Social relationships in IT project teams: its role, complexity and the management thereof

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Abstract:
Compared to other projects, information technology (IT) projects, characterized by emergency and uncertainty, are unique. To implement an IT project successfully, many aspects need to be monitored and carefully controlled and managed. One such aspect is social relationships. All IT professionals are exposed to, and in many cases involved, in the phenomenon of social relationships. These relationships are used by software project team members for personal as well as professional purposes. In most cases the impact of these relationships on the success or failure of any given IT project is ignored by IT management. Little attention is given thereto in the literature and this paper attempts to make a contribution in terms of giving a broad perspective of the complexity, the impact, as well as the management of such relationships. This paper demonstrates that these relationships play a significant role and should be managed in such a way that the team members and the project as a whole can reap the benefits thereof. A conceptual framework is proposed for the management of these relationships.

1. Introduction and problem description

The information technology (IT) project management literature is extensive with regard to success factors as well as the causes of failure; however, little focus is placed on the role or importance of social relationships and networks within IT projects.

Liebowitz [11] feels that the greatest threat to the success of any IT project is the failure to communicate. This statement in particular draws the attention to the problem area of the research. Although one wants to see a project environment where a culture of sound communications is promoted, it is difficult for any project manager to 'control' any influence this might have on team members and as such on the progress of a given project. Sauer [14] believes that a major part of the problem of IT project failure is the lack of recognition that information systems development is largely a social and political process. This view is also shared by Standing [15]. Considerable effort has already been spent on the process of managing IT projects and has produced multiple methodologies and methods for project management and the IT software development life cycle [16].

Ashworth et al. [2] state for example that:

> *Social network theories suggest that the types and degrees of an individual's relationships in social and communication networks are key impactors of group performance, while resource dependency theory suggests that non-social factors, such as knowledge and skills, figure at least as prominently as social dimensions in determining such performance.*

Social factors are increasingly being considered as important for achieving more consistent and sustainable success in corporate environments. Organizations are spending increasing amounts on social responsibilities outside their operating environments, as their customers are taking cognizance of these issues and are demanding these efforts. Inside the organizations, similar efforts are being made to heed the social factors, especially from a human resources point of view.

In organizational theory, managers are viewed as contributing over and above the skills they have acquired through experience and education, the value of their social networks. These values or assets refer to the social capital of the manager. Scholars have highlighted the ability of these social networks that can be used to the individual's or organization's advantage [7],[2]. With this in mind, the question is how social relationships and networks within IT project teams are viewed, instead of focusing only on that of the project managers. The social capital of the individuals participating in the IT project teams is an influencing factor on the social networks that are active within the project teams.

The first consideration is that of determining the strength of these social networks. Network strength can be defined as the frequency of communication, while the degree of the network is defined as the number of direct links with other network members [8].

Social networks have a key function in the social information processing within an organization, especially relating to connecting social influence, knowledge and the organizational culture to the actual projects at hand. This influence is depicted in Fig. 1.

Fig. 1 illustrates that positive social influence is supportive of IT adoption, whereas negative social information processing contains information opposing system adoption. The +/- valences of the arrows in Fig. 1 indicate the direction of interaction between network strength and social information processing (e.g. positive social information processing increases network strength whereas negative social information processing decreases network strength). The strength and density of the communication network alters the potential of social influence to affect adoption. Stronger network connections increase the likelihood that social influence will be received from different sources, and also increase the frequency with which such transfers occur [8].
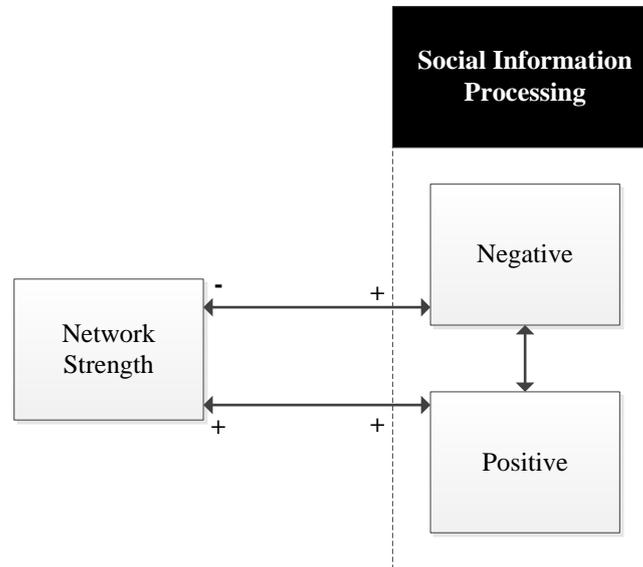
Fig. 1. Interaction of network strength and social information processing [8]

In summary, therefore, the problem under investigation in this research was to determine the role and nature of social relationships and networks within and between the IT project teams, as well as their influence in the success or failure of such projects.

In the rest of the paper a description is given of how the research has been done and how data has been gathered. The paper gives a theoretical overview of social relationships and networks. After this, data is presented and discussed to illustrate how relationships work in practice and how they impact or influence project teams and as such project outcomes.

2. Theoretical background on social relationships and networks

2.1 The establishment and maintenance of sound relationships

Relationships between end users and team members of IT projects are described by Leonard [10] as intriguing and complex. According to Leonard a large number of elements (amongst others: support; cooperation; knowledge; and commitment) are involved during the establishment and maintenance of sound relationships. Furthermore, he argues that if any of these elements are disturbed, the whole relationship is disturbed. In other words, these elements form a holistic 'unit'. Each of these elements therefore plays a specific social role in a relationship, which impacts on the soundness of a relationship and as such on the cooperation between team members.

In order to overcome the problem of poor relationships between IT professionals and end users, for example, it is argued that a 'human-behavior' strategy of some kind should be followed. This strategy should involve amongst other things focusing on those social issues that will enhance trust, commitment, cooperation, etc. Reich & Benbasit [13], referred to by Leonard [10]) point out that there are two dimensions to strategy creation: the intellectual dimension and the social dimension. With regard to this research, the social dimension was the focus.

Sound social relationships could be regarded as an important ingredient for any working environment. Not only between employees in general, but also for the purpose of organizational learning and support.

2.2 The STC framework

Collinson [4] defines the Socio-Technical-Constituencies (STC) framework (see Fig. 2) as a tool to map out and identify the roles of the various sources of knowledge, expertise and other factors influencing the innovation process. In particular social, organizational, technical and economic factors are highlighted. Although the STC of Collinson [4] is based on the innovation process, this model can be extended to IT projects that are in essence projects concerned with innovation. The STC assists in identifying the alliances, alignments and social interactions that can be critical to the success or failure of the IT project. Collinson [4] defines socio-technical constituencies as:

> *Dynamic ensembles of technical constituents (tools, machines, etc.) and social constituents (people and their values, interest groups, etc.), which interact and shape each other in the course of the creation, production and diffusion (including implementation) of specific technologies.*

Applying this idea to relationships and social networks allows one to emphasize the concept of interrelation and interaction between the individual team members participating in the IT project. This interaction occurs between the different sets of social constituents of the team members involved in the IT project, impacting across a variety of networks, and thus from the basis of the socio-technical constituencies.

In IT projects, the use of the STC approach enables the identification of the social, economic and technical networks that form the basis for achieving a successful outcome. Thus the elements that can constrain or facilitate constructive social networks can be identified and addressed. The STC model thus enforces the idea that social relationships and networks are the key to the successful implementation of IT projects.

Trust

Although all the elements mentioned by Leonard [10] are important for the establishment and maintenance of sound relationships, it is noteworthy that the element of trust could be regarded in most cases as the basic ingredient for sound relationships, and therefore more theory is given in this regard.

Trust is an important component in social relationship building, but it remains a complex and ambiguous phenomenon ([9]). Kadefors defines trust as: 'Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another'. This definition implies that trust is not a behavior, but rather a psychological state. Furthermore, Kadefors explains that trust is not a prerequisite for cooperation, but the presence of trust improves and extends the level of cooperation.

Trust becomes important in IT projects due to the high level of cross- functional members that participate in IT projects and the associated fundamental need for cooperation. Required trust levels are directly affected by the situational circumstances and the team dynamics within IT projects. Finding the right balance of trust is important, as there are costs associated with trust [9]:

- Direct costs are associated with the building of trust;
- Potential costs of breaching trust;
- Costs resulting from inefficiencies due to excessive levels of trust.

Trust can be created by the following methods:

- Relational trust. Relational trust is created through repeated interaction between individuals. Trust is based on the personal experiences of individuals and their interpretation of events;
- Calculus-based trust. Calculus-based trust results when the trusting party believes that the trusted party will deliver on the promised actions, as this delivery is in the financial interests of the trusted party;
- Institution-based trust. Trust is created through institutions, such as legal systems, regulatory systems and societal systems. These systems are very much context-related and the levels of trust can thus differ, based on their context.
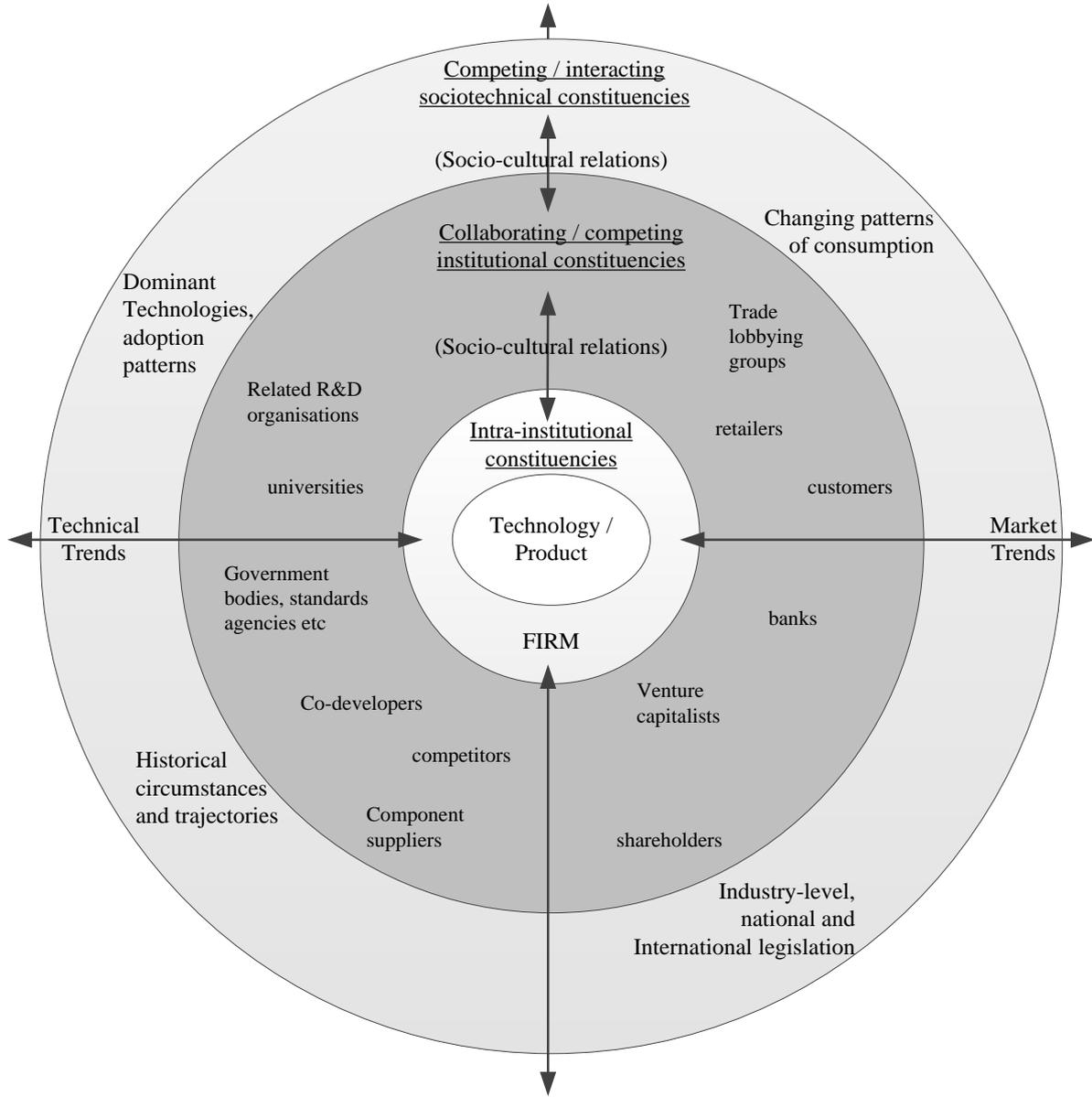
Fig. 2. Socio-Technical Constituencies framework [4]

Trust is thus a context-based psychological state that is affected by the participating individuals, as well as the associated circumstances. Kadefors [9] explains it in the following way: 'We trust a colleague or exchange partner in some situations but not in others, and decisions on whether or not to trust are continuously revised in the light of new information.'

Due to the need for cooperation in IT projects, relational trust is the prime driver of trust development in IT projects. Close cooperation, especially beneficial cooperation, is only created over time through interpersonal interactions.

This implies that social characteristics and relationships developed between individuals thus have a direct influence on the levels of trust that exist within an IT project environment.

In the next part of the paper the empirical research is presented (based on project charter and project closure documentation) to illustrate what social activities take place in a typical IT project environment.

3. Materials and methods

A large South African financial bank was chosen for the investigation. This investigation took place over a period of several months from the beginning of 2008. The motivation for using this bank was because of the large number of on-going projects that exist at any given point in time. This bank also undertakes a considerable number of IT projects on an annual basis.

Information was primarily obtained from project documentation of completed or abandoned projects within the IT departments of the corporate bank. A survey was created, based on the initial findings of the grounded theory research, and these findings were then sorted into categories.

Based on the information analyzed during the initial literature review and personal experience, the following question was formulated: Do the social relationships and networks within project teams and external to these teams influence the outcome of such projects?

During the grounded theory process the following secondary questions were identified and addressed:

- How are social networks used?
- Do separate and distinct social networks develop within project teams?
- Do pre-existing social relationships and networks between potential team members influence the dynamics of a new project team?
- What factors outside the project team have an influence on the social relationships and networks?

To answer the above mentioned questions, the empirical research process took the form of reading through a large number of relevant project documentation. At the same time data was arranged, categorized and analyzed. Answers to certain research questions emerged and a comparison with existing literature was done. In the following section a theoretical background is given, as well as how the empirical research process took place.

The survey utilized in the research is classified as a cross-sectional survey, as it involves approaching a sample of respondents only once. The sample is regarded as a cross-section of the population under study. The survey results were used to compare subgroups (such as project managers and developers) and evaluate relationships between variables.

The target population for the survey was limited to members (project managers, developers and other participants in IT projects) of two case studies. The survey was distributed to 100 possible candidates in the form of a self-administered internet questionnaire.

The Likert Scale was used to measure the participants' views on the categories identified during the initial data collection phase. The Likert Scale allows for interval scales and a full spectrum of statistical analysis.

A deductive interpretativistic approach was applied to analyze the results of the survey.

4. Empirical research

The data used for the initial Grounded Theory (GT) process was obtained from project documentation. These documents consisted primarily of project charter and closure documentation. The data was used to identify the concepts and categories during the data collection phase of GT. Further information relating to the concepts and categories were obtained using a survey distributed to participants from case studies. In the rest of this section the different case studies that were used are briefly described and an analysis of the data is presented.

4.1 Case Studies

Three case studies were used in this research project. The grounded theory process is based on the first two which come from different IT environments. The third case study is based on the work of Leonard [10]. In his research of how sound relationships should be built and maintained between different role players in the IT project environment, he made use of an interesting constructive thought experiment to base his argumentation on.

The first case study refers to the primary centralized approach and the second case study relates to a decentralized approach. The two environments where the first two case studies come from are briefly described in 4.1.1 and 4.1.2. The third case study in which a thought experiment is used, is described in 4.1.3.

4.1.1 IT Environment 1 (Case study 1)

In the first case a Technology Program Office was created by the bank to provide integrated end-to-end management services for the strategic project portfolio. The bank makes use of program management to control the myriad of projects executed concurrently within its environment. The project management methodology was based on the PMI PMBOK. All nine knowledge areas are implemented, but tailored to the bank's environment.

4.1.2 IT Environment 2 (Case study 2)

The second case focuses on the bank's Personal Loans Information Technology division, which is a full-fledged IT department that services the needs of the Personal Loans business division within the bank. The primary focus of the team is to provide and maintain information systems that cater for the specific needs of the Personal Loans mono-line. Their approach to project management was similar to that of case study 1.

4.1.3 Building of sound relationships - a thought experiment (Case study 3)

Based on the work of Leonard [10] the following thought experiment is used to illustrate the positive impact the building and maintenance of sound relationships can have on different role players in the project environment. The scenario he describes in terms of a thought experiment is as follows:

> An end user, Mr. Jones (an employee of the training department of the organization), is experiencing problems with designing a system for his department on the micro-computer in his office. Mr. Jones got the assignment from the manager of his department, Mr. Williams. The purpose of the system is to keep track of all employees' educational details, training courses attended and other abilities. This, Mr. Williams believes, will help him to manage more effectively the assignment of training courses his staff is to present to the employees of the organization during the year. This was one of his main responsibilities as training department manager. Furthermore, Mr. Williams believes that because of Mr. Jones's knowledge of the MS Access package on his office computer, this task could be done without the support of the IT department.

A week after Mr. Jones started with the development of the system he started to experience problems linking certain files in his relational database. Because of his poor knowledge of database technology, Mr. Jones realized that he will definitely need the support of an IT professional to help him overcome the specific problem. Mr. Jones made use of the HELP desk service to communicate his need to the IT department. After entering his details on the system he was given a reference number to use when doing any enquiries in this regard.

The next morning the steering committee evaluated all new service and support requests and saw Mr. Jones' request amongst them. Because of the details the specific end user gave, it was easy for the committee to realize that this service and support request is a "legitimate" one and that it can stay on the HELP desk system for the attention of any IT professional. The committee then updated the request with an official unique HELP desk service and support number which can be used by the requester for future reference.

The next morning an IT professional, Mr. Robertson, scans through the requests appearing on the HELP desk system and his eye catches the request of Mr. Jones. When Mr. Robertson saw the message on his screen it immediately grasped his attention because he loves working with database related system problems. He therefore immediately phoned Mr. Jones to arrange for a suitable time to visit him and help him with his problem. Mr. Jones first reacted by saying that maybe Mr. Robertson could quickly help him over the phone. Bearing in mind that it is the IT department's responsibility to establish sound relationships with its end users, Mr. Robertson responded by saying that apart from the fact that he sees it as his responsibility to go and visit Mr. Jones and to give him personal assistance, he is also very interested to see what Mr. Jones is doing. Mr. Robertson also made the point that maybe he would even see potential for a linkup of Mr. Jones's system to the mainframe system. Mr. Robertson knew that it is important that he should try and build the relationship on a sound basis from the start, so that if Mr. Jones should need more support on the system he is designing, he would not hesitate to contact him.

Mr. Jones had a meeting that morning. They therefore made the appointment for right after the meeting, which was for 14:00 that same day. Mr. Robertson arrived at Mr. Jones's office on time. During their first meeting it became clear to Mr. Robertson that Mr. Jones was clearly quite clued up with the package and it would not take him a long time to explain how to solve the problem. Mr. Robertson also realized that it was his responsibility, based on the general ethical code in the IT department, to book Mr. Jones on a course to enhance his database design skills and thereby make Mr. Jones even more independent of the IT department in the end user computing terrain. Mr. Jones was very pleased with the prospect of getting more training and this made him even more enthusiastic to make a success of the project. They had a very constructive discussion afterwards on a possible future application of information technology in the training department. After adjourning the meeting, Mr. Robertson invited Mr. Jones to contact him should he experience more problems with his project and reminded him that it was his (Mr. Robertson's) responsibility to "look" after him throughout the duration of this project, although the project may only take a few days to complete.

After their meeting they both entered a short report on the HELP desk system in order to keep everyone in the company, especially the steering committee, informed about the status of the original request for support that came from Mr. Jones. In his report Mr. Jones stated his satisfaction with the support he got from Mr. Robertson and that he is looking forward to a constructive relationship with him during this project. Furthermore, he stated that it really feels good to know there is someone he as end user can rely on, in case he runs into new problems during the design process of the system. In his short report Mr. Robertson stated that Mr.'s Jones problem was quickly solved and that they had an interesting discussion on the possible future application of technology in the training department and the he (Mr. Robertson) will definitely "put it on the table" the next time the IT department is doing long term planning.

Throughout the duration of Mr. Jones's project, Mr. Robertson made a point of it to keep in touch with him, so as to get informed how he (Mr. Jones) is progressing. The development of the system kept Mr. Jones busy for approximately three weeks, where-after he decided to terminate the relationship because the project has been completed. He did this by again entering a message on the HELP desk system thanking the IT department (by name Mr. Robertson) for keeping in touch with him during the project. He concluded his message telling that despite the fact that he knew the technology he was using to build the system, the support he got from Mr. Robertson was highly appreciated and most valuable because it gave him some new perspectives on the way to solve certain problems and that he now for the first time believed he is beginning to understand the culture of the IT people.

This case study sketches a situation where an IT professional who took up the responsibility to give service and support to a specific end user, not only solved the end user's problem but also created a relationship environment which made the end user enthusiastic about what he was doing.

Furthermore, the relationship environment ensured that the specific shortcomings in terms of the end user's skills and knowledge were addressed by scheduling the end user on the necessary training course.

This approach not only ensured that the specific end user will be able to cope in similar circumstances in the future without the need to ask for support from the IT department, but it also emphasizes the IT department's responsibility to educate all its end users.

Moreover the way in which the relationship between the specific end user and the IT professional was managed ensured a great deal of trust in the quality of service and support that was given by the IT professional. As such, this kind of service forms the basis for building future sound relationships.

4.2   Analysis of data

The ATLAS.ti software was used to perform the grounded theory data ordering, data analysis and theory development phases. The initial core categories (printer in bold) that were identified are depicted in Fig. 3. Furthermore, the process was used to identify the impact areas as well as the impact types of social relationships and networks.

4.2.1   Impact areas

The impact areas (with their related issues) of social nature are also indicated in Fig. 3. Here follows a brief listing of each.

The role of leadership within the project - The following issues are related to this impact area:

- The presence of a strong leadership component within the project;
- Importance of leadership *versus* procedures;
- The level of leadership and the project outcome;
- The level of support for leadership within the project team.

The project culture - The following issues are related to this impact area:

- The presence of a recognizable culture within the project;
- The effect of the project culture on the project team;
- The role of the project manager in determining the project culture;
- The project culture *versus* the organizational culture;
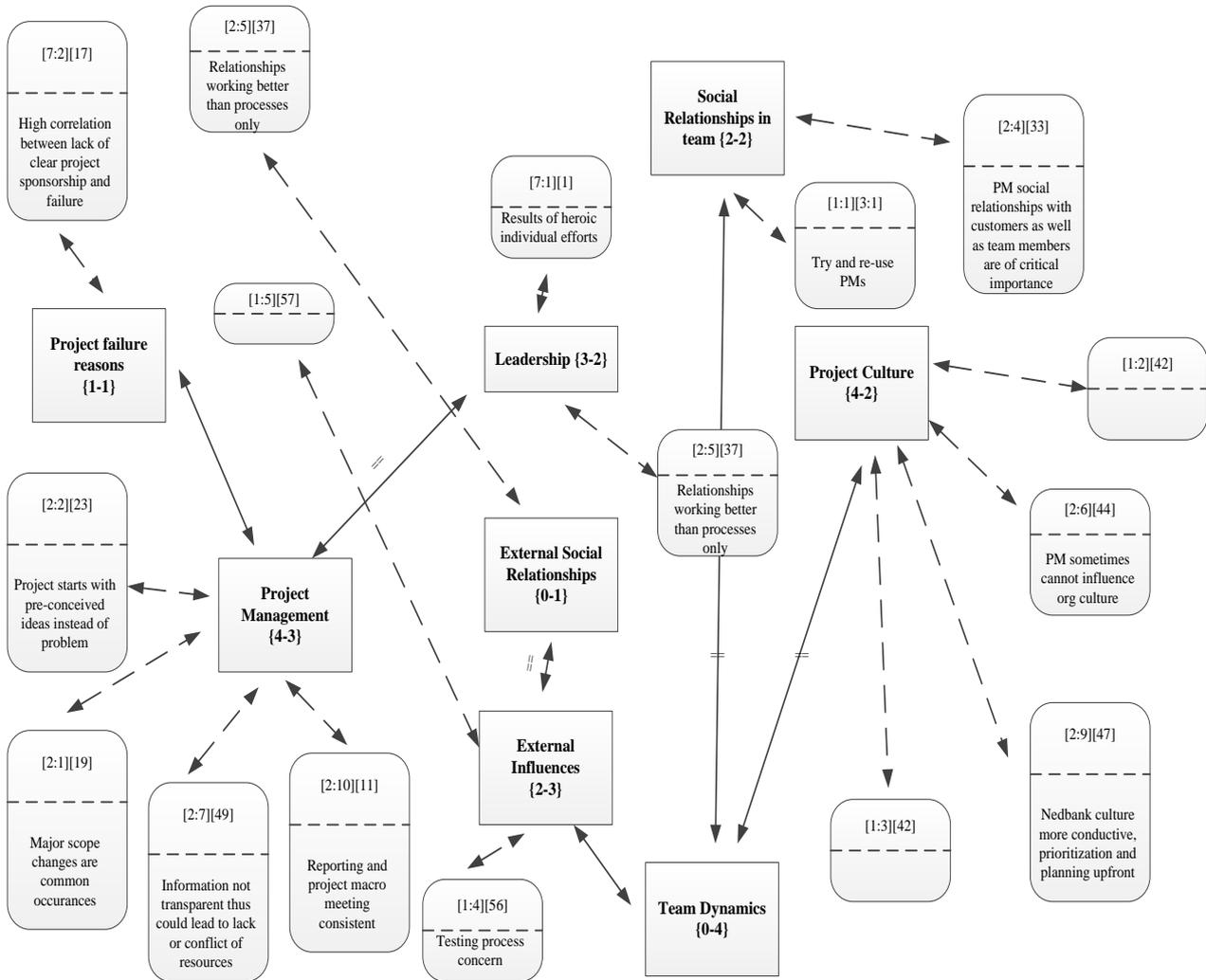- The influence of the project culture on the project outcome.

Fig. 3. Network View of Grounded Theory data; categories, impact types and areas

The social relationships between team members - The following issues are related to this impact area:

- The level of social relationships that develop between team members;
- How the social relationships are used within the project;
- The effect of social relationships on how team members view others.

The individual's external social networks - The following issues are related to this impact area:

- Which type of external social networks are utilized?
- What are the external social networks utilized for?

External influencing factors on the project - The following issues are related to this impact area:

- The effect of external factors on the project outcome;
- The types of external factors influencing projects.

These impact areas were used as basis for gathering more data by means of a survey. The survey and key findings are discussed in the next section.

4.2.2 Impact Types

Social relationships and networks are active in IS projects in three primary formats which are called impact types. They are as follows: influence; friendship; and advice.

Influence

Project team members establish social relationships within project team structures over time through their personal interactions. Stronger social relationships can be developed with some team members compared to others which can create areas of leverage for the individuals. These social relationships provide a platform for individuals to influence the project direction or decisions through:

- Influencing the project leadership;
- Influencing other team members to gain support for their own ideas and agendas;
- Using their social relationships to solve problems when project structures and procedure present a stumbling block;
- Influencing the project culture.

Harnessing this influence to the advantage of the project will increase the contribution of the specific individual to be greater than just their knowledge and skills.

Friendships

Some individuals develop social relationships with other project team members to such a level that it evolves into friendships that extend beyond the project structures. These friendships can result in the creation of certain social groupings within the project team that result in the alienation of other project team members, to the disadvantage of the project. Harnessing these friendships in the composition of new project teams can result in the creation of highly effective project teams that deliver beyond the sum of the capabilities of the individuals.

Furthermore, Leonard [10] states that these relationships have a very intrigue nature. According to him they consist of two dimensions, namely a physical and abstract dimension. The physical dimension describes those elements that are necessary in order to enable contact between team members, whereas the abstract dimension describes the soft issues of a relationship.

These two dimensions enable one to describe the holistic nature of such a relationship fully and to encapsulate the important elements of a support-oriented organization, namely mutuality, belonging, and connection. Because of the holistic nature of the different elements, Leonard [10] argues that any kind of change having an effect on any of the elements of either the physical or abstract dimensions of a relationship will in fact disturb the relationship. Based on this, one can argue that social relationships and networks that are disturbed needs to be managed in such a way that all role players stay focused and committed.

Advice

Individuals make use of their social networks outside of the project structures to gain advice to assist them in performing their tasks and to influence the project.

Individuals with strong and influential social networks can be advantageous to project teams as these networks can be used by other team members and to provide validity to the project.

These networks can assist greatly to identify possible external factors that could influence the project and develop associated actions to minimize potential negative impacts.

4.3 Summary of survey design and results

The survey was distributed to 100 participants across the two cases with 58 valid responses received.

As stated previously, the Likert Scale was used to measure the participants' views on the categories identified during the GT initial data collection phase.

The purpose of the survey was to:

- Gathering further information to saturate the categories identified during GT;
- Gathering personal views of participants in IT projects.

The survey illustrates clearly the huge role played by the establishment and use of social relationship and networks in a given IT project environment.

In summary, the survey indicates the following phenomena:

- In total 87% of the respondents indicated that social relationships between team members developed within the project teams as well as between members of other teams. Almost two thirds indicated that they developed stronger social relationships with some project team members than with other;
- Social relationships are used by team members within and around the structures created in the project environment;
- Project team members used their social relationships to solve problems whilst following project procedures as well as when the procedures proved to be a stumbling block in resolving the particular problem;
- A significant finding is that one in two respondents indicated that they made use of their social networks outside the organization to gain knowledge so that they could influence the project. Fig. 4 shows the variety of issues that could be applicable in this regard;
- A large number of participants indicated that the team members make use of their social relationships to the benefit of the project, but to their individual benefit as well.

4.4 Grounded theory research findings

In this section of the paper the results of the research project is discussed and illustrated.

The survey results were used to deductively evaluate the importance of social relationships and networks within IT projects.

The saturated network in Fig. 4 illustrates the role and importance of social relationships and networks in a typical IT project environment.

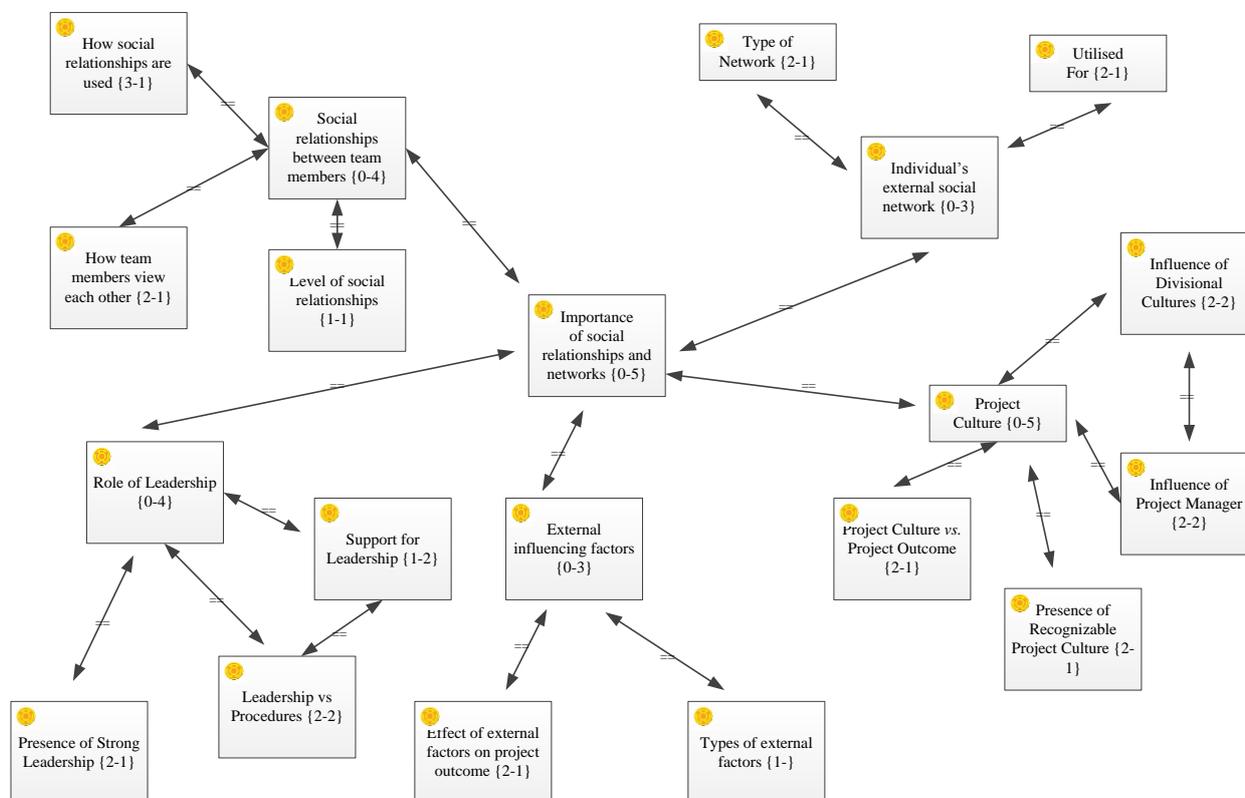At the end of this section a summary is given of the major findings.

Fig 4. Saturated GT network view of how social relationships and networks impact on the different aspects of an IT project environment

5. Summary of the major findings

The nature of IT projects normally requires high levels of team member interaction throughout the project life cycle and thus social relationships will develop between project team members. Two thirds of respondents indicated that they developed stronger social relationships with some team members than with others. This implies that social alignments or clicks can develop within project teams that must be monitored to prevent possible alienation of team members. Harnessing these groupings to the advantage of the project can provide momentum and energy toward successful project delivery. Some social relationships developed between project team members to such an extent that team members developed friendships that extended beyond the project environment. Although this phenomenon is on a personal level, this could also enhance or hamper performance which needs to be monitored.

Project team members use their social relationships primarily to solve problems and to gain some level of advantage. This could be regarded as a positive development in the sense that team members will, because of certain relationship, deal with their problems as quickly as possible and enhance the team performance as a whole.

External relationships and networks also play an important role. These social networks can be of a formal or informal nature. Formal networks include for example industry portals, special interest groups, past colleagues and information feeds, whilst informal networks include blogs, search engines and social networking tools. Individuals can also be used by other members in their social networks to influence the IT project. Influential business people can influence projects

by accessing project team members directly and thus bypassing project structures. Such interventions must be monitored as it could negatively impact on the project direction or results.

6. The literature comparison phase

The literature comparison phase in GT is aimed at comparing the emergent theory from the research with extant literature to improve the internal as well as the external validity. The most important work in this regard is that of Ashworth et al. [2]. They conducted research using social network theory and resource dependency theory to explain the importance and performance of human capital at team levels within organizations. The focus was on the impact of social position and the knowledge of the team members, on the team performance. Ashworth et al. [2] argue that the individual's knowledge and task execution contribute more than the individual's social relationships and networks to the overall team performance. The contribution of the individual's social networks is not discounted as being unimportant, rather placed lower in order of importance. The linkages used for social relationships and networks focused on friendship and advice within their research. This research can be viewed as complimentary and additional to the literature of social network theory.

7. Summary of the major findings

The following conceptual framework has been constructed using the research results of Leonard [10] as well as the insights obtained from the above mentioned grounded theory data and case studies.

Looking at the work of Leonard [10] and the above mentioned data, one can argue that the basis of any 'healthy' working environment for a project team would be an environment where sound relationships prevail most of the time. In this regard, it is important to take note of the abstract elements of the definition of a sound relationship environment. According to the definition a number of soft issues (*cf.* above) play an important role during the establishment and maintenance of sound relationships. Based on his work one can argue that *support* or a need for *collaboration* play an important role in the motivation for individual team members to reach out to other team members inside the project team or external to the project team. These two elements are referred to by Leonard [10] as a *supportive culture* and *cooperative behavior*.

Leonard [10] uses the following basic framework (Fig. 5) to explain the complex working environment of a project team.
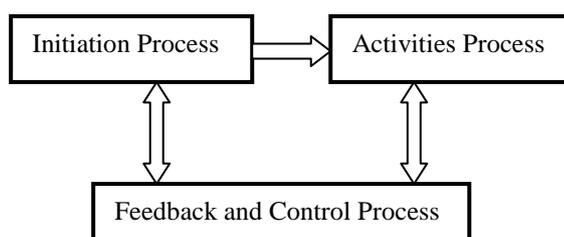

Fig. 5. Saturated GT network view of how social relationships and networks impact on the different aspects of an IT project environment

During the initiation process, end users and the IT department (IT professionals) start together as parties negotiating the terms and means of a specific software project. On the other hand, the activities process should be seen as the process where the rest of the project life cycle plays off. According to Leonard [10], the nature of the activities in this process impact positively or negatively on the different elements in the *physical* and *abstract* dimensions as was stated

previously in his definition. The *feedback and control process* is there to monitor this and to make the necessary changes to the project team environment.

For the purpose of this paper the activities process in Fig. 6 is used as basis to build the conceptual framework and is now explained in more detail.
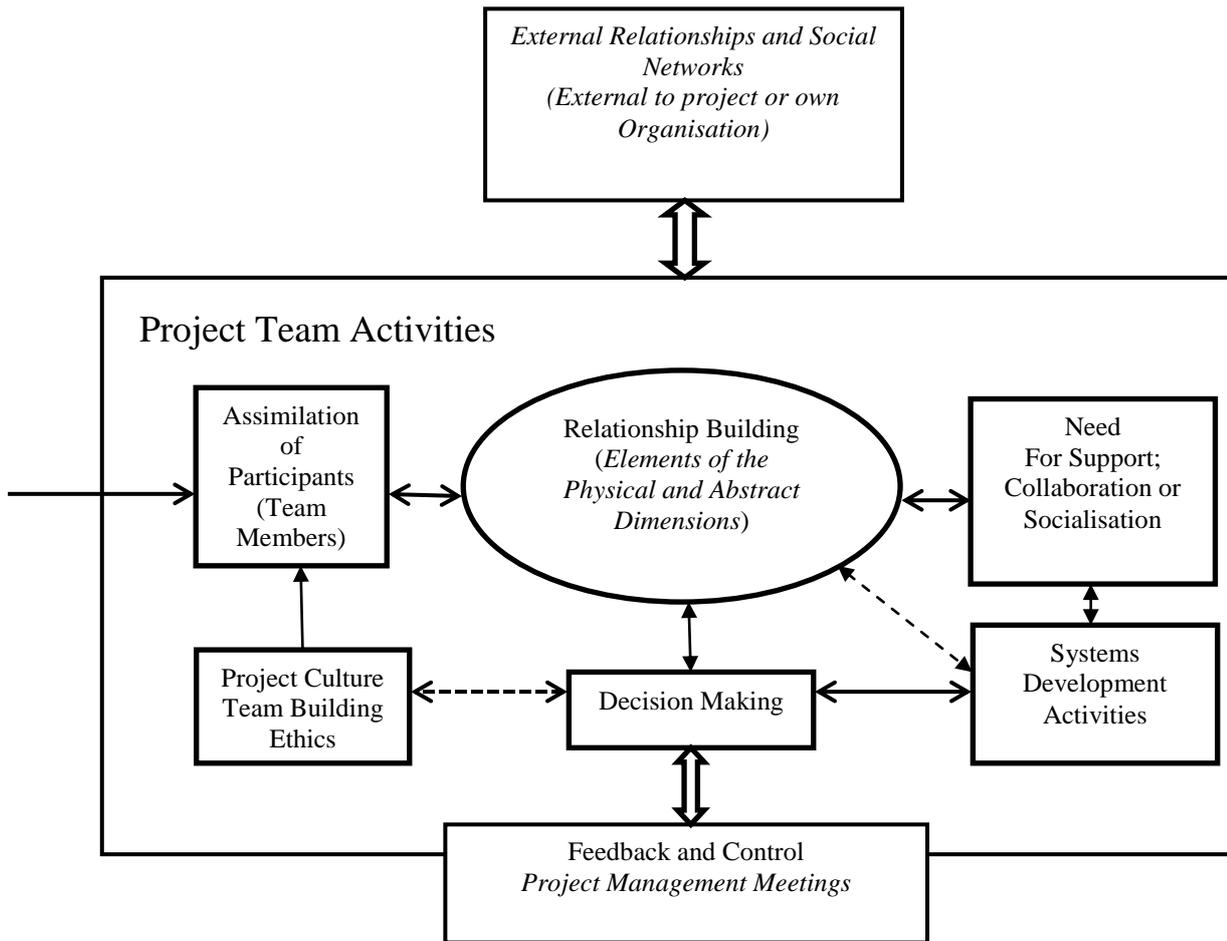

Fig. 6. Conceptual framework for explaining the role and impact of social relationships and networks in the software project team environment (based on the work of Leonard [10])

The main focus of the conceptual framework is to indicate that relationship building is one of the major activities in any software project environment. Team members are initially recruited or chosen from existing IT employees. These new members normally go through an initiation or team development program. Needless to say, in most cases new members start building relationships and also bring 'external' relationship 'links' to the team. As was mentioned earlier, these external relationships could be of a positive or negative nature.

Furthermore, team members do experience the need for collaboration and support as they perform their normal duties in the project team. These 'needs' can lead to the establishment of new relationships within the team or external to the team. As such, team members are influenced (positively or negatively) by other people about how to perform their duties within the project team environment. This will of course impact on decision making in the team and especially at the feedback and control process which normally takes place during project management meetings. In this regard it is also important to take note of the words of other researchers: Collaboration is a complex, multi-dimensional process characterized by constructs such as coordination ([5]), communication ([18]), meaning ([3]), relationships ([6]), trust ([12]) and structure ([1]). According to them the IS literature has discussed at length some factors that support successful collaboration. To put it in their own words: 'successful collaboration is the process through which a specific outcome, such as a product or desired performance, is achieved through group effort'. It follows that the forming of sound relationships inside or outside the project team for the purpose of achieving better results on project related activities should have a positive impact on individual member performance.

In summary therefore, the interpretation of the conceptual framework is as follows:

- Team members are allocated to a given project team. These team members join the team with existing internal and/or external relationships;
- Team members go through a team development process which helps them to understand the aims and objectives of the project. They also position themselves in terms of their respective roles and responsibilities;
- Within the project culture team members have to perform;
- To perform well, team members have to establish sound relationships with all colleagues in the project team;
- Team members can use their different (internal and external) relationships for professional purposes;
- These relationships have to be managed well for the benefit of the project team as a whole. This is the day-to-day responsibility of the project manager. This should also be monitored and managed during project management meetings.

8. Conclusion

The results of the research illustrate that project management philosophies and methodologies alone are not enough to achieve project success and that the social relationships and networks of project team members cannot be ignored. Each project team member contributes more than just their knowledge and skills to the project. Social relationships and networks will develop and evolve within IT project teams and need to be harnessed to the advantage of the project to improve the likelihood of a successful outcome.

This research identified impact areas as well as impact types of social relationships and networks on IT projects. These impact areas and types need to be considered when project teams are established as well as monitored throughout the project life cycle. Taking cognizance of the importance of social relationships and networks within IT projects can improve the management of technology and ultimately contribute to a greater success rate of IT projects.

Furthermore, it is argued that knowledge about social relationships and networks would provide a theoretically sound supplement to the existing literature that is of value to both academics and practitioners in information systems. The nature of such relationships could help IT management to make the right decisions with regard to the composition of teams and also in terms of enhancing a satisfied team member environment. The value for practitioners lies in the guidelines as to what aspects of social relationships and networks need to be considered in establishing and managing project teams. This knowledge also contributes to existing theories of why some projects could be regarded as successful and others as a failure.

It is clear that these social relationships and networks play an important role in the IT project environment. The results put a very important obligation on project managers' shoulders to take responsibility for these relationships and to 'allow' them for the benefit of each project and as such for the organization. One can argue that such relationships enhance easier communication regarding issues that are normally not discussed in a more formal project environment.

Here one can for example think of issues that need 'whistle blowing'. This brings us back to the importance of creating a project culture that should portray the following: 'Instead of shooting the messenger, managers would do well to establish (…) climate that encourages individuals to come forward with accurate project status information, regardless of whether the news is good or bad' [17]. Therefore, social relationships between IT professionals of different teams as well as with other employees in the organization are important to investigate on a deeper level. Furthermore, discussions between practitioners and academics should be encouraged to explore their impact on the normal operations of an IT department and ways to manage it in a professional way.

References

[1] P. S. Adler and B. Borys, "Two types of bureaucracies: enabling and coercive," *Administrative Science Quarterly*, vol. *41*, pp. *61–89*, 1996.

[2] M. J. Ashworth and K.M. Carley, "Who You Know vs. What You Know: The Impact of Social Position and Knowledge on Team Performance," *The Journal of Mathematical Sociology*, vol. *30*, no. *1*, pp. *43-75*, 2006.

[3] B. A. Bechky, "Sharing meaning across occupational communities: the transformation of understanding on a production floor," *Organization Science*, vol. *14*, no. *3*, pp. *312–330*, 2003.

[4] S. Collinson, "Knowledge networks for innovation in small Scottish software firms," *Entrepreneurship & Regional Development*, vol. *12*, no. *3*, pp. *217-244*, 2000.

[5] S. Faraj and L. Sproull, "Coordinating expertise in software development teams," *Management Science*, vol. *46*, no. *12*, pp. *1554–1568*, 2000.

[6] J. J. Gabarro, "The development of working relationships," in *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*, J. Galegher, R. E. Kraut and C. Egido, Eds., New Jersey, USA: Lawrence Erlbaum Associates, 1990, pp. *79–110.*

[7] M. Gargiulo and M. Benassi, "Trapped in your own net? Network cohesion, structural holes and the adaptation of social capital," *Organizational Science*, vol. *11*, no. *2*, pp. *183-196*, 2000.

[8] D. S. Hovorka and K. R. Larsen, "Enabling agile adoption practices through network organizations," *European Journal of Information Systems*, vol. *15*, pp. *159-168*, 2006.

[9] A. Kadefors, "Trust in project relationships – inside the black box," *International Journal of Project Management*, Vol. *22*, no. *3*, pp. *178-182*, 2004.

[10] A. C. Leonard, "A Conceptual Framework For Managing Relationships between all Participants During IT Service And Support Activities," *South African Journal of Industrial Engineering*, vol. *13*, no. *2*, pp. *81-96*, 2002

[11] J. Liebowitz, "A look at why information systems fail, Kybernetes," *The International Journal of Systems & Cybernetics*, vol. *28*, no. *1*, pp. *61-67*, 1999.

[12] D. Meyerson, K. E.Weick and R. M. Kramer, "Swift trust and temporary groups," in *Trust in organizations: Frontiers of Theory and Research*, R. M. Kramer and T. R. Tyler, Eds., Thousand Oaks, USA: Sage, 1996.

[13] B. H. Reich and I. Benbasat, *Factors that influence the social dimension of alignment between business and information technology objectives*, Society of Information Management (SIM) and the Management Information Systems Research Center (MISRC), 1999.

[14] C. Sauer, *Why Information Systems Fail: A Case Study Approach*, New York (NY), USA: Wiley, 1993.

[15] C. Standing, "Myths and the art of deception in information systems," *Work Study*, vol. *47*, no. *1*, pp. *5–13*, 1998.

[16] C. Standing and A. Bavington, "Implementing and using a structured information systems methodology," *Accountability and Performance,* vol. *2 (2)*, pp. *51-68*, 1996.

[17] H. J. Smith and M. Keil, "The reluctance to report bad news on troubled software projects: a theoretical model," *Information Systems Journal*, vol. *13*. pp. *69–95*. 2003.

[18] K. E. Weick and K. H. Roberts, "Collective mind in organisations: heedful interrelating on flight desks," *Administrative Science Quarterly,* vol. *38*, no. *3*, pp. *357–382*, 1993.

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