A grounded theory research investigation into the importance of social relationships and networks within corporate Information Systems Projects

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ABSTRACT

The purpose of this research is to consider the importance of social relationships and networks within the structures of Information Systems projects.

A grounded theory research was conducted making use of project documentation to identify core categories which were supplemented with a survey directed at all levels of project team members. Interpretive patterns from grounded theory enabled inferences to be drawn on the role of social relationships and networks within IS projects.

The social and political nature of IS projects requires that social relationships and networks are considered when project teams are created and monitored throughout the project lifecycle since project management philosophies and methodologies are not enough to achieve project success. Social relationships and networks were found to have three impact types on IS projects being a) influence, b) friendships and c) advice. Social relationships and networks were found to impact IS projects in areas of leadership, project culture, social relationships within project teams, the use of external social networks and the managing of external influences.

The choice of limiting the research to a single large corporate organisation requires that further research is needed to corroborate the findings in order to make generalisations. The research findings provide practical considerations and highlights potential problems areas in the project lifecycle that need to be taken cognisance of irrespective of the chosen project management methodology.
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CHAPTER 1
BACKGROUND AND RESEARCH OBJECTIVES

1.1 Introduction
Information technology (IT) divisions are coming increasingly under scrutiny in big corporate organisations due to the ever-increasing portion that IT spending forms of their total budgets. Organisations have invested heavily in IT projects and infrastructure and received in return little value or less than the promised benefits.

Furthermore, the collapse of a substantial number of dot-coms since the beginning of the century has placed greater emphasis on managing IT expenditure. The cost-value benefit of this increased spending and the corresponding actualised benefits, in particular relating to information systems (IS), are being questioned and monitored more closely than ever.

King (2002) has reported a major shift towards more hands-on and traditional IT project management as a means of controlling spending and delivering profitable projects. Despite this shift in approach there still exists an unacceptably high level of IS failure (Yeo, 2002).

The topic of IS failure is a popular IS research topic and has had extensive research done on it. The article by Liebowitz identifies a detailed level of such causes of IS failure, which can be classified into the failure of the technology and the management of the technology (Liebowitz, 1999).

This research relates to the management of the technology, and in particular to the effect of social networks in this management process.
Chapter One introduces the research, and in particular discusses the problem statement, research objectives and the research approach followed. This chapter also contains an overview of the remaining chapters.

1.2 Background
The widespread introduction of IT into organisations has transformed the allocation of processes, thought processes and the allocation of available resources. IT project management has played a driving role in the dissemination of IT into organisations but it does not have a glowing track record. IS project failure is well documented, and in conjunction with the competition for finite resources within organisations, there is a growing emphasis on obtaining value for the money spent.

1.2.1 Introduction to Information Systems Project Failure
A review of the literature paints a bleak picture in terms of the success rates of IS projects (Whyte & Byhteway, 1996; Liebowitz, 1999; Sauer, 1993). The view exists that IS failure is much more prevalent than success, and even as many as one in two IS projects attempted will not be successful (Galloway & Whyte, 1989; Lytytinen, 1988 cited in Whyte & Bytheway, 1996).

The Standish Group produces a yearly CHAOS report that indicates the rate of success of IS projects. The results are divided into three types:

- Type 1 – completed on time and within budget
- Type 2 – completed with budget overruns, time wastage or reduced functionality
- Type 3 – cancelled or discarded before completion

Table 1.1 illustrates the progress that has been made in terms of IS project success rates, based on the results from the CHAOS reports in 1995 and 2004. Although the success rate has increased by over 100% it still paints a bleak picture.
### TABLE 1.1

<table>
<thead>
<tr>
<th>Project Outcome</th>
<th>Resolution</th>
<th>1995 %</th>
<th>2004 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Successful</td>
<td>16.2 %</td>
<td>34 %</td>
</tr>
<tr>
<td>Type 2</td>
<td>Challenged</td>
<td>52.7 %</td>
<td>51 %</td>
</tr>
<tr>
<td>Type 3</td>
<td>Impaired</td>
<td>31.1 %</td>
<td>15 %</td>
</tr>
</tbody>
</table>

Table 1.1: Project Resolution by Type (Adapted from Yeo 2002 & SoftwareMag.com 2004)

A broad range of influencing factors is supplied by Liebowitz. These range from the technology used in the IS project to the management of the technology itself. Defining a successful IS project is not an easy task, as the different views involved in the project, will each have their own criteria.

Project managers, technological experts and the eventual end users will have different expectations of the IS project and thus have a different set of success criteria that are used for evaluation. Standing (1998) emphasises this problem facing IS projects, by pointing out the following:

“Groups within organisations create constructions of reality that protect their identity and provide security. This can sometimes be seen in information systems development when one group views the project as a success while the other sees it as a failure.”

Liebowitz (1999) feels that the greatest threat to the success of any IS project is the failure to communicate. It is in particular this statement that draws the attention to the problem area of the research.

### 1.3 Problem statement

Sauer (1993) believes that a major part of the problem of IS failure is the lack of recognition that IS development is largely a social and political process. This view is also shared by Standing (1998). Considerable effort
has already been spent on the process of managing IS projects and has produced multiple methodologies and methods for project management and the IS software development lifecycle (Standing & Bavington, 1996).

This research is not aimed at determining which of these methodologies and methods are the most suitable for IS projects, rather it is aimed at determining whether social relationships and networks within and between the IT teams, participating in the IS projects, influence the success or failure of such IS projects.

The research findings are intended to be used in conjunction with the chosen project management and IS development methodologies chosen for specific IS projects.

The area of social relationships and networks within and between IT teams forms the problem area for this grounded theory research. In particular, the research has looked at IT teams within a corporate organisation as the environment in which the IS projects were executed.

The researcher has chosen one of the large South African financial banks as the specific corporate environment. This organisation also undertakes a considerable number of IS projects on an annual basis.

1.4 Research Objectives

1.4.1 Primary Research Question

Based on the information analysed during the initial literature review and personal experience the following question was identified:

Do the social relationships and networks within corporate information system projects influence the outcome?
1.4.2 Secondary Research Question
During the grounded theory execution 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?
- Does the use of external consultants/contractors influence the social relationships and networks within a project team?

1.5 Research Approach
1.5.1 Paradigm
The paradigm used for the research is that of interpretivism. The interpretivist paradigm is discussed from an ontological and epistemological point of view.

a) Ontological View of Interpretivism
Interpretivists believe that reality and the individual that observes it cannot be separated (Weber, 2004). This view is based on the belief that humans cannot distance themselves from their own experiences and their belief-systems from their observations. Thus humans will apply their intrinsic knowledge to make conclusions/observations on what they perceive to be reality.

The researcher thus looks with an insider’s view at what effect if any, social networks have on the success of IS projects, based on their own experiences and belief-systems.
**b) Epistemological View of Interpretivism**

Interpretivists believe that reality does not exist independent of the researcher. Interpretivists try to make sense of the world, recognising that their sense-making activities occur within the framework of their life-worlds and the particular goals they have in accomplishing their work.

Knowledge is built through social construction of the world (Weber, 2004). The interpretive researcher thus believes that there is not just one truth. Thus their own truth is developed through the understanding that they gain throughout the research effort, based on their own experiences and belief-systems (qualitative).

The interpretivist view of truth is, that since it is their own, the process that they have used must be viewed as reasonable, and it needs to be accepted as valid.

**1.5.2 Methodology and method**

The methodological approach of the research is ideographic on account of the interpretivistic research approach. The research method used is that of *grounded theory*. Grounded theory is the method used to arrive at systematic and deductive research results from the continued collection and the subsequent analyses of such data (Roode, 2007c; Thomas, 2003).

The data form and highlight the actual research problem, as it becomes clear from the analysis of such data. In a grounded theory approach the researcher starts with an interest in a specific area and lets the data guide the identification of the research problem, instead of just using the data for verification or testing purposes.

This approach allows for modification or alteration of the research problem as and when new information becomes available during the data-gathering and analysis processes.
Information was primarily obtained from project documentation from 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.

The method is described in detail in Chapter Two.

1.6 Expected Findings
The researcher expects to experience some difficulties during the data analysis phase of the research, as it is the first time that the researcher will have used the grounded theory approach. The creation of the survey subsequent to the category identification should be less of a challenge as the categories identified during the grounded theory execution will guide the survey.

The researcher believes that using the survey will not only assist in sorting the data into the correct categories, but will also provide insight into the individual perspectives of the project team members.

1.7 Limitations of the research
ICT project management and IS project management in particular, vary in scale and complexity, as they are practised in a wide variety of circumstances and are aimed at achieving a number of goals. This research does not attempt to cover the wide spectrum of possibilities, but focuses on the delivery of IS projects in a large corporate banking environment.

This research places further emphasis on the social relationships and networks within IS projects. This research will be bound by the following constraints:
• This research will focus on the importance or lack of importance of the social relationships and networks within IS projects, instead of the specific project management methodology followed.
• The research results will recommend factors that need to be considered during the project lifecycle and especially for the selection of a project team.
• The results of the research will be primarily applicable to the financial services sector.
• The results of the research are intended to be used in conjunction with popular project management methodologies.

1.8 Contribution to the field of Information Systems
The IS 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 IS projects.

The research attempts to provide a theoretically sound supplement to the existing literature that is of value to both academics and practitioners in information systems.

The research provides academic value by expanding on the existing success and failure factors theory in the IS field, placing focus on the social aspects within IS projects. The value to practitioners lies in the guidelines as to what aspects of social relationships and networks need to be considered in establishing and managing project teams.

1.9 Structure of the research
The purpose of this section is to provide a high level summary of the chapters presented in this research.
Chapter 1
Chapter One provides an introduction to the research and focuses primarily on the research details, objectives and the hierarchical approach.

Chapter 2
The theory of Grounded Theory. This chapter provides an overview of the Grounded Theory approach and describes the data analysis framework used during the research.

Chapter 3
An ICT Project Management overview. This chapter provides an overview of the predominant ICT project management philosophies and methodologies.

Chapter 4
A Social relationships and Networks overview. This chapter provides an overview on how social relationships and networks are constructed and used in cross-functional teams.

Chapter 5
Grounded Theory data interpretation. This chapter discusses the results of the grounded theory execution based on the data in the form of project documentation and the survey results.

Chapter 6
Conclusions, recommendations and future research. This chapter is the final chapter and summarises the research. Recommendations are made and attention is drawn to possible future research topics.
1.10 Conclusion

The importance of information technology within organisations is growing, as well the resource and funding allocation for such related endeavours. IS projects have a tainted track record which does not bode well for organisations, since a substantial portion of their limited resources is allocated to these projects.

Organisations are tasked with creating wealth and cannot afford to keep spending money on projects that are as likely to fail as to succeed. Recognition has been made of the role of the management of technology in IS failure and this research attempts to provide more light on the role of social relationships and networks in the area of managing technology, especially as this relates to IS projects.
CHAPTER 2
THE THEORY OF GROUNDED THEORY

2.1 Introduction

The literature dealing with Grounded Theory (GT) as a research approach, is dominated by the works of Glazer and Strauss (1967), and Strauss and Corbin (1990). The GT method was first presented by Glaser and Strauss (1967) in their book, *The Discovery of Grounded Theory*. It is best described as the process of building theory that is based on raw data that have been systematically reviewed and analysed (Esteves et al., 2002).

GT is thus aimed at allowing the researcher to develop theoretically sound explanations regarding a specific phenomenon based on an inductive approach. Strauss and Corbin (1990) explain the GT approach as:

“…one that is inductively derived from the study of the phenomenon it represents. That is, it is discovered, developed, and provisionally verified through systematic data collection, analysis, and theory that stand in a reciprocal relationship with each other.”

This implies that the researcher does not start with a hypothesis that he or sets out to prove or disprove, but rather researches a study area and allows the pertinent aspects of the area to rise to the surface.

Thomas (2003) further explains the inductive approach:

“Inductive approaches are intended to aid an understanding of meaning in complex data through the development of summary themes or categories from the raw data (‘data reduction’).”
The key feature of GT is that the researcher does not begin with a specific theory in mind and then tries to prove its validity; the researcher rather begins with an interest in a phenomenon or area of study and lets the data guide his research questions and findings. The specific questions thus emerge to the researcher as the GT process is followed (Roode, 2007c; Thomas, 2003; Esteves et al, 2002; Pandit, 1996).

According to Baker et al. (1992, cited in Esteves et al, 2002), researchers use the GT method to identify the processes and its associated subsidiary processes that lies at the core of a social situation. These processes serve as the linkage between the majorities of the processes forming part of the explanatory network of the situation and will be the focal point of the analysis.

Haig (1995, cited in Esteves et al. , 2002) explains that a good GT is characterised by the following aspects:

- It is derived inductively from raw data
- It is theoretically elaborated
- It is reviewed as adequate against its domain utilizing defined evaluation criteria.

Esteves et al. (2002) proposed the following criteria for GT, based on the recommendations of Turner (1987):

- Does the emerged theory fit firmly within the parameters of the social environment within which it is concerned?
- Will researchers whom are familiar with the phenomenon being investigated find the developed theory to be accurate, sound and to be providing new light on the subject?

GT was initially developed in conjunction by Anselm Strauss and Barney Glaser, but the two authors had a disagreement in ideas and methodology that resulted in GT being divided into two distinct paths: a) Corbin and
Strauss’s method, and b) Glaser’s orthodox method. Two viewpoints disagreed on the procedural process and conclusions of the GT approach, but are both based on the premise of conducting constant analysis, theoretical sampling and memo making, as these activities ensure the objectivity of the process (Rennie, 1998).

The remainder of this chapter discusses in further detail the GT method, and this is based on the method followed by Pandit (1996).

2.2 Elements of Grounded Theory
GT is characterised by three primary elements (Pandit, 1996):
- Concepts
- Categories
- Propositions

2.2.1 Concepts
In GT, although the theory is based on raw data it is developed from the conceptualised interpretation of the database. These concepts thus form the basic units of analysis that the researcher is trying to identify, as Corbin and Strauss (1990) explain:

- The raw data are the observed and reported incidents and activities such as happenings and events. Through the analyses of the raw data conceptual labels are assigned to assist in identifying potential indicators of the researched phenomenon. The raw data itself does build the theory.
- The researcher builds the theory by grouping the conceptual labels into basic units and refining it into
- Only by comparing incidents and naming like phenomena with the same terms can the theorist accumulate the basic units for theory.
2.2.2 Categories

Concepts are still a relatively low level of representation of the raw data. This needs to be abstracted to a higher level to allow for the identification of themes and groupings that integrate the theory. As Corbin and Strauss (1990) explain:

- Categories are generated following the same process of analysis used to identify the base concepts but instead of using the raw data, the low level concepts are the target of the analysis. Categories are thus at a higher level and more abstracted the underlying concepts.
- Categories thus form the underlying foundation or glue that binds the theory together.
- Categories are the abstract headings that the researcher uses to group concepts together which may seem unrelated at face value, but in fact aim towards similar processes.

2.2.2 Propositions

Pandit (1996) proposed that the third element of the GT method to be *propositions*. He argues that propositions illustrate the relationships between categories, their concepts as well as between categories themselves. Pandit replaced the original third element, hypotheses, of Glaser and Strauss (1967) with propositions based on the argument of Whetten (1989, cited in Pandit, 1996) that:

“Propositions involve conceptual relationships, whereas hypotheses require measured relationships. Since the grounded approach produces conceptual and not measured relationships, the former term is preferred.”
2.3 The Process of Grounded Theory Building

GT consists of five analytical phases:

- Research Design
- Data Collection
- Data Ordering
- Data Analyses
- Literature Comparison

These phases do not have to be executed in a sequential order but together they form the framework for the GT method. The five phases consist of nine steps that are followed in the GT method, as illustrated below in Table 2.1.

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Table 2.1: The Process of Building Grounded Theory (Pandit 1996)

The five phases and associated nine steps of the GT method are measured in terms of quality, against the following criteria:

- **Construct Validity.** Clearly specified operational procedures are followed during the research process.
- **Internal Validity.** Causal relationships exist that illustrate the interlinked relationships between specific conditions. The internal validity forms the credibility of the research.
- **External Validity.** A clear domain is established against which the research’s findings are generalised.
- **Reliability.** The findings from the research can be repeated with the same operational procedures.
2.3.1 Research Design Phase

Research design is the first phase of the GT method and consists of two steps:

- Review of technical literature
- Selecting cases

Easterby-Smith et al. defines research design (1990, cited in Pandit, 1996) as:

“... the overall configuration of a piece of research: what kind of evidence is gathered from where, and how such evidence is interpreted in order to provide good answers to the basic research question[s].”

a) Reviewing the technical literature

The first step is that of reviewing the technical literature. During this step the basic research questions are identified and defined. The researcher must take care in defining the basic research questions to ensure that these questions allows the researcher to focus the research, whilst still maintaining room for flexibility as the data are analysed.

The problem area that is to be researched is thus identified instead of a hypothesis that needs to be tested. According to Strauss and Corbin (1990, cited in Pandit, 1996), technical literature are good sources of research questions. Primary examples of technical literature are research reports, theoretical papers and philosophical papers.

b) Selecting the cases

The second step, that of selecting the cases, follows once the researcher is confident that the a priori constructs are focused but broad enough. Cases form basic units of data in the research and should be selected based on sampling principles that are accepted to be theoretically sound (Pandit, 1996).
c) Theoretical Sampling Principles

The theoretical sampling cannot be planned before the GT study, as the decisions guiding the sampling process, emerge and evolve during the GT research. This is due to the researcher jointly collecting, coding and analysing the data, during the data-collection process (Glaser & Strauss, 1967; Strauss & Corbin, 1990; Pandit 1996; Tyaki, 2005; Esteves et al., 2002).

The main categories emerge during the initial data collection. Only during this activity a deep data coverage is required, since during the following sampling activities data are only gathered on the categories until the category’s or theory’s theoretical saturation is reached. Glaser and Strauss (1967) define this point as:

- when the researcher cannot further develop the category’s properties with additional data. The researcher finds the same instances and cannot attribute the findings to other categories.
- when the researcher is forced to analyse different or new sets of data and identifies other categories. The researcher will continue until these categories are also saturated.

Core categories should be saturated to the greatest extent, whilst less important categories should be explored to a lesser extent, as not all categories will have the same relevance to the problem area being researched. The accuracy of GT depends on the ability and skill of the researcher to identify the core categories and not to be distracted by less important categories.
2.3.2 Data-Collection Phase

The GT method allows and encourages the use of multiple data sources pertaining to the research problem area or phenomenon. These sources are referred to as slices of data (Pandit 1996, Esteves et al., 2002).

A primary data collection method may be relied upon, but secondary methods are required to ensure that correct levels of saturation are achieved. Furthermore, the use of multiple-data slices improves the construct validity and reliability of GT.

a) Rigorous Data Collection

The third step is the development of a rigorous data-collection protocol. This is achieved by using multiple-data gathering methods. Qualitative as well as quantitative data must be gathered and will form the basis of the case study database.

The two primary data sources are the two case studies of IT projects in the corporate environment (Nedbank Group Technology and Nedbank Personal Loans IT). Both cases are within the same corporate environment with one in the centralised environment and the second in the decentralised environment. Information was obtained from semi-structured interviews, a survey and project documentation.

Case study databases were constructed, making use of the qualitative data analysis software package ATLAS.ti. The researcher was drawn to this package through the article by Pandit (1996) and the thesis of Wessels (2007).

b) Entering the field

The fourth step is the entering of the field information. The data are collected and analysed simultaneously to allow for adjustments in the
data collection, as emergent themes become visible. This dual action creates the flexibility of the GT method.

2.3.3 The data-ordering phase
The fifth step is to order the data from the case studies chronologically. Yin (1989, cited in Pandit 1996) explains the advantages of this approach as:

- allowing the researcher to investigate causal events over time and not be prejudiced to delayed effects
- the chronological approach is more likely to include various types of variables and thus not limited to a few independent or dependent variables

2.3.4 The data-analysis phase
The sixth step is to analyse the ordered data to create the theoretical framework of the research. In GT the data-analysis phase is central to the method and is tightly integrated with data-collection and data-ordering phases. These integrated relationships provide a general framework for data analysis and are depicted in Figure 2.1 below:
The main procedure within the data-analysis phase is that of coding. The coding procedure can divided into three distinct activities (Pandit, 1996; Esteves et al., 2002):

- Open Coding
- Axial Coding
• Selective Coding

a) Open Coding
Open coding consists of the labelling of concepts relating to the phenomenon being researched. These concepts represent the building blocks within the GT construction. Open coding is driven by the asking of questions such as what? when? where? How? and suchlike, followed by the making of comparisons.

Categories are identified and created by the grouping of similar concepts at more abstract levels.

b) Axial Coding
During axial coding the connections between categories are identified. These connections are used to put data back together in new ways. Through axial coding main categories and related sub-categories are identified and developed.

c) Selective coding
During selective coding the initial theoretical framework is created through the integration of the developed categories. Selective coding identifies the core category and systematically relates this category to the other categories. These relationships identified are validated using the paradigm model. This model uses data for the validation of linkages between categories and to further fill in categories that require refinement or further development.

d) The Paradigm model
The paradigm model used in selective coding is depicted in Figure 2.2.
Figure 2.2: The Paradigm Model used in Selective Coding (Pandit 1996)
In the paradigm model used in selective coding, the phenomenon represents the core category and other categories are related through the schema of the model. The causal conditions refer to the events and actions that lead to the identification and development of the core category, the phenomenon. The phenomenon is set and occurs within a specific combination of conditions and associated intervening conditions, that constitute the context.

The action/interaction strategies refer to actions and responses resulting from the phenomenon, while the consequences are the intended and unintended results of these actions and responses (Pandit, 1996).

d) Memos
During the coding process the researcher also writes memos. Memos are used during the analytical process to track categories, properties and questions that evolve. Memos are integral to the formulation and revision of theory in the GT method (Corbin & Strauss, 1990).

e) Theoretical sampling
During the seventh step, the theoretical framework identified in step six, is tested and further developed using additional cases. These additional cases are used to further develop and refine categories in the theoretical framework. These cases are selected in accordance with the principles discussed in section 2.3.1 (c).

f) Reaching closure
The eighth step is based on the principle of theoretical saturation and is reached when no more value is created by any additional data.
2.3.5 Literature comparison phase

The ninth and last step is the comparison of the emerged theoretical framework / theory with existing literature. The reasoning for this comparison is explained by Eisenhardt (1989, cited in Pandit, 1996):

- Increases the internal validity and makes the theory more generalisable
- Reduce the concerns of using limited cases

2.4 Conclusion

GT is aimed at allowing the researcher to develop theoretically sound explanations regarding a specific phenomenon, based on an inductive approach. In GT, the resulting theories emerge from the data and are not aimed at the testing of a hypothesis. Data are thus collected from samples as early as possible and do not wait for the establishing of clear research questions or a hypothesis.

In GT, the data-analysis phase is performed concurrently with the data-gathering phase which results in dynamic sampling based on the principles of theoretical sampling (Esteves et al., 2002). The coding process is a fundamental part of the GT method and is aimed at the comparison, linking and reduction of categories to form the theoretical framework. GT also advocates the use of multiple-data sources and does not restrict the researcher to qualitative or quantitative data sources.

The power of GT lies therein that the data are used to derive the theoretical framework. The value of the research is however dependent on the accuracy of the researcher in interpreting the data and determining the saturation of categories (Esteves et al., 2002).
CHAPTER 3
AN ICT PROJECT MANAGEMENT OVERVIEW

3.1 Introduction
This chapter is aimed at providing a high level overview of ICT project management to provide a context for the research. This chapter will briefly discuss the predominant ICT project management philosophies and methodologies.

The ICT project management sphere is dominated by two philosophies (Warne, 2006; Sutherland & Schwaber, 2007):
- The traditional Waterfall philosophy
- The Agile philosophy

a) The Traditional Waterfall philosophy
The Waterfall philosophy is characterised by a detailed requirement gathering and planning phase wherein the exhaustive requirements are identified, analysed and documented in detail. This requirement is frozen and serves as the basis for duration estimation and the development of the end product. Work is completed in sequence throughout the execution phase similar to a production assembly line, until it reaches the quality assurance phase.

The testing of the product is based on the detailed specification document before it is handed over to the user for acceptance. The activities within the Waterfall are performed in a logical and controllable sequence, but are not conducive to changing requirements.

b) The Agile philosophy
The Agile philosophy is based on the Agile Manifesto and is aimed at producing workable products in shorter delivery cycles that are adaptable to
changing requirements. Cockburn (2000) defines the Agile Alliance as follows:

"We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan.

That is, while there is value in the items on the right, we value the items on the left more."

The agile philosophy aims to deliver constantly in increments and place less focus on the processes and specification phases.

### 3.2 The Project management body of knowledge

The Project Management Body of Knowledge (PMBOK) is generally accepted as best practice for project success. PMBOK is developed and maintained by the Project Management Institute (PMI). PMBOK is recognised as an international standard (IEEE Std. 1490-2003) and American National Standard (ANSI/PMI 99-001-2004), and serves as a driving force in transforming project management into a discipline aimed at providing the project management community with a robust and recognised collection of processes and procedures of good practice (Chaudhuri & Vainshtein, 2007; Haughey, unk; Warne, 2006).

PMBOK consists of five basic process groups or project phases and nine knowledge areas. Within these nine knowledge areas there exist forty-four project management processes. Haughey (unk) identifies the five basic process groups as:

- Initiating
- Planning
- Executing
• Monitoring and Controlling
• Closing

The nine knowledge areas are (Haughey, unk; Warne, 2006):
• Integration
• Scope
• Time
• Cost
• Quality
• Human Resources
• Communications
• Risk
• Procurement

Figure 3.1 illustrates the nine knowledge areas and their associated project management processes:
3.2.1 Knowledge areas
This section is based on the PMBOK overview of Warne (2006).

a) Integration
This knowledge area consists of the processes that initiate, co-ordinate and close the specific project and it thus coordinates all knowledge areas and associated processes across PMBOK. The specific processes during integration are:
• Developing the Project Charter
• Developing the Scope Statement
• Developing the Project Plan
• Direction and Management of the Project Execution
• Monitoring and Controlling the work
• Managing the Change Controls
• Closing the Project

b) Scope
The processes in this knowledge area are concerned with the definition of the project and need to ensure that work performed is limited only to what is required to successfully complete the project. This is achieved by means of the following processes:
• Planning the Scope
• Defining the Scope
• Creating the Work Breakdown Structures (WBS)
• Verifying the Scope

c) Time
The processes in this knowledge area are concerned with the identification, estimating and sequencing of specific activities with elements of the WBS from the project scope. The specific processes are:
• Defining the Activities
• Sequencing the Activities
• Estimating the Activity Resources
• Estimating the Activity Duration
• Scheduling Development
• Scheduling Control

d) Cost
The processes in this knowledge area relate to the planning, estimation, budgeting and control of the project’s financial budget. The resource costs
of the activities relating to the WBS within the project plan are determined as well as controlling the costs of any deviations from the project plan. The specific processes are:

- Estimating the costs
- Budgeting for the costs
- Controlling the costs

e) Quality
The processes in this knowledge area relate to the definition, monitoring and corrective action of quality standards of the specific project. The specific processes are:

- Quality Planning
- Quality Assurance
- Quality Control

f) Human Resources
The processes in this knowledge area relate to the creation, management and control of the project team. Roles and responsibilities within the project team are identified and documented to allow for the tracking of competencies and the monitoring of team dynamics. The specific processes are:

- Human Resource Planning
- Creating the Project Team
- Developing the Project Team
- Managing the Project Team

g) Communications
The processes in this knowledge area relate to ensuring that the right information is provided to the correct involved parties. The relevant communication methods and associated information for the project stakeholders are established. The specific processes are:

- Communications Planning
- Distributing Information
h) Risk
The processes in this knowledge area relate to the planning, identification and performing of risk management. The risk plan is created, maintained and associated with the mitigation actions that are monitored. The specific processes are:

- Risk Management Planning
- Risk Identification
- Qualitative Risk Analysis
- Quantitative Risk Analysis
- Risk Response Planning
- Risk Monitoring and Control

i) Procurement
The processes in this knowledge area relate to the procurement or contracting of third parties. This applies to the role of either buyer or seller through a bid process in relation to the project plan. The specific processes are:

- Planning Purchases and Acquisitions
- Planning Contracting
- Requesting Seller Responses
- Selecting Sellers
- Contract Administration
- Contract Closure

3.3 PRINCE 2
Projects in Controlled Environments (PRINCE) is the project management standard widely followed in the public and private sectors of the United Kingdom (UK). PRINCE was developed by the Central Computer and
Telecommunications Agency (CCTA) in 1989 aimed at managing ICT projects in the UK government.

PRINCE2 is the current version and was developed in 1996 to encompass any project type. PRINCE2 is based on the PMBOK principles but is more direct in how it applies these principles and it is not as broad or in-depth as PMBOK (Siegelaub, 2004; Warne, 2006).

### 3.3.1 PRINCE2 Components

Siegelaub (2004) identifies the core components of PRINCE2 as:

- Business Case
- Organisation
- Plans
- Controls
- Management of risk
- Quality in a project environment
- Configuration management
- Change control

### 3.3.3 PRINCE2 Process Overview

PRINCE2 consists of the following processes forming part of a single flow, depicted in Figure 3.2 (Siegelaub, 2004; Warne, 2006):

- Starting Up a Project
- Directing a Project
- Initiating a Project
- Planning
- Controlling a Stage
- Managing Product Delivery
- Managing Stage Boundaries
- Closing a Project
Figure 3.2: The PRINCE2 Process Model (Warne 2006; Siegelaub 2004)

a) Starting Up a Project (SU)
This process occurs once during the project lifecycle and is used to set up the Project Board, allocate resources and for planning the Project Initiation Document (PID).

b) Directing a Project (DP)
This process is active throughout the project lifecycle and sits above, and interacts with the other PRINCE2 processes. The Project Board functions
within this process and serves as a decision-making and directing forum for all activities within the project.

c) Initiating a Project (IP)
During this process the PID is defined, which directs how the overall project will be managed. The Business Case is created and the first project stage is planned and documented.

d) Planning (PL)
This process serves as a common thread throughout the project and controls the project through a consistent and coherent approach. Warne (2006) highlights the following activities within this process:

- Identifying the tools and techniques required.
- Identifying recipients of the plan.
- Identifying and describing the products and work packages.
- Producing and costing the schedule.
- Identifying activities required.
- Identifying resources, skills and time.
- Identifying dependencies.
- Allocating resources to activities.
- Creating, modifying and monitoring the plan.

e) Controlling a Stage (CS)
This process is iterative and provides the project manager guidance on how to manage the daily activities of the project. This process includes:

- work authorisation and receipt of work
- issue and change management
- status collection, analysis and reporting
- viability consideration
- corrective action
- escalation of concerns to the Project Board and other resources
f) Managing Product Delivery (PD)
During this process, work is agreed upon, performed and reported on. This process is part of the work authorisation system of PRINCE2, as part of the work packages.


g) Managing Stage Boundaries (SB)
During this process the transition from the current stage to the next stage is managed in accordance with the Business Case. The completion of the current stage is verified, the risks and documentation are updated, lessons learned are documented and the planning for the next stage is performed.

h) Closing a Project (CP)
During this process the project is handed back to the organisation after completion of the work or termination of the project. An overall lesson learned from the evaluation is performed and recorded. Completed work is evaluated against:

- Customer and management satisfaction
- All expected products are handed over and accepted by the Customer
- Support and operation of products is catered for

3.4 SCRUM
SCRUM as a methodology, falls within the Agile stable of methodologies and was developed in the 1990s by Ken Schwaber and Jeff Sutherland. The term SCRUM is not an acronym; instead it is taken from the sport Rugby Union, as the daily meeting central to SCRUM resembles the scrum set phase of the sport.
SCRUM has popularity in the IT industry due to its simplicity, and it has been used with great success by companies such as Google, Yahoo!, CapitalOne and SAP (Sutherland & Schwaber, 2007; Warne, 2006).

The remainder of this section is based on the literature of Sutherland and Schwaber (2007).

### 3.4.1 SCRUM Fundamentals

SCRUM is best described as a methodology that organises and executes work through iterative and incremental processes. Each iteration within SCRUM is referred to as a *sprint*. Each sprint has a fixed duration, referred to as being *timeboxed*, and cannot be extended, irrespective of whether all the work of the sprint is completed or not. Sprints usually have a duration that varies from one to six weeks; but end-to-end, typically four weeks is preferred.

A *product backlog* is created that contains all the required features of the users. SCRUM is also characterised by cross-functional teams, as the traditional testing phase is included in the sprint. The cross-functional team completes these features by choosing from the product backlog features that are allocated and committed to a sprint.

Progress and constraints are monitored and visually displayed on a daily basis during the stand-up meeting. At the end of the sprint, the work is demonstrated and the sprint is reviewed for any lessons learnt.

### 3.4.2 SCRUM roles

The roles within SCRUM are:

- **Product owner.** The product owner determines what the end product with its associated features should be.
- **SCRUM master.** The SCRUM master facilitates the SCRUM process and enables the team to be successful by removing impediments.
• Team members. The team members are responsible for building the product and this product should involve all the skills required to complete the sprint.

3.4.3 SCRUM Processes / Ceremonies

The SCRUM process is depicted below in Figure 3.3:

Figure 3.3: The SCRUM process overview, modified from (Warne 2006; Schwaber & Sutherland 2007)

The processes, also referred to as ceremonies, within SCRUM, as depicted in Figure 3.3, are:

- Initiating SCRUM
- Sprint Planning
- Sprint Execution
• Sprint Review
• Sprint Retrospective

**a) Initiating SCRUM**

The first activity in SCRUM is to create the product backlog. This is created by the product owner through the identification and prioritisation of the product features. The product backlog is created in conjunction with the team to include non-functional features and to determine to what extent the features are specified. There exists a single product backlog throughout the SCRUM and this can be changed and amended at any time by the product owner.

**b) Sprint planning**

During the sprint planning the team and the product owner agree on the goals of the sprint. The team selects features from the product backlog which are committed to the sprint. The product owner does not dictate or control how many features are being committed by the team. The features committed to the sprint are broken down into tasks and form the sprint backlog.

**c) Sprint Execution**

During the sprint the sprint backlog cannot be changed. The team chooses between themselves which sprint task will be performed and by whom it should be done. A daily stand-up meeting of 15 minutes occurs to identify what has been done since the previous meeting, what will be done by the next meeting, as well as any possible obstacles.

Progress is visually recorded to assist with communication and managing delivery. A burn-down chart is produced to indicate how much work is still outstanding.


d) Sprint Review
At the end of the sprint, all work is demonstrated to the product owner, SCRUM master, the team and any interested parties. The aim is to get feedback and show progress.

e) Sprint Retrospective
After the sprint review, the product owner, the SCRUM master and the team review the sprint to identify what worked, what did not work and what needs to be changed for the next sprint. This step can be facilitated by an outsider.

3.5 Conclusion
Traditional project and IS methodology lifecycles start with the gathering of information in the form of a system or list of the business requirements. This process places the desired functionality that the IS needs to meet, as the central and starting point of the project. Dependent on the project and the IS methodology followed, the remainder of the process is based on achieving the goals determined during this step.

The strength of this approach is the logical and controllable sequencing of events, but it is hampered by changing requirements, inaccurate estimates and the possible misinterpretation of specifications.

Agile project methodologies aim to deliver workable results earlier in the process, whilst allowing for changing requirements. In contrast with the traditional project management methodologies, the requirements are not frozen and the focus is placed on the execution of the requirements.

Cohen (2003, cited in Warne 2006) summarises the difference between the traditional Waterfall and the Agile project philosophies in Table 3.1:
Table 3.1

<table>
<thead>
<tr>
<th>Focus</th>
<th>Waterfall</th>
<th>Agile</th>
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<tbody>
<tr>
<td></td>
<td>Documentation, Planning, Governance</td>
<td>Culture, People, Communication</td>
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<td>Roots</td>
<td>Mass Production</td>
<td>Lean Manufacturing</td>
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<tr>
<td>Planning</td>
<td>Up front</td>
<td>Iterative</td>
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<tr>
<td>Teaching</td>
<td>Training</td>
<td>Mentoring</td>
</tr>
<tr>
<td>Dissemination</td>
<td>Documentation</td>
<td>Communication</td>
</tr>
<tr>
<td>Implementation Risk</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Testing</td>
<td>Planned</td>
<td>Constant and automated</td>
</tr>
<tr>
<td>Change</td>
<td>Controlled</td>
<td>Encouraged</td>
</tr>
<tr>
<td>Project Size</td>
<td>Medium, Large</td>
<td>Small, Medium</td>
</tr>
<tr>
<td>Team Size</td>
<td>Medium, Large</td>
<td>Small</td>
</tr>
</tbody>
</table>

Table 3.1: Differences between Waterfall and Agile project philosophies (Cohen 2003, cited in Warne 2006)

The methodologies discussed in Chapter 3 are by no means an exhaustive list, but rather focus on the predominant methodologies in the ICT project management sphere. This chapter serves as the context for the research. Any further exhaustive discussion of ICT project management is beyond the scope of this research.
CHAPTER 4
A SOCIAL RELATIONSHIP AND NETWORK OVERVIEW

4.1 Introduction
Ashworth and Carley (2006) state 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 being increasingly considered as important for achieving more consistent and sustainable success in corporate environments. Corporate organisations are spending increasing amounts on social responsibilities outside their operating environments, as their customers are taking cognisance of these issues and are demanding these efforts.

Inside the organisations, similar efforts are being made to heed the social factors, especially from a human resources point of view. The question exists whether these social factors are being considered within the IT environment that has thusfar been traditionally viewed in a scientific or engineering light.

4.2 Social Networks
In organisational theory, managers are viewed as contributing over and above the skills they have acquired through experience and education, and 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 organisation’s advantage (Gargiulo & Benassi, 2000; Ashworth & Carley, 2006).

Of particular interest to the research is how social networks within IT teams are viewed, instead of focusing on the social networks of the project managers or business managers. The social capital of the individuals participating in the IT teams, has an influencing factor on the social networks that are active within the IT 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 (Monge & Contractor, 2003, cited in Havorka & Larsen, 2006).

Social networks have a key function in the social information processing within an organisation, especially relating to connecting social influence, knowledge and the organisational culture to the actual projects at hand. This influence is depicted in the model below:

Figure 4.1

Figure 4.1 Interaction of network strength and social information processing (Havorka & Larsen, 2006).
Traditional project and IS methodology lifecycles start with the gathering of information in the form of systems or business requirements. This process places the desired functionality that the IS needs to meet as the central and starting point of the project.

Depending on the project and the IS methodology followed, the remainder of the process is based on achieving the goals determined during this step. This research is not aimed at which process or methodology is right or wrong, but rather on the effect of social networks during IS projects. An overview of ICT project management was provided in Chapter 3, for completeness.

However, past studies have placed little focus on these social networks and in the researcher’s view have failed to take cognisance of the importance of social networks.

4.3 Socio-technical constituencies
Collinson (2000) defines the socio-technical constituencies (STC) framework 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, organisational, technical and economic factors are highlighted.

Although the STC of Collinson is based on the innovation process, this model can be extended to IS projects, as IS projects 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 IS project. Collinson (2000) 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 social networks allows one to emphasise the concept of interrelation and interaction between the individual IT teams participating in the IS project. This interaction occurs between the different sets of social constituents of the IT teams involved in the IS project, impacting across a variety of networks, and thus from the basis of the socio-technical constituencies.

The STC model is depicted below.
In IS projects, the use of the socio-technical constituencies 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 networks are the key to completing successful IS projects.

### 4.4 Trust

Trust is an important component in social relationship building, but it remains a complex and ambiguous phenomenon (Kadefors, 2004). Rosseau et al. (1998, cited in Kadefors, 2004) define trust as:

Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another.

This definition implies that trust is not a behaviour but rather a psychological state. Furthermore, Kadefors (2004) 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 IS projects due to the high level of cross-functional members that participate in IS projects and the associated fundamental need for cooperation. Required trust levels are directly affected by the situational circumstances and the team dynamics within IS projects.

Finding the right balance of trust is important, as there are costs associated with trust (Kadefors, 2004):

- 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.

Trust is thus a context-based psychological state that is affected by the participating individuals, as well as the associated circumstances. Lewicki et al. (1998, cited in Kadefors, 2004) explain this:

> 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 IS projects, relational trust is the prime driver of trust development in IS 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 IS project environment.

**4.5 Conclusion**

IS projects are characterised by the creation of cross-functional teams that work together in a particular situational context to achieve the specified project goals. The realities of a team where individuals work together
necessitate the creation of and existence of social relationships and networks within the project structure and environment.

However, these networks and relationships are not only limited to the project environment, as individuals bring their pre-existing relationships and networks as part of their contribution to the team.

The use of the socio-technical constituencies approach enables the identification of the social, economic and technical networks that are active within the project team framework. Understanding these networks can shed light on some of the influencing factors on the success of the project, which cannot be overlooked when following project management methodologies.

The concept of trust is an important factor in building and maintaining relationships due to the high levels of co-operation required in IS projects. A close eye should be kept on this aspect of the social dynamics within the project team.

It is important that project managers and project team members need to recognise that each individual brings more than just their specific expertise and knowledge to the team.
CHAPTER 5
GROUNDED THEORY DATA INTERPRETATION

5.1 Introduction
The data used for the initial GT process was obtained from the project documentation of the two case studies. 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 the two selected case studies.

5.2 Case Studies
The two case studies used for the GT process are based on two different approaches followed by Nedbank Ltd towards IS projects. The first case study refers to the primary centralized approach and the second case study relates to a decentralized approach. The case studies are briefly discussed, the former in more detail due to its larger IS project volumes.

5.2.1 Nedbank Group Technology
The Nedbank Group Technology Programme Office (NBGT) was created by Nedbank Ltd. to provide integrated end-to-end management services for Nedbank’s strategic project portfolio. NBGT makes use of programme management to control the myriad of projects executed concurrently within its environment. NBGT is tasked with the greater strategic project portfolio and serves the group and clusters primarily. The structure of NBGT is depicted in figure 5.1:
Figure 5.1

Figure 5.1 NBGT Structure

a) Approach to Project Management
NBGT based its project management methodology on the PMI PMBOK. All nine knowledge areas are implemented but tailored to the Nedbank environment. The high level process is illustrated in figure 5.2 (with the detail available in Appendix B):

Figure 5.2

Figure 5.2 NBGT High level Project Management Process

b) Programme Office Credo
NBGT developed a credo to drive and coordinate their functions and processes:
- Lead to orchestrate growth.
• Organise to transform ideas into results.
• Anticipate by preparing to win.
• Deliver by achieving beyond expectations.
• Strategise to make the right moves.
• Measure to know where the project stands.

c) NBGT Objectives

NBGT aims to achieve the following objectives:
• Ensuring that the right projects are executed against Group and Cluster Strategies.
• Creating and Ensuring Customer Satisfaction.
• Assisting in the delivery of Projects on time, within budget and with quality deliverables.
• Ensuring international best practice performance standards for Group Technology.
• Ensuring both project resources and project financial constraints are managed appropriately.
• Management of Project Governance.
• Continuous improvement.

d) Project Office Maturity Model

NBGT makes use of a project office maturity model to measure the maturity of their projects and project management function. The model is represented in table 5.1:
Table 5.1

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<thead>
<tr>
<th>Scope Management</th>
<th>Programme Office Defining Value</th>
<th>Programme Office Organised</th>
<th>Searching for Delivery Value</th>
<th>Portfolio Management</th>
<th>Community Built-In</th>
<th>Project Teams Delivering on Schedule</th>
<th>Project Teams Calibrated With Portfolios</th>
<th>Organisation Delivering</th>
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Table 5.1 Project Office Maturity Model used by NBGT
5.2.2 Nedbank Personal Loans Information Technology

Nedbank Personal Loans Information Technology (NBPL IT) is a full fledged IT department that services the needs of the Personal Loans business division within Nedbank. The structure of NBPL IT is depicted in figure 5.3:

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.

a) Approach to Project Management

NBPL IT follows a similar approach to NBGT in terms of project management methodology, however tailored to the needs of NBPL. The high level process is illustrated in figure 5.4:
b) **Organizational Maturity**

The researcher did not perform an in depth organizational maturity analysis towards project management for NBPL IT, but from personal assessment, using table 5.1 as a base, the level of maturity was found to be at the initial levels between Programme Office Defining Value and Programme Office Organised. Projects are usually of short time span (less than 3 months) due to fast changing customer demands.

### 5.3 Grounded Theory Representation

The researcher used the ATLAS.ti software to perform the GT data ordering, data analysis and theory development phases. The initial core categories identified are depicted in figure 5.5 below:

**Figure 5.5 Network View of GT**
The core categories identified are:

- The role of leadership within the project
- The project culture
- The social relationships between team members
- The individual’s external social networks
- External influencing factors on the project

**a) The role of leadership within the project**

The specific concepts that relate to this category are:

- 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 project team

**b) The project culture**

The specific concepts that relate to this category are:

- 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

**c) The social relationships between team members**

The specific concepts that relate to this category are:

- 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

**d) The individual’s external social networks**

The specific concepts that relate to this category are:

- Which type of external social networks are utilised
- What are the external social networks utilized for
e) External influencing factors on the project

The specific concepts that relate to this category are:

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

These core categories were used as basis for the survey design to elicit further information for the GT process. The survey and key findings are discussed in the next section.

5.4 Survey Results

5.4.1 Survey Design

This section discusses the approach used to design the survey used as part of the research.

a) Survey Research

Wellman and Kruger (2001) explain that surveys conduct measurements, at a single point in time, which can be classified into four different groupings:

- Correlation designs
- The criteria-groups design
- Cross-sectional designs
- Longitudinal designs

The survey utilised 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 can be used to make comparisons between subgroups (such as project managers and developers) and evaluate relationships between variables.
b) Population, sample and data collection

The target population for the survey was limited to the two case studies as used for the GT approach. The researcher focussed on project managers, developers and other participants in IS projects. The same survey was used for all participants irrespective of their role within IS projects.

The survey was distributed to 100 possible candidates in the form of a self administered internet questionnaire. The researcher created the survey using an on-line facility called FreeOnlineSurveys. The survey was distributed to the survey sample using a link to the on-line survey via email.

The Likert Scale was used to measure the participants views on the categories identified during the GT initial data collection phase. The Likert Scale allows for interval scales and a full spectrum of statistical analysis however as the research is conducted using an interprevistic approach, no statistical analytical procedures were used during the data analysis phase. The researcher used a deductive interprevist approach to analyse the results of the survey.

c) Survey objectives

The survey served two objectives during the research:

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

5.4.2 Survey Interpretation

This section discusses the interpretation of the survey results. The survey was distributed to 100 IS project participants across the two cases with 58 valid responses received. Not all responses included answers for every question forming part of the survey.
a) Survey Participants
The distribution of the survey respondents is illustrated in figure 5.6:

The majority of the respondents performed the following project roles in the cases:

- Project Manager 25%
- Developer 25%
- Architect 15%
- Business / Systems Analyst 10%
- Tester 10%

The survey respondents represent a good distribution of project team member roles.
b) Use of Consultants / Contractors

Figure 5.7 illustrates the composition of the project teams:

The respondents were asked whether the project team consisted only of team members within their division. Only 28% indicated that the project team solely consisted of team members within their division, indicating that a strong culture of cross functional teams exists within IS projects.

38% of the respondents indicated that external consultants / contractors formed part of the project team. The primary reason for use of external consultants / contractors is depicted in figure 5.8 below:
The primary reason for using external consultants / contractors is the lack of internal resources. External consultants / contractors were used to provide additional capacity as part of the project teams. This indicates that the internal resource levels could not meet the demand from the customers in the two cases.

c) Project Culture

Figure 5.9 illustrate the answers of selected questions relating to project culture:
The results depicted in figure 5.9 indicate the following regarding project culture:

- Projects encapsulate a recognizable culture.
- The divisional cultures within the organization directly influence the culture within the project.
- The culture within the project serves as a driving force that influences the end result of the project.
- External consultants / contractors need to fit into the project culture.
Figure 5.10

![Pie chart showing the distribution of responses to the statement: Project Manager determines the project culture.]

There is an exact 50 / 50 split between whether the respondents view the project manager as the primary determinant of the project culture. This implies that the project manager has a limited influence in determining the project culture; however it is an influence that should not be ignored.

d) Social Relationships and Networks

Figure 5.11 illustrates the type of social relationships that the respondents developed within the project team:
87% percent of the respondents indicated that some level social relationships were developed within the project teams. It is noteworthy that 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. One such aspect is problem solving.
Figure 5.12 indicates that 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.

Figure 5.13 indicates that one in two respondents indicated that they made use of their social networks outside the organisation to gain knowledge so that they could influence the project.
Figure 5.14 indicates that the team members make use of their social relationships to the benefit of the project but to their individual benefit as well.

**e) Leadership within the project**

A number of questions forming part of the survey were aimed at eliciting information regarding the aspect of leadership in the project team. The key findings are depicted in this section.
66% of respondents indicated that leadership did in fact influence the outcome of the project.
74% of respondents indicated that they viewed the role of leadership in the project as more important than strictly following procedures, in achieving a successful project outcome.

f) External Influences on the project
IS projects are not executed in insulated environments and are likely to be influenced by external factors outside the project. The reality of this likelihood is illustrated in figure 5.17 below:

Figure 5.17

The specific causes of the external influence are depicted in figure 5.18:
The respondents indicated the top three causes of external influence in IS projects to be:

1. Arrival of new technologies
2. Changes in market needs
3. New industry standards and patterns

5.5 Conclusion

The main objective of this chapter was to present the key aspects identified from the results of the data collection, data ordering and data analysis phases of the GT. A high level overview of the two case studies, the representation of the GT research and key findings of the supplementary survey was presented.

Chapter 6 is the concluding chapter of this research. This chapter presents the findings of the GT research in detail and illustrates how social
relationships and networks within IS projects should be viewed. A literature comparison is also included to validate the validity of the results from the GT theory. In conclusion some recommendations and future research areas are presented in chapter 6.
CHAPTER 6
CONCLUSIONS, RECOMMENDATIONS AND FUTURE RESEARCH

6.1 Introduction
The conclusions of the research are presented in the final chapter, chapter 6. The research consisted of a grounded theory analysis to assist the researcher to deductively evaluate the importance of social relationships and networks within IS projects. The findings from the research are presented in this chapter, including a literature comparison to validate the results from the research. The research is concluded with recommendations and future research topics.

6.2 Grounded Theory Research Findings
The saturated GT network view is represented in figure 6.1:

![Figure 6.1 Saturated GT network view](image)
6.2.1 Representation of the Grounded Theory Network: Impact Areas of Social Relationships and Networks

a) The role of leadership

Leadership in IS projects has a direct influence on the project outcome as indicated by two thirds of the survey respondents. The GT network of the role of leadership is presented in figure 6.2:

![Figure 6.2 Network View of the Role of Leadership](image)

The leadership role in an IS project is not limited to the function of the project manager; any stakeholder can play this role. Leadership can serve as a positive as well as a negative influence and need to be harnessed to the project’s advantage. 74% of the respondents viewed the role of leadership to be more important than strictly following procedures in an IS project. This implies that the project leadership need to know when to tailor processes to the client needs and when to enforce processes.
Effective leadership will also assist the project team in reacting to change and overcoming stumbling blocks in the project lifecycle. The project leadership must also have the support of the project team. A disconnect between the project leadership and the project team can be very disruptive and put the successful outcome of the project at risk. Cognisance of the social relationships between the project leadership and project team members must be taken, as these relationships can be used to influence the leadership outside of the project structures.

b) The project culture
The project culture within IS projects has a direct influence on the project outcome. The GT network of the project culture category is presented in figure 6.3:

Figure 6.3 Network View of Project Culture
Distinct project cultures can be identified within IS projects. These project cultures can differ from project to project within the same organization, even with the same project teams. The project management philosophy used as base for managing the project directly influences the project culture. An Agile approach where the project team is co-located will have a significantly different project culture versus a Waterfall approach where the project team is located separately within their functional streams. IS project teams are categorised as cross functional teams that contain individuals from different divisions within the organisation, which implies that the divisional cultures influences the project culture. Cognisance of possible divisional cultural clashes needs to be taken when project teams are established.

A third of respondents indicated that project teams contained external consultants / contractors. This implies that these external consultants / contractors will add to the team dynamics and need to fit into the project culture. The project manager has a limited but substantial influence on the project culture. 50% of the respondents indicated that the project manager determined the project culture. The personality, respect from the project team and level of social relationships within the organisation are key attributes of the project manager which influences their ability to determine the project culture. The project culture within the IS project does have significant influence on the outcome of the project and the greater the support of the project team for the dominant project culture, the more likely a positive project outcome will be.

c) The social relationships between project team members
87% of respondents indicated that they developed some level of social relationships within the project team. The GT network of social relationships between team members is represented in figure 6.4:
The nature of IS projects requires some level of team member interaction throughout the project lifecycle 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 extend that team members developed friendships that extended beyond the project environment.
Project team members use their social relationships primarily to solve problems and to gain some level of advantage. Problems can be solved making use of the project structures as well as outside of these structures. The social relationships that are developed can be of use to solve problems making use of informal structures or when the formal project structures become a stumbling block itself. Trust in IS projects are relational and is established over time through execution. The lack of trust between project team members can negatively impact the execution of and dynamics within the project.

\textit{d) The individual's external social networks}

An individual adds more to the project than just their skills and knowledge. Their social networks that exists prior to the IS project are also part of their contribution. The GT network view of the individual's external social networks is depicted in figure 6.5:

Figure 6.5

Figure 6.5 Network View of the individual's external social networks

Project team members make use of social networks outside of the IS project structure primarily to gain information. This information is used to
solve problems and assist the team member to influence the project direction or decisions that fits within the project structures. These social networks can be of a formal nature or informal. Formal networks include industry portals, special interest groups, past colleagues and information feeds, whilst informal networks include blogs, search engines and social networking tools. These lists are for illustrated purposes and are not exhaustive. Individuals can also be used by other members in their social networks to influence the IS 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.

**e) External influencing factors on the project**

The GT network view of the external influencing factors on the project is depicted in figure 6.6:

Figure 6.6

![Figure 6.6 Network View of external factors influencing the project](image-url)
IS projects are not insulated from external factors and when such interference occur, it is usually significant. The dominant external factors that influence IS projects are:

- Arrival of new technologies
- Change in market needs
- New industry standards and patterns
- New government legislation
- Actions by competitors
- Directions from shareholders
- Economic circumstances of customers

Usually the IS project cannot control these factors but taking cognisance of these factors can assist in mitigating the effect of the influence on the project outcome. Adapting to these influences and managing their impacts can significantly reduce the actual impact on the project outcome.

6.2.2 Impact Types of Social Relationships and Networks within IS Projects

Social relationships and networks are active in IS projects in three primary formats:

- Influence
- Friendships
- Advice

a) 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.

b) 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.

c) 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.
6.3 Literature Comparison

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.

Ashworth and Carley (2006) 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 and Carley proposed that the individual’s knowledge and task execution contributes 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 focussed on friendship and advice within their research.

This research does not attempt to validate or reject the research of Ashworth and Carley as the objectives cannot be directly compared. Similarities exist between this research and research of Ashworth and Carley as both gathered data within software development environments and evaluated some aspect of social relationships and networks within teams. This research and the research of Ashworth and Carley can be viewed as complimentary and adding to the literature of social network theory.

6.4 Proposed answers to research questions

This section aims to briefly answer the research questions identified in section 1.4. The proposed answers are high level as the detail has already been discussed as part of this research.
6.4.1 Primary Research Question
This research proposes that social relationships and networks within corporate information systems projects do impact the outcome of the projects. Specifically social relationships and networks impact the projects in the following manner:

- Individuals influencing other team members
- Individuals developing different levels of relationships and friendships with team members
- Individuals obtaining advice from other team members

Social relationships and networks of individual impact IS projects in the following areas:

- The role of leadership
- The project culture
- The social relationships between project team members
- The individual’s use of external social networks
- External influencing factors on the project

6.4.2 Secondary Research Questions

a) How are social networks used?
Internal social relationships and networks are used for problem solving to the advantage of the project as well as to the advantage of the individual. External social networks are used by the individuals primarily obtain information so that the individual can influence certain aspects of the project, be it direction or decisions. Other members of the social network can manipulate the individual to influence the IS project as well.

b) Do separate and distinct social networks develop within project teams?
Distinct project cultures, social relationships and networks do develop within project teams. The team composition as well as the project structures has direct influence on the levels of these developments. These relationships and networks do not develop equally between all project team
members and are not static. These social relationships and networks can vary between projects between the same team members over time.

c) **Do pre-existing social relationships and networks between potential team members influence the dynamics of a new project team?**
Pre-existing social relationships and networks can influence the dynamics of new project teams. Trust is developed or reduced between project team members based on performance over time. The level of trust that exists as part of the social relationships and networks will significantly impact the dynamics of new project teams.

d) **What factors outside the project team have an influence on the social relationships and networks?**
The primary external factors influencing IS projects are:

- Arrival of new technologies
- Change in market needs
- New industry standards and patterns
- New government legislation
- Actions by competitors
- Directions from shareholders
- Economic circumstances of customers

e) **Does the use of external consultants / contractors influence the social relationships and networks within a project team?**
The use of external consultants / contractors can influence the social relationships and networks within the project teams. The view of the research is that the team as a whole is more important than individuals and thus external consultants / contractors need to adapt and align with the social relationships and networks within the project structures. Only in exceptional circumstances where the project cannot continue without the specific individual, will the project team adapt and adjust to the individual.
6.5 Future Research
This research contributes to the growing body of literature on information systems project management as well as social network theory. The key impact areas of social relationships and networks within IS projects are presented in this chapter. Based on this research, the following future research areas can be investigated:

- Traditional project management theory focuses on project management philosophies and methodologies. The impact areas identified in this research can be mapped against the dominant project management philosophies and methodologies to determine their specific considerations.
- Expanding the research to other corporate environments as well as non corporate environments to allow for generalization of the findings.
- The development of practical management guidelines and maturity models for IS projects to effectively harness and manage the social relationships and networks active in IS projects.

6.6 Conclusion
The Standish Group CHAOS report of 2004 (SoftwareMag.com, 2004) classify only 34% of IS projects as successful, despite a growing emphasis and attention on project management philosophies and methodologies. Sauer (1993) and Standing (1998) recognised that IS projects are largely a social and political process, prompting the question as to whether these social and political aspects need to be considered in IS projects.

The objective of this research is to determine whether social relationships and networks need to be considered as part of the management of IS projects. A grounded theory research was conducted to identify the initial core categories of impact areas of social relationships and networks within IS projects. The grounded theory process is a time consuming method and
the researcher experienced initial difficulties during the identification of the core categories as part of the data analysis phase. These core categories were used to create a Lickert survey to obtain additional information to further develop and saturate these categories. The results from these activities were interpreted by the researcher using the interpretivist research paradigm. The conclusions of research identifies impact areas and impact types of social relationships and networks on IS projects.

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 IS projects 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 IS projects. These impact areas and types need to be considered when project teams are established as well as monitored throughout the project lifecycle. Taking cognisance of importance of social relationships and networks within IS projects can improve the management of technology and ultimately to greater success rates of IS projects, so doing improve the faith and track record of IS projects.
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