep, Valcke, and Koper (2013) identified the 15 most frequent personal information elements (for example experience at work or personal characteristics) for establishing trust among team members in virtual project teams. Further approaches for the project leader to increase trust in virtual teams are the development of binding rules for the handling of conflicts and communication, and the creation of sufficient opportunities for personal meetings of the team members (Hertel & Orlikowski, 2012).

Power

Power is a very important social soft factor as power has influence both on projects and within projects, which leads to the point that a project needs to build up his own power position in order to survive against the power constellations within his project environment (Huber et al., 2011). With power, interesting opportunities and influence are given, which can be used in a positive way for the project (Rattay, 2013). As the project leader usually has no formal power, she or he has to take care of establishing structures of power (usage of power sources), which then give power directly to the project leader (Huber et al., 2011). So, project managers normally have to lead their team laterally without disciplinary power as given in the line organization (Majer & Stabauer, 2010). According to Solga and Blickle (2012), project leaders need to understand first the important role power plays, and second, how to deal competently with the given political challenges. Based basically on the statements from Küng (2005), Huber et al. (2011) mention four informal power sources in projects for project leaders: (1) Information and communication channels are mastered, (2) organizational rules are used, (3) relationships with the environment are managed, and (4) technical skills, expertise, and knowledge are available. In addition, Solga and Blickle (2012) emphasize reputation, identification power (power by creating a sense of connection with related persons), and expert power (power by knowledge and skills) as being valuable for the project leader, whereby the mentioned power bases were originally defined in French Jr and Raven (1959). Although power and politics are much more mild and restrained in virtual teams compared to traditional teams, they also exist in those virtual settings and therefore need to be taken into consideration as well by virtual team leaders (Elron & Vigoda, 2003).

Identity

Gareis (2006) recommends the creation of a project identity so that the team members are encouraged to identify with the project and have an orientation for their actions. Thereby, the temporary social system (project) needs to define its boundaries regarding the environment to enable the creation of an identity at all (Huber et al., 2011). Kraus and Woschée (2012) emphasize the enormous importance of a strong identification (defining characteristic of own person) and a high commitment (emotional bond) for project success. According to Gareis (2006), such a high identification can be reached with the development of a project-specific culture (standards, rules, and values). Furthermore, team leaders should put effort in creating an overall target for the project the team members can believe in to increase team identity (Hinds & Weisband, 2003). Moreover, developing a project slogan or logo are helpful measures to establish a clear identity of the team (Gluesing et al., 2003). In their book, Earley, Ang, and Tan (2006) mention three elements to create a high level of commitment: (1) Agreement of rules for working together, (2) creation of common aims, and (3) definition of clear roles. Also essential is the fact that members contribute to the shaping of a project identity when they communicate about the project (Huber et al., 2011). Compared to traditional projects, establishing an identification for remote team members must have a greater attention by the project leader (Hertel & Orlikowski, 2012).

Conflicts

In accordance to Rattay (2013), personal conflicts (personality as cause), cultural conflicts (company cultures as cause), and structural conflicts (company structures or organization as cause) can arise during projects. Thereby, Cronenbroeck (2004) states that conflicts during projects are unavoidable so that the project manager has to be prepared sufficiently. So, it is recommended to set up a process for the handling of

crises and conflicts right at the beginning of a project (Caupin et al., 2006). In principle, conflicts are not negative as they make differences transparent and initiate changes (Rattay, 2013). But unfortunately, people rather tend to do not express differences and therefore remain silent instead of discussing differences due to a fear of negative consequences like for example a loss of status (Perlow & S. Williams, 2003). Hereby, sensitive communication skills of the project manager are very important to recognize signals related to this behavior in advance in order to avoid hidden conflicts (Cronenbroeck, 2004). Although it is not possible to resolve all found conflicts, it is important to use communication as a powerful tool to address them at all (Nagel, 2012). So, in contrast to the past, where even a leader often was a source of conflicts due to aggressive behavior, a modern leader rather has to manage conflicts appropriately (Desjardins & Baker, 2013). With reference to virtual projects, limitations of communications or communications media (misinterpretation of messages) and missing context information about the communication partner (for example missing information about the framework conditions or the current workload) are the reasons for a higher risk and a faster escalation of misunderstandings and conflicts (Hertel & Orlikowski, 2012). So, the authors summarize that an early identification of conflicts and misunderstandings in virtual projects is more difficult for the project manager because of distance and restricted communication.

Coaching

The full potential of people can be developed by applying coaching (Desjardins, 2013). According to Rattay (2013), project managers can use coaching in projects to extend their leading quality. Thereby, Desjardins (2013) emphasizes the high consumption of time needed for coaching, but also states that it is worth the effort in the long-term. Wastian, Braumandl, and Dost (2012) differentiate three types of project coaching: (1) Individual coaching (topics related to the project team member, for example tasks or relationships to others), (2) team coaching (topics related to the project team, for example collaboration and cohesion), and (3) process coaching (topics related to the project process and context, for example learning, transfer, and innovation). Thereby, the coach provides impulses to the coaching process in form of interventions like for example questions, tasks, or the collaborative creation of contents (Majer & Stabauer, 2010). Moreover, project coaching should contribute to the improvement of project processes, to achieve the goals set for team members, the team and the project, and to a conscious self-transformation and -development of project stakeholders and project teams (Wastian et al., 2012). The importance of coaching also rises for virtual teams. As mentioned by Furst, Reeves, Rosen, and Blackburn (2004), highly successful virtual project teams are searching actively for coaching sources. Thereby, Kayworth and Leidner (2002) found that effective virtual leaders provide coaching among other dimensions. So, project managers have to be more and more a virtual coach for their virtual project team members slipping into different roles according to the needs of their members (Blackburn, Furst, & Rosen, 2003).

Vision

A clear picture of the future, which is appealing and sensible is called a vision (Baker, 2013b). Thereby, information about the necessity for the change (why) and about the steps to realize it from a strategic point of view (how) has to be implemented into the vision (Baker, 2013b). Both the creation and maintenance of a project vision have been shown to be very important (Bourne & Walker, 2004). But according to Campbell (2009), only a few important stakeholders are aware of the rationale of a project at all. Furthermore, achieving a shared vision often fails due to ineffective project communications (Chen, Nunamaker Jr, Romano, & Briggs, 2003), although a common vision is a precondition to enable an efficient collaboration of project team members (Pallot, Prinz, & Schaffers, 2005). By sharing a vision, it becomes “their vision” so that people regard their performance as meaningful for the project and are motivated intrinsically (Baker, 2013b). Team members or followers have three requirements related to a vision: (1) The leader needs to develop a team vision, (2) needs to guide that people towards that vision, and (3) needs to communicate the mentioned vision to other people (Baker, 2012b). Moreover, fascination and authenticity as key characteristics have to be included into a vision to motivate team members finding ways on how to make the vision come true (Ancona, Malone, Orlikowski, & Senge, 2007). With reference to virtual teams, Tyran, Tyran, and Shepherd (2003) recommend in particular to

train leaders in electronic communication skills as the ability to inspire people by those forms of communications is critical.

Knowledge Management

According to Huber et al. (2011), knowledge is essential for the success of a project as the combination of knowledge of different team members leads to the creation of the product the project exists for. Winkler and Mandl (2012) confirm the relevance of the resource "knowledge" for an efficient project handling and propose to use knowledge management as a supportive measure for the optimization of project phases. Also, knowledge is mentioned as an important success factor to be considered by the project leader (Schwinghammer, 2011). The project leader is in charge of initiating and keeping the knowledge flow on track, whereby in advance an environment enabling and encouraging communication, and methods for transferring of knowledge are needed (Huber et al., 2011). Related to this continuous knowledge flow, Majer and Stabauer (2010) differentiate two types of learning in and from projects to gain new knowledge: (1) Personal (individual) learning and (2) organizational (temporary social system and company) learning. Thereby, it has to be ensured that knowledge management is embedded in daily routines, not only for documentation of knowledge, but to enable an unfiltered, direct, and unrestricted flow of knowledge based on communication between all involved stakeholders (Huber et al., 2011). Then, valuable knowledge will not get lost after the project has been completed like in the standard case, when there is a lack of time for creating documentation, exchanging experiences or doing reflections (Patzak & Rattay, 2009). Finally, new created knowledge enriched with made experiences within a project has be given back to the line organization (Huber et al., 2011). In virtual teams, it is important that the virtual project leader first takes care of developing an awareness about at which locations essential knowledge does exist or not, and second makes sure that the identified knowledge then is communicated among those locations (Hinds & Weisband, 2003). Furthermore, each of those people working distributed has unique knowledge, whereby an effective utilization of this knowledge has to be ensured by the project leader (Malhotra et al., 2007).

Awareness

In general, awareness is defined as "an understanding of the activities of others, which provides a context for your own activity" (Dourish & Bellotti, 1992, p. 1). In their article, Jang, Steinfield, and Pfaff (2000) are dealing with so called awareness needs encountered by virtual teams. They concentrate especially on four types of awareness deficits: (1) Deficit about activities of others, (2) deficit about availability of others, (3) deficit about process, and (4) deficit about perspective. In contrast, Carroll, Neale, Isenhour, Rosson, and McCrickard (2003) describe activity awareness as a concept based upon social (information about presence) and action (information about the progress of tasks) awareness, where important situational context information like for example interpersonal relationships or inter-dependencies is emphasized in particular. For Dustdar (2004), process awareness means that the members of a virtual project need information about the status related to the work packages of their colleagues. Jang et al. (2000) conclude that more awareness can influence how dispersed team members perceive the exchange of information and communication. Furthermore, team members are required to create and maintain awareness to enable effective collaboration (Carroll et al., 2003). Thereby, creating awareness among members can be positively supported by the project manager (Beranek et al., 2005).

Collaboration

For the success of a project, collaboration as a success factor is of central importance (Huber et al., 2011). Thereby, one of the most challenging requirements with reference to project teams is that the different team members need to develop a unit in a short period of time in order to work collaboratively for the common goals (Kauffeld, Grote, & Lehmann-Willenbrock, 2012). According to Bovée and Thill (2012), improving communication skills is worth the effort as there is a positively correlation between the quality and productivity of collaboration, and the communication capabilities of people working together. Also, in addition to the factors of taking responsibility, task accomplishment, social cohesion, and goal orientation (originally described in Kauffeld (2001)), Kauffeld et al. (2012) further mention the factors project leader, planning and controlling, and information and communication as significant for good collaborating teams. Focusing on the project leader, she or he is in

charge of the three following issues with reference to collaboration: (1) Creation of communicative spaces to maintain good collaboration, (2) introduction of beneficial topics for the collaboration into project communication and supporting them, and (3) ensuring that the collaboration with stakeholders is going well by taking care of the respective relationships (Huber et al., 2011). Regarding the composition of the project team, besides other important team roles like monitors, idea people, leader, and task-oriented people, especially the relationship-oriented people needs to be highlighted as they are essential for building collaboration and coordination (Baker, 2013b). But also the role of the team leader has to be emphasized as she or he has to take care of establishing a framework, which supports coordination and collaboration processes (Desjardins & Baker, 2013). Based upon on the research of Hertel, Konradt, and Voss (2006), the following summarized capabilities of project stakeholders play an important role for virtual collaboration in particular (Hertel & Orlikowski, 2012): (1) Readiness to trust, (2) creativity, willingness to learn, and flexibility, (3) tolerance in dealing with heterogeneity, (4) individual initiative and endurance, and (5) ability to communicate with electronic media. Finally, the execution and design of collaboration in virtual project teams has to be as efficient as possible due to the rising number of virtual projects (Beranek et al., 2005).

Emotional Intelligence

In contrast to practical intelligence (expertise) and Cognitive Intelligence (IQ), Baker (2012c) emphasizes emotional intelligence (social and emotional skills, and competencies) as a toolbox for a manager to be successful in a complex environment. According to the research of Goleman (2011), Emotional Intelligence (EQ) is the competency, which makes the difference between an average and a great leader. More in detail, he divides EQ into five components: (1) Motivation, (2) social skill, (3) self-regulation, (4) self-awareness, and (5) empathy. Professional dealing with emotions is an important competency of a project manager as there are many challenging situations during a project needing a lot of empathy according to Rattay (2013) so that a lot of additional benefits can be obtained from these situations. For Thomas and Mengel (2008), establishing commitment and providing orientation to an unknown or uncertain future requires the development of emotional capabilities by project managers. Awareness about the meaning of emotions for project communications is a further key factor for an emotional intelligent project manager (Gareis, 2006). In their article, Barczak, Lassk, and Mulki (2010) describe also a positive effect on communications between team members because of team and individual EQ. Furthermore, an important difference between a team with high and a team with low EQ is the higher performance of the first team right at the beginning of common work while the performance of both teams then will match again over time (Jordan, Ashkanasy, Härtel, & Hooper, 2002). Applied to international distributed teams, empathy is also of central importance as virtual team leaders, who had high empathy with regard to their team members, were found to be highly effective (Kayworth & Leidner, 2002).

Culture

In project teams, people from different business units or companies have to work together, who are not only different regarding their technical skills, but also related to their culture (Wastian et al., 2012). Especially, when it comes to international projects, Hößler and Sponfeldner (2012) mention that international cooperation always is connected to intercultural cooperation. So, intercultural competence has to be developed, whereby communication in particular plays also an important role because culture is expressed in communication (Nagel, 2012). Furthermore, the people's culture and perception have a great influence (up to 88%) on their understanding, which underlines the significance of cultural awareness (Fadil, 2013). Thereby, on the one hand, interculturality can lead easily to mistrust and rejection, but on the other hand it will offer new or unexpected approaches to solutions if it is handled appropriately (Majer & Stabauer, 2010). As an example, project leaders have to be aware of the importance of personal relationship-building for many cultures in European, Asian and Latin America countries before starting to work collaboratively with those people (Goleman, Boyatzis, & McKee, 2013). In conclusion, especially for an international project leader, Cultural Intelligence (CQ) is very essential. Thereby, CQ "focuses on understanding the shared patterns of groups that shape the way individuals value and meet their needs" Baker, 2012a, p. 25). CQ consists of three dimensions named as cognitive (head), emotional or motivational (heart), and physical (body), whereby all those dimensions are related to each other

and are therefore all relevant for improvement (Earley & Mosakowski, 2004). Based upon the conclusion of their case study about a Multi-cultural virtual project team (MVPT), He and Thatchenkery (2011) propose the promotion of establishing a mutual understanding culture by creative activities for virtual team building. Finally, Beranek et al. (2005) highlight the addressing and monitoring of doubts and concerns resulting of differences in group norms and culture between virtual project team members as an important task for the project leader throughout all project phases.

Social Software

Based upon the theory of social networks, Social Software systems support the collaboration and communication of teams in form of information exchange between users (Ahlemann et al., 2008). These systems link people and encourage collaboration among them (Schönefeld, 2009). Social Software is linked to Web 2.0 technologies, whereby Web 2.0 has a big influence especially on the communication, knowledge transfer and processes within and between enterprises (Koch & A. Richter, 2009). Thereby, using Social Software in the context of companies in order to support goal accomplishment is known as Enterprise 2.0 (McAfee, 2009). Moreover, Social Software provides opportunities to cover the natural needs of people (for example communication, stay in contact and interact with other people, self-presentation, etc.), which is a key element because the user is at the center of attention generating the content of those applications (Koch & A. Richter, 2009). Finally, Social Software particularly has great potential to improve collaboration and communication in virtual teams, to combat information overloading (flood of emails), to support networking among stakeholders, and to improve access to knowledge and information (Bächle, 2013). Ahlemann et al. (2008) differentiate four cooperation dimensions while analyzing potentials of Social Software for project management: (1) project result, (2) project planning and controlling, (3) project stakeholders, and (4) multi-project environment. So, already in 2008, Ahlemann et al. concluded high potentials of Social Software for coordination mechanisms in projects. Unfortunately, distributed collaboration and knowledge management are still supported in many cases in form of telephone conferences, endless emails, and less structured shared project directories or team rooms (Koch & A. Richter, 2009).

Social Bookmarks

Singer, Strohmaier, and Helic (2012) describe the core functionality of Social Bookmarking systems as the management of different types of resources (mostly web content) while using tags for these resources. Thereby, the bookmarks are stored centrally and can be accessed by all relevant users (Schönefeld, 2009). Additionally, the isolation of users is reduced by Social Bookmarking systems as they normally show, which tags have been assigned by whom or show a list of tagged links of a user (Koch & A. Richter, 2009). Finally, most systems support RSS feeds meaning that a certain user is informed actively if new content was tagged with reference to a specific tag or person. Such systems can be used in particular to share a common basis of resources for the whole organization or for specific project groups (Schönefeld, 2009).

Mashups

Hoyer (2012) notes that everyone surfing in the web has often been in contact with Mashup solutions without knowing it explicitly as Mashups are applications, which can be build up quickly also by non-IT people through combining existing resources. These applications integrate existing services into a new application and use therefore a principle known from software development called re-usability (Schönefeld, 2009).

Crowdsourcing

According to Koch and A. Richter (2009), Crowdsourcing is a concept to integrate people from outside the company into collaborative and creative processes of the offering company. Via Crowdsourcing, customers, competitors, and partners get targeted access to different areas of the respective company while especially the outsourcing of repetitive tasks and market research has great potential (Walter, 2012).

Social Forecasting

Social Forecasting is a method for forecasting purposes (for example regarding market chances, sales volume, probability of risk, etc.), which is done by many participants instead of few experts to collect information, and includes an incentive mechanism for participants to contribute as accurately as possible (Ivanov, 2012).

Weblogs

Weblogs improve the networking and collaboration of employees, the exchange of knowledge between people, and also support project management (Robes, 2012). Koch and A. Richter (2009) also emphasize the usage of Weblogs for project management to replace emails and to change the philosophy from push to pull communication within projects. In addition, they see potential of Blogs for the knowledge consolidation and exchange in virtual teams. Schönefeld (2009) emphasizes the combination of Weblogs and Wikis in particular, where the Wiki contains the knowledge and the respective Blog documents the progress and the current events or helps to coordinate mutual actions. A further essential issue is mentioned by Yu, Lu, and Liu (2010) describing that users can profit from easy accessible knowledge stored in Weblogs as they save time for finding solutions to their problems. Finally, related to projects based on Enterprise 2.0 platforms, Weblogs are proved to be suitable for communications in teams in general and for project marketing (Nedbal, Auinger, & Hochmeier, 2013).

Microblogs

In companies, Microblogs are useful for every case, where people work together (communication, information and networking) to accomplish a common goal (Schachner & Tochtermann, 2012). More specific, Microblogs are helpful for distributing information to all members of an organizational or a project team and enable the users to follow documents, or whole projects or teams (Schachner & Tochtermann, 2012). In their research paper, D. Richter, Richter, Hamann, Riemer, and Vehring (2013) describe cases, where for instance Microblogging was used in a research project serving as a platform for all communication within the project or to facilitate communication (sharing ideas and information) between projects and organizational teams in a project-based company.

Wikis

Koch and A. Richter (2009) propose the usage of Wikis, among others, for project management (for example time tables, project descriptions, etc.) and documentation of knowledge (for example handbooks, training material, etc.). According to Röchert-Voigt and Gronau (2012), Wikis can be used in project teams or work groups to support project-oriented collaboration, coordination, and communication. By taking care of project development, project management, and information sharing being the needs of people, Wikis also support active learning (Kai Wah Chu, Siu, Liang, Capio, & Wu, 2013). In his book, Mader (2008) compares a Wiki to three other popular tools (shared drives, intranet, and email) and concludes that a Wiki makes a lot of sense for specific tasks, but should not replace the other tools at all.

Social Networks

Vatter and Tochtermann (2012) mention the support of customers, market research, human resources, referral marketing, and open innovation as application areas for Social Networks. More in detail, Social Networks in form of the user crowd are very valuable to answer single questions, to generate and evolve new ideas, to solve special problems, and to get connected to experts of a specific field (Riemer, Scifleet, & Reddig, 2012). Finally, project management based upon Social Networks in form of a social project collaboration platform can be mentioned as a further interesting field of application as described in Li, Chen, Zhang, and Fu (2012).

Instant Messaging

According to Koch and A. Richter (2009), the success factors of Instant Messaging are time savings due to informality compared to emails (salutation and adoption), faster reaction than answering emails, and the perception that instant messaging is not that disturbing as telephone calls do. Remain connected to other people, scheduling and coordination, clarifications and quick questions, and the organization of spontaneous social meetings all are informal communication tasks being supported by Instant Messaging (Nardi, Whittaker, & Bradner, 2000). As an example, more and more virtual team leaders use Instant Messaging during virtual team meetings to engage team members, who are not contributing actively to the content of the meeting (Malhotra et al., 2007). Finally, Munkvold and Zigurs (2007) report also limitations of using Instant Messaging when working in different time zones or when communication content cannot be saved.

3. Development of the Model

This chapter is based upon the theoretical prepared knowledge of the previous chapter. The three knowledge pillars Stakeholder, Communication, and Social Software are used and integrated to develop a model for an optimized handling and improved transparency of virtual, international projects.

Adapting the Elements of Social Software

For the purpose of this article, the concepts of Mashups, Crowdsourcing, and Social Forecasting are not appropriate. Mashups, Crowdsourcing, and Social Forecasting are primary no media for an optimized handling and an improved transparency of projects, and concentrate more on fulfilling other goals. Therefore, they will not be used further in this work. All other described elements of Social Software have interesting features suitable for the objective of this work. Thereby, the boundaries are fluid between Social Networks, Microblogs, and Instant Messaging as Social Networks often integrate both others. To make it more clear, the focus of Social Networks will be on supporting contact management and providing professional information about a person (profile) in the following.

Communicative Capabilities and Elements of Social Software

Social Bookmarking systems could be applied sensefully to the dimensions Knowledge, Collaboration, and Identity. As the dimensions Knowledge and Identity can be supported better by other elements of Social Software, the focus for Social Bookmarks will be on supporting Collaboration in form of sharing different types of resources with other team members.

A usage of Weblogs would make sense in principle for different dimensions (Motivation, Shared Mental Models, Vision, Knowledge, Collaboration, and Identity). But Weblogs are more suited to assist Shared Mental Models (as they promote a common understanding between members before news are published afterwards in agreement), Knowledge (share new information with members or discuss/comment information), and Collaboration (resulting from the functionality Weblogs provide like for instance subscribing, tagging, etc.).

The dimensions Motivation, Awareness, Knowledge, Collaboration, and Identity could be all supported by Microblogs. But Microblogs can best support the dimensions of Awareness through providing current status information and Knowledge by sharing information with other members.

Wikis could help regarding the dimensions SMM's, Vision, Knowledge, Collaboration, and Identity. As several people work together within a project area in a Wiki, it promotes the development of SMM's. Furthermore, this project area is useful for placing an engaging vision for the project and to support professional knowledge management. Finally, the project area can be enhanced by content helping to establish an identity for the team members and supports in general the collaboration with its different kind of functions (for example versioning, authorization, etc.).

Social Networks would be able to assist the dimensions Motivation, Power, Trust, Identity, and Awareness, but they are best suited for taking care of powerful stakeholders (Power), to create trust based upon contact management, and to support identity due to profile information (working for which project).

Instant Messaging supports awareness directly by providing different kind of status information. Furthermore, with its functionality for synchronous communication in real time, it can be used for motivating people, to address conflicts sensitively, to support different coaching activities, and to assist in showing empathy for a team member. Finally, Instant Messaging as a rather informal communication media can be useful to overcome cultural differences and to take a first step for promoting cultural understanding.

Transparency and Elements of Social Software

The last section concentrated on connecting the project leaders' communicative competencies with respective elements of Social Software. There, the focus was on optimizing the handling of a single virtual, international project. The core concept of this section is not to optimize one single project, but to have a look at how the transparency of several projects (for example within a department or a business division of a company) can be improved. Thereby, from the list of elements of Social Software being in the scope of this work, the following application classes are suitable to use with reference to project transparency: (1) Weblogs, (2) Wiki, (3) Microblogs, and (4) Social Network.

Social Bookmarking and Instant Messaging being not a part of this list could also be used for increasing projects' transparency, but compared to the remaining ones, their impact should be rather small. They can be better used for each single project. In contrast to the excluded elements, the four items of the list seem to have great potential for improving transparency. People interested in other virtual projects could read the Weblogs, they could visit the project areas provided by a Wiki, they could subscribe for contributions made in Microblogs, and they could look at project organizations published in a Social Network for their information about who works in which important project.

Creation of the Model

Based originally on the knowledge theoretically described in chapter two, first the prepared communicative capabilities have been linked to the respective elements of Social Software and second, suitable elements of Social Software have been selected, which could be able to support transparency among projects. Building on that basis, a model for an optimized handling and improved transparency of virtual, international projects is introduced. This model is visualized in Figure 2. It has two layers:

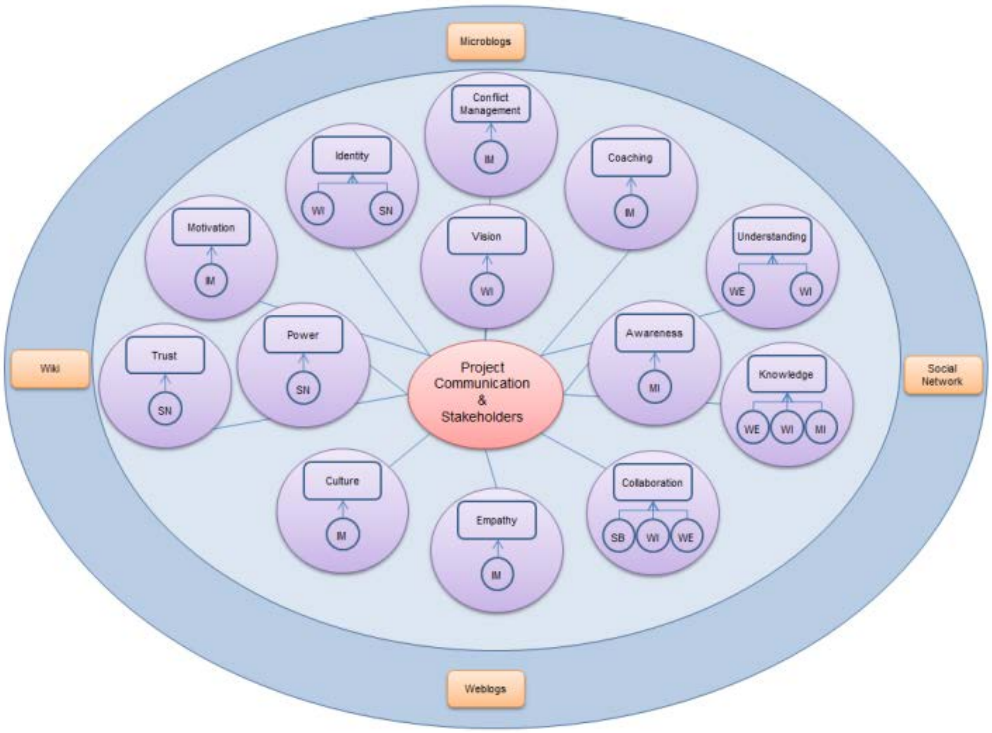
- Inner layer
- Outer layer

In general, the inner layer is representing the view on one single project while the outer layer is representing the view on several projects.

In the middle of the inner layer, an ellipse named as "Project Communication & Stakeholders" can be seen. This is the central component of this model, on which all other elements build upon. Projects cannot be done without humans and in almost all cases; there are lots of stakeholders involved in a project. So, they have to work together to accomplish projects and therefore, also communication is of central importance. The 13 communicative capabilities shown as circles are based on that central component as they cannot work without this central issue. For Coaching serving as an example, the project leader needs to take care of the specific human to be coached having individual needs and expectations combined with the humans' project role. In addition, the project leader needs to understand the communication principles to transfer messages efficiently during a coaching session. Each circle is representing one communicative competency, whereby the communicative competency is displayed as a rectangle. Furthermore, the respective supportive elements (IM = Instant Messaging, SN = Social Network, WI = Wiki, WE = Weblog, MI = Microblog, and SB = Social Bookmarks) of Social Software are visualized as small circles. For instance, Awareness being one of the communicative competencies can be supported by a Microblog. In summary, the inner layer of the model shows the capabilities necessary to optimize the handling of single virtual, international projects.

The outer layer represents the view across several projects and contains four elements of Social Software depicted as rectangles. While these elements are used in the inner layer to support the communicative competencies with the aim to optimize single project handling, they are used in the outer layer to improve transparency among several projects.

Figure 2:
The developed two-layer model for an optimized handling and improved transparency of virtual, international projects



4. Hypotheses & Methodology

In the first chapters, the scope of this work and the respective theory have been described to establish the fundamental basis necessary at all for creating a new approach for an optimized handling and improved transparency of virtual, international projects. Then, in the previous chapter, a model representing this approach has been developed based on the theoretical prepared knowledge. Next, this model has to be evaluated. Therefore, the following two hypotheses have been derived to be tested in the further course of this paper:

- H1: The overall project handling of virtual, international projects is correlated with specific communicative capabilities of the project leader supported by selected elements of Social Software.
- H2: The overall project transparency of virtual, international projects is correlated with the usage of specific elements of Social Software.

Target Group

In order to examine the given hypotheses, the target group has been defined to focus on people working in virtual projects. Thereby, experts working in virtual projects have been chosen from six different companies located in three countries (France, Lichtenstein, and Germany). In the following, some more details about those six companies and the respective experts are given:

- Experts working in the area of IT, process consulting, logistics warehouse and transport consulting, and systems integration of a logistics service provider with 24.988 employees
- Enterprise account managers employed at a company developing software solutions with 7.072 employees
- Experts working in the area of internet software solutions of a company in the IT service sector with 36 employees
- Project Managers working for a multi-industry group with 160.745 employees

- Experts for IT administration, processes and software development working for an electronics manufacturer with 9.800 employees
- IT network architects working for a car manufacturer with 116.324 employees

Data Collection

As for evaluating the hypotheses relationships among different variables have to be analyzed, a quantitative research approach has been chosen instead of using a qualitative research approach or a combination of these two approaches. Therefore, a questionnaire was created to collect data from the defined target group. This questionnaire has been distributed to the target group by email, whereby the questionnaire could be either filled in electronically or be printed out. The questionnaire was designed in German language for German speaking experts and in English language for international participants. The duration for completing and submitting the survey was one week.

Questionnaire in Detail

The questionnaire was kept simple providing 41 questions on three pages divided into two parts:

- Statements related to distributed, international projects
- General questions (demography)

The full questionnaire can be seen in the appendix.

Based on the model developed in the last chapter (Figure 2), the statements of the questionnaire have been defined accordingly to make the model verifiable and measurable regarding the given hypotheses. For each communicative capability or dimension of the inner layer, one statement was designed to evaluate the dimension itself. In addition, for each dimension the respective elements of Social Software were also translated into specific statements completing the respective dimension. Looking at the outer layer of the model, the four elements of Social Software were summarized to one dimension named as “Transparency”, whereby for each element of this layer one statement was created. For both the inner and the outer layer, one statement dealing with the current overall satisfaction was developed. In case of the inner layer, this statement is about the overall satisfaction with the current project handling, while in case of the outer layer the statement is about the satisfaction with the current transparency of other projects. With these two overall statements it is possible to set each single statement in relation to the respective overall statement.

Finally, each statement is measured on a five point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Thereby, the statements from 1 to 33 are representing the first part (inner layer) of the model, while the statements from 34 to 38 are representing the second part (outer layer). Later on, the data gathered for the first part will be used for evaluating the first hypothesis H1. Furthermore, the data collected for the second part will be used for testing the second hypothesis H2. The second part of the questionnaire consists of three general questions about the gender, the age, and the practical experience in profession. For these questions, the participants only had to mark the right category.

5. Empirical Results

The questionnaire has been distributed to 85 experts from six different companies located in three countries (France, Lichtenstein, and Germany) while 58 of these experts had returned a completed questionnaire. This is a respondent rate of 68.2%. From these 58 respondents, nine are female and 49 are male. Regarding the age of the participants it can be said that most of them (26) are older than 40 years. 19 people are between 30 - 40 years old. Lowest is the number of participants being younger than 30 years. With respect to the practical experience in profession of the participants, ten people have less than five years of practical experience. Eleven people have experience between five and ten years. Experience between eleven and 15 years is given also for eleven participants. With 26, the number of professionals having most practical experience (more than 15 years) is the highest one for this question.

Table 1:
Overview about the gathered data (mean value, standard deviation) for the elements of the developed model, divided into the first part (inner layer, statements 1 to 33) and the second part (outer layer, statements 34 to 38).

	n	Mean	SD
1. Motivation	58	3.43	.993
2. Motivation & Instant Messaging	58	3.34	1.250
3. Trust	58	3.29	1.009
4. Trust & Social Network	58	2.90	1.266
5. Power	57	3.16	1.162
6. Power & Social Network	58	2.26	1.264
7. Identity	58	2.78	1.093
8. Identity & Wiki	58	3.43	1.011
9. Identity & Social Network	58	3.17	1.126
10. Conflict Management	58	3.38	.952
11. Conflict Management & Instant Messaging	58	2.00	1.155
12. Coaching	58	2.69	1.111
13. Coaching & Instant Messaging	58	2.72	1.073
14. Vision	56	3.43	1.126
15. Vision & Wiki	58	3.38	1.254
16. Understanding	58	3.97	1.008
17. Understanding & Weblog	58	3.24	1.014
18. Understanding & Wiki	57	3.68	.967
19. Knowledge	58	3.26	1.148
20. Knowledge & Weblog	58	3.33	.998
21. Knowledge & Wiki	56	3.68	1.130
22. Knowledge & Microblog	58	3.24	1.081
23. Awareness	58	3.53	1.127
24. Awareness & Microblog	58	3.21	1.104
25. Collaboration	58	3.81	1.017
26. Collaboration & Social Bookmarks	57	3.04	.981
27. Collaboration & Wiki	58	3.40	.954
28. Collaboration & Weblogs	57	3.18	.928
29. Empathy	58	3.22	1.044
30. Empathy & Instant Messaging	58	2.53	1.314
31. Culture	58	3.55	.976
32. Culture & Instant Messaging	58	2.62	1.309
33. Overall satisfaction with current project handling	58	3.17	.994
34. Other projects & Weblogs	58	2.86	1.034
35. Other projects & Wiki	58	3.10	.949
36. Other projects & Microblogs	58	2.60	1.091
37. Other projects & Social Network	58	3.14	1.067
38. Overall satisfaction with current project transparency	58	2.74	.947

Table 2:
Correlations between the elements of the developed model and the overall satisfaction with current project handling (inner layer, statements 1 to 33).

	Overall satisfaction with current project handling
1. Motivation	.617**
2. Motivation & Instant Messaging	.064
3. Trust	.474**
4. Trust & Social Network	.154
5. Power	.194
6. Power & Social Network	.215
7. Identity	.489**
8. Identity & Wiki	.082
9. Identity & Social Network	.114
10. Conflict Management	.338*
11. Conflict Management & Instant Messaging	.015
12. Coaching	.494**
13. Coaching & Instant Messaging	.259*
14. Vision	.500**
15. Vision & Wiki	.045
16. Understanding	.461**
17. Understanding & Weblog	.097
18. Understanding & Wiki	.053
19. Knowledge	.468**
20. Knowledge & Weblog	-.093
21. Knowledge & Wiki	-.018
22. Knowledge & Microblog	.075
23. Awareness	.496**
24. Awareness & Microblog	.015
25. Collaboration	.432**
26. Collaboration & Social Bookmarks	.085
27. Collaboration & Wiki	.130
28. Collaboration & Weblogs	.091
29. Empathy	.470**
30. Empathy & Instant Messaging	.130
31. Culture	.370**
32. Culture & Instant Messaging	.146
33. Overall satisfaction with current project handling	-

*p < .05 **p < .01

Table 3:
Correlations between the elements of the developed model and the overall satisfaction with current project transparency (outer layer, statements 34 to 38).

	Overall satisfaction with current project transparency
34. Other projects & Weblogs	-.180
35. Other projects & Wiki	-.048
36. Other projects & Microblogs	-.118
37. Other projects & Social Network	-.138
38. Overall satisfaction with current project transparency	-

*p < .05 **p < .01

In chapter four, two hypotheses H1 and H2 have been declared. Then, research data was gathered by a survey and was analyzed in detail in order to evaluate the correlations defined in these hypotheses. Now, the Null-Hypotheses are derived so that they can be checked in the following:

- $H1_0$: Any correlation between the overall project handling of virtual, international projects and specific communicative capabilities of the project leader supported by selected elements of Social Software is due to chance alone.
- $H2_0$: Any correlation between the overall project transparency of virtual, international projects and the usage of specific elements of Social Software is due to chance alone.

First Hypothesis

Table 1 shows that in general all statements or dimensions from 1 to 33 have potential for improvement as they are all below a value of four. When analyzing them more in detail, in particular the statements 11 (Conflict Mangement & Instant Messaging), 6 (Power & Social Network), 30 (Empathy & Instant Messaging), 32 (Culture & Instant Messaging), 12 (Coaching), 13 (Coaching & Instant Messaging), and 7 (Identity) offer big room for optimization with their mean values lower then three. In contrast, less potential for improvement is given for the statements 16 (Understanding) and 25 (Collaboration) as those statements have the highest mean values among all those elements. The high standard deviation of all statements indicates strong differences between the survey participants.

With a mean value of 3.17, the current virtual, international project handling (overall statement 33) moves into the focus of improvement as well.

Table 2 summarizes the statements or dimensions, where a statistically relevant correlation to the overall satisfaction with the current project handling was calculated. In total, 13 statements were found to have such a statistically significant relation. These statements are representing twelve of 13 dimensions of the model introduced in chapter five. As a consequence, it can be derived that for these statements or dimensions the defined Null-Hypothesis $H1_0$ can be rejected. This means that for these statements or dimensions there is in fact a relationship with the overall satisfaction of the current project handling. So for instance, putting more effort into the development of coaching capabilities will lead to a better handling of virtual projects. In the following, the listed statements are classified into three groups with reference to their Pearson correlation coefficient:

- Weak relation (< .300)
- Good relation (> .300)
- Strong relation (> .500)

A weak relation could only be observed for the statement 13 (Coaching & Instant Messaging). So there is in fact a statistically relevant relation, but this is not as strong as for other statements. A good relation could be detected for most of the statements, which are: Statement 3 (Trust), 7 (Identity), 10 (Conflict Management), 12 (Coaching), 14 (Vision), 16 (Understanding), 19 (Knowledge), 23 (Awareness), 25 (Collaboration), 29 (Empathy), and 31 (Culture).

Thereby, 7 (Identity), 12 (Coaching), 14 (Vision), and 23 (Awareness) are close to be called strong relations. Though there is a good relation for 10 (Conflict Management) and 31 (Culture), these relationships are not as good as the other ones within that group. For one statement, there was found a really strong relation to the overall satisfaction with the current project handling. It is statement 1 dealing with Motivation. Looking at the remaining 19 statements, no statistically significant correlations could be calculated. 18 of those 19 statements are dealing with elements of Social Software in order to support the respective dimension. But one of these remaining statements is Power itself (statement 5) being the only dimension having no relevant relation.

Second Hypothesis

With a mean value lower than four, all four statements in general are in the focus for development while especially the statements 36 (Other projects & Microblogs) and 34 (Other projects & Weblogs) are low developed with a mean value below three. This is depicted in table 1. Similar to the section above, there are strong differences between the survey participants as the standard deviation is relatively high.

Also, the participants are not satisfied with the current project transparency of several projects, which is indicated by a low mean value of 2.74 for statement 38.

For the dimension of Transparency and the respective four statements as shown in table 3, no statistically significant correlation to the overall satisfaction with the current project transparency of other projects could be found. Therefore, the defined Null-Hypothesis H20 cannot be rejected. This means that there in fact exists no relationship between these statements and the overall satisfaction with the current project transparency of other projects. As an example according to this result, building up a Social Network will not lead to a higher transparency of virtual projects.

The Revised Model

Based upon the last two sections, Figure 3 shows the revised model, which was originally introduced in chapter five. It shows again the 13 dimensions related to virtual project handling, which were examined. They are depicted in the inner layer (view on one single virtual project). In contrast to the original created model, the dimension of Power has no relevance anymore as proven above. Except of Instant Messaging (IM) for the dimension of Coaching, it has been further analyzed that for all other dimensions the respective elements of Social Software cannot give support. The relevant dimensions or elements are shown in green color while the other elements are displayed with dotted lines signalizing that they can be neglected. In addition, it was shown that a Wiki (WI), Weblogs (WE), Microblogs (MI), and a Social Network (SN) as elements of Social Software are not able to contribute to the transparency of other virtual projects. This is visualized in the outer layer (view across several virtual projects). Here, the elements are also displayed with dotted lines to emphasize that they can be disregarded.

To sum up, project leaders of virtual, international projects need to take care of improving their dimensions Motivation, Trust, Identity, Conflict Management, Coaching, Vision, Understanding, Knowledge, Awareness, Collaboration, Empathy, and Culture in order to increase the efficiency of virtual project handling. Elements of Social Software can be mostly ignored by project leaders as they currently do not have a benefit for the handling of projects. Finally, in order to improve the project transparency over several virtual projects, project leaders have to use other tools (for example tools for project portfolio management) instead of Social Software (Wikis, Weblogs, Microblogs, and a Social Network) at present.

6. Conclusions

For the article in hand, a quantitative approach in form of a survey has been chosen to collect data. While designing this survey, the focus was on consistency and simplicity to make it as easy as possible for the participants to complete their given surveys. Over all questions, the participants only need to mark their answer. Furthermore, the formulated statements were aimed to be short and easy to understand for the people. In total, it should not take longer than ten minutes to fill

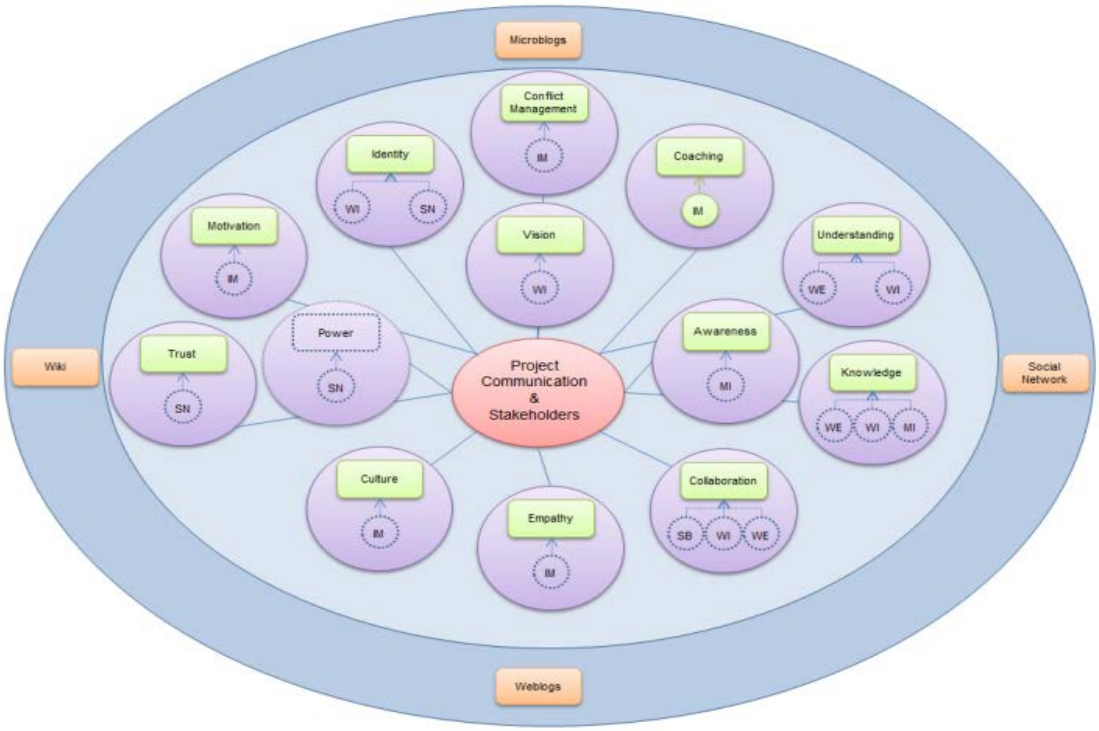
in and submit the questionnaire despite of gathering important data with reference to the defined dimensions of virtual, international projects. With 58 completed surveys, the precondition of more than 30 responses necessary for a meaningful correlation analysis has been fulfilled. Consequently, the collected quantitative data is

statistically reliable. In this work, only the relationships between the dimensions and the overall satisfaction were in focus. But of course, the dimensions are also related to each other so that they influence themselves mutually. That issue was not considered here.

Recommendation for Future Research

The results of the empirical part visualized in the final model are clear and comprehensible as the respective dimensions or statements have been shown to be statistically significant. On the other hand, there are some dimensions or statements, where the author of this work thought that they also would have an influence on the overall handling and transparency of virtual, international projects. But for these statements or dimensions, no meaningful correlations could be observed. This especially had a particular impact on elements of Social Software supporting the mentioned defined dimensions for virtual projects. Here, the researcher was surprised that almost no element of Social Software plays a significant role regarding the scope of this work as he suggested that Social Software would be very useful for optimizing and improving virtual project handling and transparency.

Figure 3:
The revised two-layer model: In green, the significant dimensions/elements are depicted



Additionally, there might be further dimensions, which have not been covered in this work, but are also correlated to the overall handling and transparency of distributed projects. Another limitation could be the different interpretation of the statements or questions of the survey by different people. As described above, the meaning of the statements or questions is decoded by each person individually based upon specific framework conditions (freedom to interpret the message as the person wants). Furthermore, it maybe was not sufficient to cover each dimension itself regarding virtual project handling and transparency with only one statement as each dimension has much complexity and therefore maybe needs to be covered by several statements. Finally, there is one more point of interest. Although the 58 returned surveys were completed by participants from six different companies, more than half or the responses came from people working for the same company. It could be that this may also have influenced the total results of this paper.

Therefore, it is recommended to conduct this survey in further companies. Of course, the survey carried out in this work still contained data from experts working in different companies located in different countries. But it would be interesting to see, whether statistically relevant correlations could be observed for elements of Social Software in particular, when this survey would

be extended related its usage to address more experts of more different companies, countries and cultures. This would increase diversity and would also lead to an increased sample size as the sample size in this work is rather small. Additionally, IT development never stands still and therefore, also Social Software will continue to evolve. Also, some firms maybe are currently not aware of the potential benefits Social Software could bring to their international, virtual projects. A further topic of interest for future research would be the various roles of stakeholders. The survey developed in the context of this article differentiated between two roles in principle: Project leader and project member. Thereby, the role "project member" summarized all other roles of people being involved in a project as for example project sponsor or project team member. Here, it would be interesting to see, how the results would look like, when the existing survey would be further refined regarding the details so that the given dimensions could be evaluated according to different stakeholder roles.

Finally, it could make sense to differ between different types of projects for future research. For instance, projects can be classified into organization, development or investment projects (Kolb, 2012). Maybe, there would come up interesting results regarding the defined dimensions and elements of Social Software according to the specific project type.

7. About the Author

Benjamin Thienel, MBA, has started to work as an IT specialist for a big logistics service provider after completing his first study of computer science in 2008. Here, he gained first experience with projects in virtual and international context. With beginning of 2015, he graduated part-time with a Master of Business Administration focusing on International Business Management, Leadership and International Project Management at the University of Applied Sciences in Kempten. Since 2015, he works as a team leader for the mentioned company, where he is responsible for realizing national and international EDI projects in a virtual context.

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