
**An enquiry into the temporal coordination of
Groupware Calendar Systems (GCS):
conceptualizing the private and public perspectives**

A Thesis Submitted for the Degree of Doctor of Philosophy

by

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ABSTRACT

Groupware Calendar Systems (GCS), asynchronous on-line meeting schedulers are designed to fulfil the increased need for coordination of work, by supporting time management of temporally and geographically dispersed individuals and groups.

From a study of the literature on GCS adoption, a premise was constructed that temporal coordination of GCS requires a marriage of conflicting private and public perspectives. This is based on the fact that firstly, the system has to support both individual and group work, and secondly, generally considered 'private' information has to be publicized by individuals. However, there is a lack of understanding of the dynamism of these perspectives especially in relation to the process of temporal coordination in GCS. The aim of this thesis is to understand and conceptualize temporal coordination of GCS.

The research strategy of this thesis adopts a 'grounded approach' together with a 'progressive research approach' to investigate the GCS phenomenon. The actions and processes of GCS-in-use are examined using the case study method. The research design progressively refines and reflects upon the findings in two stages: stage-one, two pilot studies and stage-two, two case studies. A selection of data collection techniques were used in order to obtain a rich data set via semi-structured in-depth interviews, observations, questionnaires, documentation and photographs. The analysis employed a pattern-matching technique and the 'SCOT' framework, modified to examine the process of temporal coordination and the dynamic relationships produced in GCS which led to the construction of a new conceptual model. This model of 'reflective temporal equilibrium' presents the state of temporal coordination, formed by the phenomenon of continuous conflict between the private and public perspectives.

The outcomes of this thesis provide a clearer theoretical picture of GCS, consequently leading to implications for its future design and adoption for better coordination and collaboration of work.

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LIST OF PUBLICATIONS

This thesis contains the following material that has been published as a direct result of this research.

Published papers

Park S. and Lee H. (2002): Temporal autonomy as a requirement of Groupware Calendar Systems (GCS) UKAIS 2002 10-12th April 2002, Leeds Metropolitan University, UK.

Harris, H. and Park S. (2002) Groupware Calendar Systems (GCS) modeling in virtual environment: Using Role Activity Diagram (RAD), Proceedings of the IADIS International Conference WWW/Internet 2002, ICWI 2002, Lisbon, Portugal, November, 13-15, 2002.

Park, S., Harris, H. and Crosbie P. (2003) Requirements for groupware calendar systems (GCS): Addressing social relationships. Proceedings of the IADIS International Conference WWW/Internet 2003, ICWI 2003, Algarve, Portugal, November 5-8, 2003.

CHAPTER 1

Overview

1.1 Introduction

This thesis examines Groupware Calendar Systems (GCS) which is defined as a *'collection of on-line calendars that can be shared across networks'* (Palen, 1998), asynchronous on-line meeting schedulers. These are designed to support the coordination of time and space in a virtual environment in order to facilitate improvements in work efficiency, specifically streamlining the process of scheduling. A premise was constructed from a study of the literature on GCS adoption that GCS requires a marriage of conflicting private and public perspectives in order to enable temporal coordination. This is underpinned by the fact that firstly, the system has to support both individual and group work, and secondly, generally considered 'private' information has to be publicised by individuals. The lack of understanding and the conceptualization of the premise has prompted an investigation into the nature and the process of temporal coordination of GCS. The research is based on three broad questions, aiming to provide a better understanding of the GCS phenomenon: 'How do people utilise GCS in organizations?', 'How is the temporal coordination process of GCS enacted?', and finally, 'How is the process of temporal coordination of GCS sustained?'

This chapter introduces firstly, the context of the problem that helps understand and locate the research question and secondly, the aim, objectives and the contributions of this thesis. Finally, it presents an outline of the following six chapters with an outline diagram.

1.2 Context of the problem: the changing working environment

The interdependent relationship between globalization on the one hand and information and communication technology (ICT) on the other has been regarded as the main driving force behind the emergence of new ways of working, which can be

characterised as virtual work and the networked organization. As information and knowledge replace tangible commodities, organizations are becoming disconnected and fragmented while the work becomes abstract (Zuboff and Maxmin, 2002) unlike traditional organizations which are characterised as rigid and inflexible (Mintzberg, 1983). These new form of organizations are embracing immediate interactivity and increasingly rely upon communication interaction between individuals, groups and organizations all of which take place over the web in a virtual environment. Organizations are utilizing virtual positions to respond to the increasing dynamic complexity in business to obtain competitive advantage (Lipnack and Stamps, 1997). This has led to an increase in the need for coordination of time and space for effective work (Jarvenpaa and Leidner, 1999; Saunders, 2000).

People work in groups, as members of teams, as individuals with associations, as managers, as subordinates, etc. and such collaborative working requires temporal coordination (McGrath and Kelly, 1986) as time is considered to be a critical factor in groups (McGrath, 1990). The individual and organizational need for temporal coordination is not new but the issue becomes more apparent as the reorganization of work is taking place in the interconnected world. IT is providing the technology driven transformation of communications by enabling new ways of processing and delivering work across time and space and consequently facilitating the changes in organizational designs and processes (Jackson, 1999). These changes are accompanied by a transformation of working practice (Orlikowski, 1996; Brown and Duguid, 2001; Wittel, 2001) which leads to a transformation of communication, collaboration and coordination activities (Zuboff, 1982; McGrath, 1990; Orlikowski, 1996; Barrett and Walsham, 1999). The introduction of new technologies means that social roles may change, hierarchies may become more or less salient, business processes become modified, and communication broadens choices among different media and tasks (Orlikowski and Iacono, 2001).

This emerging phenomenon has been facilitated by groupware technologies, enabling people to redefine the ways in which we undertake work. Groupware technologies, such as email, video conferencing, instant messaging and Groupware Calendar System (GCS) are increasingly mediating human interactions and communication. The objective of groupware is to facilitate groups to communicate, collaborate and

coordinate their activities in a shared environment for teamwork (McGrath, 1990). In order to achieve the effective utilization of groupware, 'people's cognitions or mental models about technology and their work, and the structural properties of the organization such as policies, norms, and reward systems' (Orlikowski, 1992) have to be taken into account. Successful adoption is therefore based on the combination of technology, culture, economics and politics of the organization (Coleman, 1997). The implication of this is that groupware usage has to be examined in the organizational context.

The changing working patterns, increasing globalization and the need for different forms of flexible coordination of work processes, together with the increased usage and adoption of groupware in organizations have provided the rationale for studying the process of temporal coordination of GCS. The next section introduces the aim and the objectives of this thesis.

1.3 Aim and objectives

The aim of this thesis is to understand and conceptualize temporal coordination of GCS which is underpinned by conflicting private and public perspectives. Consequently, the research focuses on the examination of the nature of temporal coordination and how the process is being undertaken. The aim of the thesis breaks down into the following three broad research questions such that each question acts as a guide to each stage of this study. These three broad research questions are presented below and these will be explained with the following objectives.

- How do people utilise GCS in organizations?
 - A case study method is used to examine the actions and processes of GCS-in-use employing multi data collection techniques to obtain an in-depth understanding of the phenomenon.
- How is the temporal coordination process of GCS enacted?

- Collected data is analysed using a modified SCOT (M-SCOT) framework to identify social issues which are then categorized into the GCS functional characteristics and attributes. These are compared and contrasted with that of the literature using a pattern-matching technique.
- The interrelationship between the GCS attributes are illustrated and explained to examine the process of temporal coordination.
- How is the process of temporal coordination of GCS sustained?
 - The attributes of GCS-in-use are examined further focusing on the roles that they play in the dynamic process of temporal coordination.

1.4 Research methods

The research strategy of this thesis adopts a ‘grounded approach’ together with a ‘progressive research approach’ to investigate the GCS phenomenon. Using a case study, the research examines the actions and processes of GCS-in-use. The research design progressively refines and reflects upon the findings from two stages: stage-one, two pilot studies and stage-two, two case studies. The ‘grounded approach’ enables the subject matter to emerge from the data, and the ‘progressive research approach’ critically assesses these emergent issues in a continuous comparison with the preceding stage and with the GCS literature.

A selection of data collection techniques were used in order to obtain a rich data set via semi-structured in-depth interviews, observations, questionnaires, documentation and photographs. Collected data was analysed using the modified SCOT framework (M-SCOT) and a pattern-matching technique in order to uncover and examine the dynamic relationships involved in the process of temporal coordination in GCS.

1.5 Contributions

This research has five contributions in terms of future theoretical and practical work on GCS which are described below.

- Classification of the GCS literature into two groups: GCS attributes and functional characteristics. This will support future theoretical work and practical design of GCS.
- Introduction of the modified SCOT (M-SCOT) framework as an analytical technique which was adapted from Pinch and Bijker. The operationalization of the M-SCOT framework was demonstrated successfully in identifying and examining social and design issues of GCS-in-use.
- Formulation of three distinct GCS calendar relationships and uncovering their intertwined characteristics in their operationalization: ‘Individual Calendar Relationship (ICR), ‘Central Calendar Relationship’ (CCR) and ‘Collaborative Calendar Relationship’ (CoCR). This recognition of the various perspectives within GCS enables a clearer theoretical picture of GCS which helps shape and inform its future design.
- Development of a GCS temporal coordination model, revealing the dynamic relationship between the GCS attributes involved and the underlying private and public perspectives. The implication of this will help in the adoption process to bring about a successful implementation strategy of GCS in organizations.
- Development of a ‘reflective temporal equilibrium model’ to demonstrate the state of temporal coordination. The implication is for future implementation strategies of GCS.

1.6 Thesis outline

In this section, an outline of each chapter is presented below with a diagrammatic outline of the thesis.

Chapter 2 Literature at work: exploring the phenomenon of GCS

This chapter collates and critically examines the research literature on GCS. The aim of this chapter is to contextualise and problematise GCS which leads to the construction of a premise. Beginning with a discussion of the calendar as a social artefact, which helps to contextualise GCS, the chapter then discusses the specific GCS literature from which the research question was firmly established. The remainder of this chapter organises and presents the literature in classification frameworks, categorizing it into two main perspectives: functional characteristics and the GCS attributes. This chapter concludes with a relational diagram of GCS adoption based on the identified GCS attributes.

Chapter 3 Research design: building a research framework

The aim of this chapter is to outline and justify the research perspective, method and the data collection and analytical techniques used in this thesis. It presents a diagrammatic process of the research and analysis. The qualitative research approach underscores the case study method using the interviews as a primary data collection tool, supplemented by observations, questionnaires, documentation and photographs. The collected data was analysed using the M-SCOT framework and a pattern-matching technique. This chapter pays particular attention to the original SCOT framework to explain its theoretical background, modification and appropriateness in capturing emergent social and design issues of GCS.

Chapter 4 Pilot Study: proceeding with the research framework

This chapter reports on the findings from two pilot studies. The pilot study is to gain an overview of GCS usage and investigate the GCS attributes from the literature further. The main discussion issue of this chapter is the emerged three interrelated calendar relationships in GCS. This chapter explains the characteristics of these three calendar relationships which lead to a confirmation of the premise of Chapter 2 that temporal coordination of GCS is underpinned by conflicting private and public perspectives.

Chapter 5 Case studies: the process of temporal coordination

Chapter 5 presents findings from two case studies of socially embedded GCS, demonstrating the operationalization of the M-SCOT framework. The findings are compared and contrasted with the work of the previous chapter and the literature, using a pattern matching technique in order to enrich and validate the findings. The focus of this chapter is to examine the interrelationship between the attributes of GCS. This leads to a development of a GCS temporal coordination model, underpinned by the conflicting private and public perspectives. This promotes further questioning of the realization of the state of temporal coordination in GCS. This forms the context of the next chapter.

Chapter 6 The GCS phenomenon: the state of reflective temporal equilibrium

The aim of this chapter is to discuss the private and public concepts from the trust and temporal control perspectives in order to understand the dynamism of the state of temporal coordination in GCS. The model of a reflective temporal equilibrium is introduced which is based on the phenomenon of continual conflict and negotiation between private and public perspectives.

Chapter 7 The IS implications and discussion

The final chapter provides a summary of the thesis with the discussion on the research process. Five contributions listed in Chapter 1 are examined further and the implications on the thesis for future IS design and research are discussed.

Appendices

Appendix A Data preparation

It presents examples of a full transcription and a sentence summary of one of the interview data sets in order to validate the data preparation technique in support of the discussion in Chapter 3.

Appendix B Pilot study questionnaire and interview questions

The questionnaire and the semi-structured interview questions used in Chapter 4 are presented. The interview questions are divided into four types in order to cater for different objectives.

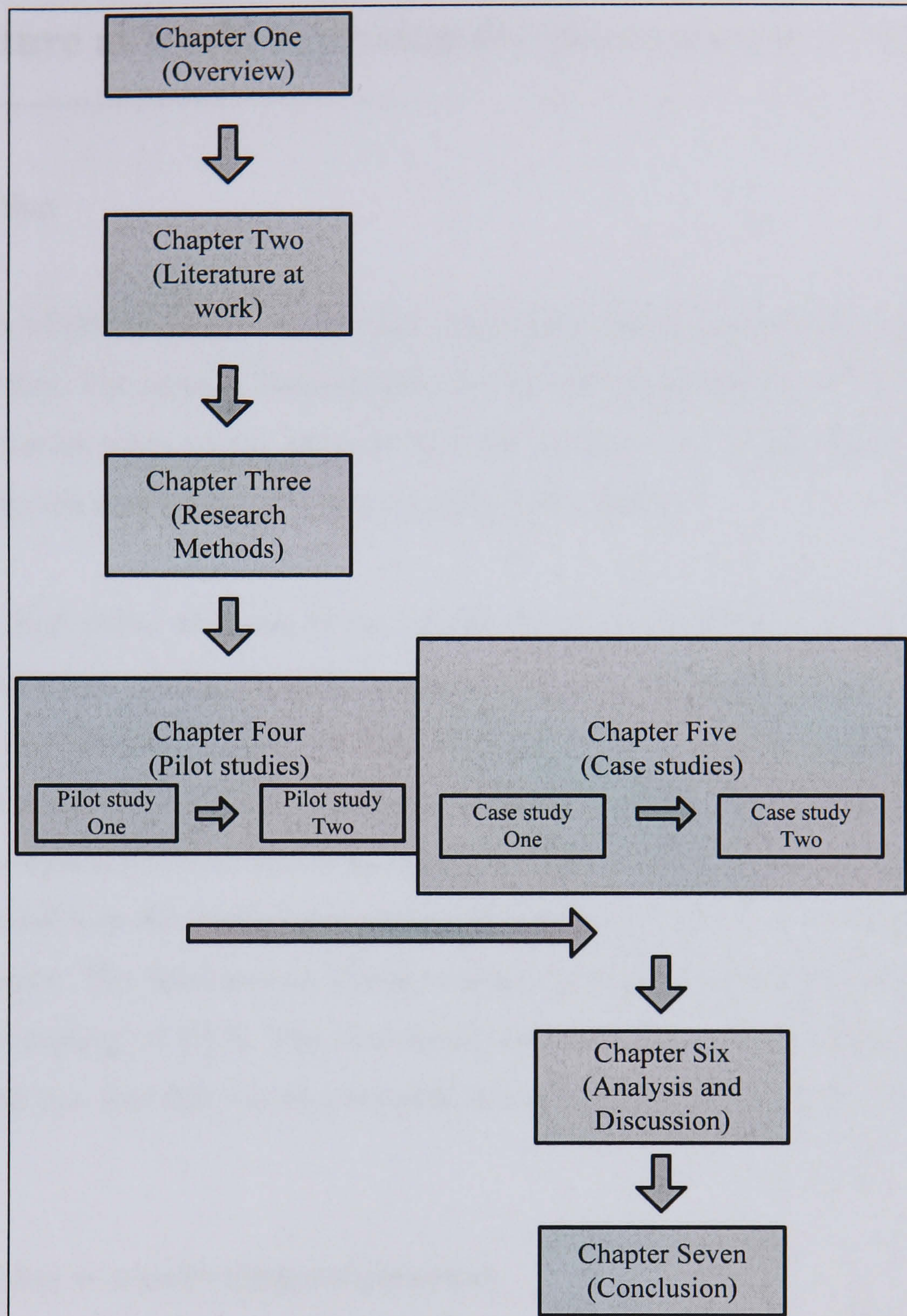
- Pilot study - stage one follow-up interview questions
- Pilot study - stage two interview questions for GCS users
- Pilot study - stage two additional interview questions for managers and secretaries
- Pilot study - stage two interview questions for non GCS users

Appendix C Case study data analysis

The case study interview questions and questionnaire are presented followed by a complete set of M-SCOT framework analysis and a table of functional characteristics of GCS used in the discussion in Chapter 5.

The illustration below (DIAGRAM 1.1) is a diagrammatical representation of the workings of the thesis.

DIAGRAM 1.1
Thesis outline



1.7 Summary

The aim of this chapter was to provide an overall picture of this thesis. It began by locating the context of the research question and the issues that contribute to the research question. It then presented the aim of this research and objectives to show how the aim could be achieved. Five contributions were described which were followed by a diagrammatic outline of the thesis. The next chapter discusses the calendar as a social artefact, focusing on the GCS literature.

CHAPTER 2

Literature at work: exploring the phenomenon of GCS

2.1 Introduction

The main aim of this chapter is to provide a literature background which frames the research question. The enquiry focuses upon the current understanding of GCS which leads to the construction of the premise that the temporal coordination of GCS is underpinned by the conflicting private and public perspectives.

This chapter first looks at some of the characteristics of calendars which help to define the boundary of the research question. Having established the contextual boundary of the calendar, the next section focuses on the role of the calendar in the organizational environment where temporal regularity is a key dimension. It briefly looks at the temporal coordination as an emerging issue in IS. This leads to questions on the role of GCS in the changing working environment, locating the context of the research question. The final section of this chapter provides an in-depth study on the current understanding of GCS. The functional characteristics and attributes of GCS are categorized in a way that can be compared and contrasted later with the case study data.

2.2 The calendar as a socio-temporal structure

The calendar not only refers to various artefacts but also imbues different meanings for its users. On the one hand, a calendar refers to an artefact with a primary role of representing intentional projected activities in future dates and months, or a personal archive, representing a completion of the hours, minutes of time past. On the other hand, it is a mere representation of date, month and year, an invisible temporal structure that governs our daily lives. The calendar in this thesis refers not only to the artefact itself but also the context of the calendar, in that there is an interconnectedness of the relationship between the calendar and the users. This is

achieved through the on-going social processes between them, making a socio-temporal structure.

The calendar is a man-made temporal system that dissects hours, days and years into a pre-arranged socially agreed order. It is an artificial temporal boundary that has been created to help us understand our daily existence through a temporal structure which regulates and punctualises our activities (Mukerjee, 1990). It is socially constructed and yet has been accepted as a law of nature since our lives have been evolving within a temporal system stemming from the very beginning.

‘Our life is socially organized and temporally structured’ (Zerubavel, 1981) that activities are designed and performed within a given temporal structure. For example, if we talk about having a meeting on the 21st of March 2006, we would know the temporal point in our lives that we are talking about. We know how many months it is from this point and also that it is after the New Year. It might also trigger that it is probably about time that our sister is having a baby and the cold winter is almost over. By the same token, if we talk about a meeting held a year ago, we could place ourselves in time and place with other related social and political events but probably need some help from the recorded notes. The calendar orientates us in time and place by drawing the boundary of the relationships that exist in that particular time and place.

This section begins with a brief history of calendar, highlighting the calendar attributes such as scheduling and timetabling. It then goes onto examine the role of the calendar, focusing on its dialectical relationship with its users and the emerging issue of temporal coordination in organizations; thus establishing the context of the research question.

2.2.1 A brief history of calendar

Over 20,000 years ago, ice age hunters used sticks or bones to scratch the wall to count days. There are numerous pre-historical examples of using some form of the calendar. Calendaring activity has been part of our lives however primitive the life was. The first calendar, based on these usages, was the Egyptian calendar and later

developed into Julian calendar used by the Romans, which spread into Western Europe and lasted for more than 1,500 years. However, it was the Gregorian calendar of the 16th century, a modification of the Julian calendar, which became universally accepted. This offered an improved system of regulative seasons, marked by the religious festivals which were set against the phases of the Moon and seasonal activities that were determined by the movement of the Sun. The calendar was important not only for the scholars who studied chronology but also for people who needed to measure periods for agriculture and to conduct religious and commercial activities. The aspects of its practicality and the functionality are the characteristics of the calendar that time management has tried to maximise and adapt.

The calendar and the schedule are one of the longest established institutions, invented to establish and maintain temporal regularity (Zerubavel, 1981). The underpinning of the concept of the schedule has its roots in the practice of religion stretching back over two thousand years, used to systematize the Jewish daily scheduled religious services. Later the medieval Benedictine period was when the concept of temporal regularity informs the very principles of modern Western understanding of time and scheduling (Zerubavel, 1981). The invention of the schedule has consolidated the element of routine in our daily life (Zerubavel, 1981). It crystallizes the activities with regard to when the task should start and finish, which in turn gives the deadlines for the activities. Our daily activities are shaped and regulated by the notion of deadline, a triumphant control over nature. Mumford (cited by Zerubavel, 1981) traced the organizations' 'orderly punctual life' in the West to this period which took shape in the monasteries, where punctuality meant one's manifestation of ascetic obedience to God. A monk's life was disciplined and structured by a rigid temporal regularity and these temporal patterns are accounted for by the schedule.

The schedule is based on a social convention rather than our biological needs that in Benedictine's table of hours, even biological patterns became regulated. It is this conventionality, the most significant characteristic of the schedule, generates the socio-temporal order in society (Zerubavel, 1981). There are explicit rules and laws in every society, for example, 'the shops have to be closed at this time' and '15 hours a week constitutes a full-time study' etc. The schedule is the enactment of the temporal

structure, the calendar. The calendar and the schedule are the products of the social convention.

The brief discussion above has led to two broad characteristics of temporal structures. Firstly, we create a temporal structure that we systematise ourselves into. It is rigid and organizational and non-negotiable, such as a timetable. Zerubavel defines timetable as ‘...consisting of a set of blocks of time within which events are durationally fixed, sequentially ordered, and located between absolute points in time’ (Zerubavel, 1976). Secondly, there is a temporal structure that is flexible and personal, delineated by the personal individual activities. An individual can negotiate with others and does not necessarily have a fixed point in time like a timetable. These two aspects are intertwined in the actions and the example could be ‘I am going to go shopping in the afternoon’. It is my intention to go shopping in the afternoon, not in the morning. However the fact is ‘I’ am restricted by the opening hours of the stores that ‘in the afternoon’ cannot be ‘anytime’ in the afternoon. It is predefined afternoon, probably before 5pm, depending on which day of the week and which shop. As long as it is before the closing time, I can go shopping at any time. Through the scheduling activity based on these two broad characteristics of temporal structures, our actions are temporally coordinated for example, ‘I am going to go shopping this afternoon before the shop close at 5pm so I can prepare a dinner for a group of friends who would be arriving at 6pm from the offices where they leave at 5pm’. Temporal coordination is an on-going social processes achieved through constant negotiation between these two characteristics of temporal structure.

2.2.2 Calendar and organization

Since the transition from an agricultural way of life and working in a land where the understanding of time was governed by light length of the day and seasonal changes to a modern industrial society, regulating and managing time became a primary concern for any business. This is regarded as gaining competitive advantage for a business organization and monitoring the usage became a main business strategy (Stalk and Hout, 1990). Benjamin Franklin’s famous saying in 1748 to a young tradesman, ‘remember that time is money’ has been deeply embedded in the business

environment. As time became a valuable business resource, the calendar is perceived as a vital tool for conducting business (Kelley and Chapanis, 1982).

Socio-temporal order is manifested in a form of the calendar in organizations. The calendar is an essential cornerstone tool which fulfils an important role in assisting with carrying out daily routines, meeting deadlines, and conducting business affairs in general. It facilitates and regulates our daily functions and helps to organise future activities to meet the requirement of an effective and efficient business process, with which to gauge and measure to the management of deadlines and other time constraints. It also supports daily decision-making as a means of prioritising events that may occur at the same time, in other words, it supports daily structuring and restructuring of organizational temporality. However the underlying issue is the predicament of temporal coordination for an effective business practice.

The 1936 Charlie Chaplin film 'Modern Time' presented a satire of the clock as a symbol of industrialization and mechanised work. The invention of the 20th century, time management, based on maximisation of the usage of the available time and Taylorism, 'the principles of scientific management' perfected a scientific approach to 'controlling' the movement of assembly line production by bringing about a desired temporal order over the seemingly chaotic wasteful nature, keeping up with the notion 'time is money'. These are the ideas, deeply embedded in our daily lives that time is scarce and consumable and as a result, it has to be managed and controlled from a systematic approach. It has left the modern consciousness in a belief that we can never have enough time, fixed by the hours of clock time.

The term time management was coined by Alec Mackenzie in the early 1960s (Sabelis, 2001). Covey (1999) identified four generations of time management. The first generation is associated with notes and checklists and this was followed by the second generation which is characterised by calendars and appointment books. The first and second generations of time management offered to tackle time scarcity by planning things ahead, focusing on managing, scheduling and organising time. The third generation aimed at prioritization and setting goals. Its main activities are setting goals for future activities and evaluating and placing them in the order of importance. The perspective upon these three generations is that time management is needed. A

management approach is a requirement to plan, schedule and control work through the assignment of time. The fourth generation turned the concept around and proclaimed that instead of managing time, the focus has to be on 'how we make use of time', managing the time user. This change from a mechanical approach to a context based approach towards time, transformed the perception of time. However, the problem remains that time still equals money and this means that usage of time needs to be scrutinized as the business organizations continue to look for a way to improve efficiency in their use of time. This time management issue continues to prevalent in a virtual working environment.

As discussed in section 1.2, as a consequence to the changes in work and in working relationships, new individual and organizational perceptions about the use of time has formed. The implications of these changes have been the source of inspiration for increasing research in IS and business (Davenport and Pearlson, 1998; DeSanctis and Monge, 1999; Kling, 2000; Markus et al., 2000). The focus has been on improving coordination and collaboration of work across time and space (Büsher et al., 1999; Depickere, 1999; Furst et al., 1999; Jackson, 1999) in order for efficient communication and business processes. Orlikowski and Yates (2002) recognized that time had emerged as a focus of attention in recent organizational studies. However, Lee and Liebenau (2002) argued that temporal implications of these technological driven organizational changes are little known yet. Orlikowski and Yates (2002) argued that time is the outcome of an enacted phenomenon and that temporal structure is produced and reproduced. They suggest that 'temporal structuring' emerges from, and is embedded in the varied and ongoing social practices of people. In everyday action, actors produce and reproduce a variety of temporal structures and that such temporal structures powerfully shape those practices in turn. For them, the study of temporal structure of the organization offers an insight into organizational work and working relationships. This is built upon the earlier work of Barley (1988) which identified ICT as a driver of changes in temporality. Hassard (1997) argued that temporal structure is at the heart of organization. It is the enactment of the processes of temporal coordination taking place through the interaction between individuals and groups.

2.2.3 Temporal coordination in IS

Temporal coordination is inherent in and prerequisite to any coordination activity whether it is mediated by technology or not. The steady increase in the study of coordination and temporal coordination in IS has been recognized by authors such as Malone and Crowston (1994) and Im et al. (2005). The focus of these temporal coordination studies may vary as discussed below. However, the common aim is that there is a need to understand firstly, the relationships between technology and temporal coordination and secondly, the working of technology in supporting both synchronous and asynchronous work.

Synchronous work is characterised by work that needs to be carried out at the same time; termed 'temporal symmetry' (Zerubavel, 1981). Asynchronous work on the other hand is characterised by work that does not require simultaneity and can be carried out as separate activity which is termed 'temporal complementarity' (Zerubavel, 1981). Zerubavel (1981) explained that 'temporal symmetry' and 'temporal complementarity' are the patterns of temporal coordination through which we form relationships with one another and structure our temporalities. For virtual work, temporal coordination faces an additional challenge as technology has to support firstly, both patterns of temporal coordination of interdependent work, secondly, not only co-located work but also work that is geographically dispersed across different time zones.

There are broadly two streams of temporal coordination literature work in IS firstly, studying the role of technology in supporting temporal coordination of work (Barley 1988; Egger and Wagner, 1992; Bardram, 2000; Lee and Liebenau 2000) and secondly, uncovering the emergence of temporal coordination through the study of technology (Im et al., 2005). Study of temporal coordination in this thesis differs from the previous works in two aspects firstly, it looks at the technology that is specifically designed for everyday temporal coordination and therefore it is not bounded by the characteristics of a particular project or specialised work but it examines daily temporal coordination activity and secondly, this thesis examines the working of temporal coordination of GCS based on the assumptions, built upon the literature study that GCS is a temporal coordination tool and in fact it supports temporal

coordination. The research interest is on the intrinsic mechanism of GCS which enables temporal coordination. The next section explains GCS and its technological evolution.

2.3 GCS, pushing the boundaries of calendar

Idiosyncrasy has characterised the calendar as an object of private property that its role is highly dependent upon the individual user's perception and usage. However, this has changed in part due to the introduction of GCS, which has emerged as one of the earliest applications in computer supported cooperative work (Palen, 1998). Ehrlich (1987b) explained that 'these systems allow groups of people to simultaneously access the same information and take advantage of the time structure of the relationship between activities'.

GCS have been described as in 'steady proliferation' (Palen, 1999) with an increase in importance in emerging forms of organizations (Lee, 2003). GCS are designed to support group work and increase collaboration and coordination of work. By having personal calendars on-line, for instance, a meeting could be organized almost automatically as opposed to numerous phone calls and e-mails to each one of invitees, since GCS will be able to locate a suitable time that all the invitees are available. This may seem trivial for a meeting between two people but in the context of a large organization where meetings between large numbers of workers are common place, its importance is potentially significant. Additionally, GCS provides a capability to find and arrange meetings with a geographically and temporally dispersed workforce. GCS are designed and aimed to be a solution to time management. Some of the commonly found claims for GCS products are; it 'can dramatically enhance the productivity of workgroups throughout your entire organization' (CyberScheduler) and 'whether you're an organization of 10 or 10,000, scheduling meetings with your peers has never been easier' (Meeting maker).

The design approach adopted by GCS has been to enable the user to place restrictions upon the access and view provided to other users of his/her own calendar. There are various degrees of access provided by GCS and the user can determine the level of information flow. Open GCS systems allow people to see what an individual is doing

and when, whereas restricted GCS only shows whether the individual is free or busy. These two types of calendar viewing functions, open or restricted, determine the degree of action and interaction and in turn, it suggests different social implications.

This change in the role of calendar, moving from being a private artefact to a public has enormous social and organizational implications. Interestingly, this shift has been seen not only as the changes in the ways in which the calendar is used, but also the changes in its nature from forming an exclusive relationship with its user to becoming a medium of human interaction in a virtual environment, serving multiple users through the publication of one's calendar in a public domain. This leads to the question of the boundary between private and public as these two conflicting concepts are intertwined, crossing each others domains. GCS therefore can be seen as bridging software between the private and the public domains.

Hooff (2004) distinguished GCS usage (he used the term 'electronic calendaring and scheduling' (ECS)) into 'individual use' and 'collective use' based on the work by Lee (2003). These dimensions of GCS have been raised by Palen (1998, 1999) and further explored in the works of Lee (2003) and Hooff (2004). These distinctions of GCS usage highlight the functions of groupware and its adoption challenge that it has to support the individual as well as group work. Hooff's work is tabularised below (TABLE 2.1).

TABLE 2.1
GCS usage and activities

GCS usage (Hooff, 2004)	Characteristic	Activities
'Individual use'	Individual time management	<ul style="list-style-type: none"> • Temporal orientation • Scheduling activities and meetings • Registering information for retrieval, reconstruction, and reminding
'Collective use'	Interpersonal coordination	<ul style="list-style-type: none"> • Coordinating meetings • Looking for people and finding out where to reach them • Synchronizing activities • Booking facilities

However, this is a functional perspective of GCS. In order to have a better understanding of GCS, it is required to have a view that encompasses its social implications of for example, having to open up one's calendar information to others

which was previously largely considered to be private. These social aspects of GCS have to be problematized and investigated further. The function based perspectives, ‘individual’ and ‘collective’ are not sufficient to conceptualise GCS and consequently, the concepts of private and public are employed here.

The distinction of private and public concepts in sociology has been closely linked to the separation of home and employment especially through the discussion of the division of labour (Jaggar, 1988). This thesis has adopted the implications of the characteristics of these concepts, a continual process of conflict and negotiation. The word private is associated with vocabularies such as, ‘withdrawer’, ‘seclusion’, ‘independence’, ‘intimacy’, Williams (1988) explained that it is such characteristics and connotations that contrast with the concept of public and make these two concepts interact continuously. These concepts are also highly relevant in the research on virtual environment as the boundary between home and employment is becoming blurred. These concepts help to construct a premise that there are two conflicting perspectives at work within GCS. This section discusses various terminologies referring to GCS, provided by different authors and then gives a brief historical development before examining its characteristics further.

2.3.1 Establishing terminology

Researchers have used various terms to describe GCS. On the one hand, a broad term has been used to describe GCS, as opposed to paper calendars, as ‘electronic calendars’ (Ehrlich, 1987a; 1987b) and ‘electronic diaries’ (Mackinlay et al., 1994; Brown and Crawshaw, 1998). Electronic calendars and diaries could mean any calendar running on battery or electricity. Too broad a term, it does not explain the characteristics of GCS. On the other hand, some researchers have highlighted a meeting scheduling function of GCS and used the terms such as ‘automatic scheduler’ (Kincaid et al., 1985), ‘meeting scheduler’ (Sugihara et al., 1989; Kozierok and Maes, 1993; Ephrati et al., 1994), ‘distributed meeting scheduler’ (Sen and Durfee 1991, Sen et al., 1997; Payne, 2002) and ‘calendar scheduling system’ (Blandford and Green, 2001). By focusing on meeting scheduling functions only, the diversified usages of GCS could be overlooked. In other words, these terms do not explain adequately or capture the communicative, collaborative and cooperative nature of GCS. Then there

are such terms as ‘electronic calendaring and scheduling’ (van den Hooff, 2004) conjoining the above two aspects but still do not capture all the characteristics and implications of GCS-in-use. The usage of these generic terms can be explained as an attempt to encompass various growing mobile devices with calendar application with an increase in interconnectivity and interoperability.

However, the interest of this thesis is not in making a distinction or inclusion of technologies based on their technical specification. This would inevitably lead to using a word such as ‘electronic’ in order to cover desktop GCS as well as PDA or mobile phones with a function of calendar synchronization. This thesis is rather interested in making a distinction or inclusion of the technologies based on their usage. Thus, the term, Groupware Calendar System (GCS) by Palen (1998) which encompasses all the attributes of the above terminologies is used to include any technological artefacts that are used for the purpose of GCS described in section 2.3.

2.3.2 Evolving GCS

According to Palen (1998), GCS were the first groupware applications that appeared in the mid to late 1970s, to support personal and group time management. Since then their significance, role and usage have changed considerably, encompassing a component part of integrated office automation suites to Web-based and wireless supported software. These evolving characteristics of GCS are organised into three developmental stages (TABLE 2.2) under the terms, ‘coupled’, ‘decoupled’ and ‘pervasive’, which adapted and extended the work of Palen (1998).

The first generation, the ‘coupled’ stage indicates that GCS were perceived as one of the components of software. The ‘decoupled’ stage indicates their separation from monolithic Office Automation (OA) systems. It was primarily to support personal time management but beginning to address the need for group calendar coordination. There were stand alone GCS software products but GCS was characterised as part of the applications of groupware product. In recent years, the design and development has witnessed the growth of the wide spread usage of web-based GCS and function to synchronize with mobile devices. This tertiary mature ‘pervasive’ stage of GCS

extends the concept of coordination into a new dimension where temporality and spatiality transcend a fixed physical location.

TABLE 2.2
Evolving GCS

Generations	Notes	Examples of applications
Coupled GCS (mid 70s - early 80s)	Calendar software for personal and group time management	
	Calendar software as 'OA' systems (email, data processing distributed support, limited-way teleconferencing)	Axxa Corporation's System 90, IBM's System/34 series (which preceded PROFS in 1982 and later known as OfficeVision(OV)), Wang's Alliance office system, the Xerox 8010 Star,
Decoupled GCS (mid 80s – early 90s)	Detached from 'OA' systems. GCS support personal time management, group calendar coordination and automatic meeting scheduling. 'Calendaring & Scheduling' (C & S) products emerged.	Lotus (1987), Outlook
Pervasive GCS (from 1996-)	Web-based GCS	Yahoo, MSN, Teamspace, Intranet Suite, Meeting maker
	Wireless supported GCS and increase in use of wireless technologies (Mobile phone, PDA).	iNotes, CyberScheduler, Intranet Suite

The next section provides the classification frameworks of the functional characteristics and the attributes of GCS-in-use issues (refers to thereafter as GCS attributes) in order to help understand the characteristics of GCS.

2.4 Functional characteristics and GCS attributes

The ubiquitousness of calendar and calendar computer applications has led to a taken for granted implicit understanding of it and also a lack of research into its social and design issues. The following sections examine the current literature of both streams which are highly interrelated. For example, the privacy issue has been recognized as having direct design implications (Ehrlich, 1987a) as the need of preserving personal privacy while supporting group work is one of the main social implications of GCS. This has presented designers with the tasks of improving the functions to address the issue. However, this section places emphasis on the social stream as the research interest here is the implemented design usage.

This section is broken down into three sub sections: functional characteristics, GCS attributes and GCS design issues. Functional characteristics focus on the actions that GCS perform and are also perceived to perform. Both the social and design issues of GCS look at the issues of GCS in-use. This classification framework serves three purposes: firstly, it helps to present the current literature in a systematic way, secondly, it provides an understanding of the literature work of GCS and finally, these classification frameworks are used to examine the findings of the case studies as part of the investigation of the process of temporal coordination.

2.4.1 Functional characteristics of GCS

As the private calendar migrates into the domain of the public, it provides a variety of new additional functions that support group work. In organizations, it has functioned as a conduit of social interaction as ‘distributed information systems’ (Palen, 1998, 1999). Researchers have pointed out that there are various unanticipated and unexpected consequences when implementing GCS as they functionalise and automate social processes.

GCS are characterised as ‘supporting temporal coordination by communicating employee availability, enabling people to plan their interactions with others and reduce dependence on chance interactions’ (Palen, 1999). Palen (1998) explains that apart from supporting meeting scheduling, in other words, the temporal coordination for a group of people, they also support a temporal coordination in a wider general sense, in that GCS support the temporal locality of individuals. GCS are known to increase coordination and collaboration of group work by supporting real time and other time-relevant activities (Knudsen and Wellington, 1997; Palen, 1998, 1999). GCS also coordinate people and their work by acting as a repository of organizational memory (Palen, 1999; Blandford and Green, 2001) and by placing the events and people in time on the one hand, and by supporting the exchange of information on the other, for instance; giving information on who is where (Mosier and Tammaro, 1997; Palen, 1999; Blandford and Green, 2001; Mynatt and Tullio, 2001) and their availability (Mosier and Tammaro, 1997; Brown and Crawshaw, 1998; Palen 1998, 1999; Mynatt and Tullio, 2001; Tullio et al., 2002). It has been noted that GCS also

coordinate and synchronize remote workers (Mosier and Tamaro, 1997; Palen 1999).

The function of scheduling meeting is one of the most prominent features in GCS. However, the functions of supporting personal calendaring (Payne, 1993; Mitchell et al., 1994; Mosier and Tamaro, 1997; Palen, 1998, 1999; Blandford and Green, 2001; Mynatt and Tullio, 2001; Tullio et al., 2002; Lee, 2003) and group communication (Ehrlich, 1987a; Lange, 1993; Palen, 1998, 1999) are seen as equally important.

The classification framework table below (TABLE 2.3) was developed from the literature analysis. GCS were categorised into five functional characteristics: ‘supporting meeting arrangement’, ‘supporting communication’, ‘supporting personal calendaring’, ‘supporting work coordination’ and ‘supporting distributing calendar information’. These functional characteristics are closely related to each other and are not exclusive to one another. The functions in the second column are not necessarily generic as the literature includes various designs of GCS however each characteristic is broad enough to cater for such design details.

TABLE 2.3

Classification framework of the GCS functional characteristics

Functional Characteristics	GCS Functions	References
Supporting Meeting Arrangement	<ul style="list-style-type: none"> • Easier and significantly faster • Eliminates telephone tag or email tag • Easier to arrange a conference room • Easy to change meetings 	Sugihara, 1989; Beard et al., 1990; Lange, 1993; Knudsen and Wellington 1997; Mosier and Tamaro, 1997; Brown and Crawshaw, 1998; Palen, 1998, 1999; Mynatt and Tullio, 2001; Tullio et al., 2002; Lee, 2003; van den Hooff, 2004
	<ul style="list-style-type: none"> • Figures out the best time slot for a meeting 	Pino and Mora, 1998; Blandford and Green, 2001
Supporting Communication	<ul style="list-style-type: none"> • Supports communication 	Palen, 1998, 1999
	<ul style="list-style-type: none"> • Helps coworkers who are attempting to ‘drop in’ 	Mynatt and Tullio, 2001; Tullio et al., 2002

	<ul style="list-style-type: none"> Primarily for managers and executives with personal secretaries who maintain the calendars and other group members for locating or planning 	Grudin, 1988
	<ul style="list-style-type: none"> Asynchronous communications about meetings and schedules 	Lange, 1993
Supporting Personal Calendaring	<ul style="list-style-type: none"> Maintains her/his own calendar 	Mosier and Tammaro, 1997; Palen 1998, 1999; Tullio et al., 2002
	<ul style="list-style-type: none"> Reminding 	Mosier and Tammaro, 1997; Brown and Crawshaw, 1998; Mynatt and Tullio, 2001
	<ul style="list-style-type: none"> Temporal orientation Could be used as a record of when they met people, using the search facilities to look back and find the exact dates of previous meetings 	Brown and Crawshaw, 1998 Mynatt and Tullio, 2001;
	<ul style="list-style-type: none"> Allows one to keep track of tasks outstanding with an electronic 'to-do' list 	Brown and Crawshaw, 1998
Supporting Work Coordination	<ul style="list-style-type: none"> Allows synchronization for people who work from home For out of office workers, it makes it easier to respond quickly to queued meeting invitations, and to respond without coming to the office 	Mosier and Tammaro 1997; Palen, 1999
	<ul style="list-style-type: none"> It can be accessed by different people and from multiple locations 	Blandford and Green, 2001
	<ul style="list-style-type: none"> Supports synchronous, real-time coordination as well as other time-relevant, but asynchronous, collaboration processes 	Knudsen and Wellington, 1997
	<ul style="list-style-type: none"> Able to coordinate the diary between manager and secretary Less chance of double bookings 	Brown and Crawshaw 1998
Supporting Distributing Calendar Information	<ul style="list-style-type: none"> Easily share contextualized information publicly over the computer network 	Palen, 1999
	<ul style="list-style-type: none"> Allows others to make useful inferences about one's schedule 	Mosier and Tammaro, 1997; Palen, 1999

<ul style="list-style-type: none"> • Locating someone • PAs can locate where their manager is expected to be each day, so that they can remind them and provide any necessary paperwork, and arrange meetings • Let others know where they are for health and safety regulations • Curiosity-driven reference, e.g. consult the diary when one hasn't seen a colleague for a while 	<p>Ehrlich, 1987b; Mosier and Tammaro 1997; Brown and Crawshaw, 1998; Palen, 1999; Blandford and Green, 2001</p>
<ul style="list-style-type: none"> • Assessing availability • Keeps track of who is in or out of the office • Knows who will be in or out of the office at some time in the future 	<p>Mosier and Tammaro, 1997; Brown and Crawshaw, 1998; Palen, 1999; van den Hooff, 2004</p>
<ul style="list-style-type: none"> • Meeting verification 	<p>Palen, 1999</p>
<ul style="list-style-type: none"> • Organizational learning • A record of meetings 	<p>Brown and Crawshaw, 1998; Palen, 1999; Blandford and Green, 2001</p>
<ul style="list-style-type: none"> • Gives probability of attendance 	<p>Mynatt and Tullio, 2001; Tullio, 2002 (based on their software 'Ambush')</p>
<ul style="list-style-type: none"> • Shows priority 	<p>Beard et al., 1990 (based on their software , 'Visual Scheduler' and try to add context to the system)</p>
<ul style="list-style-type: none"> • Shows the scheduling preference 	<p>Ephrati et al., 1994; Pino and Mora 1998 (Try to add context to the system)</p>
<ul style="list-style-type: none"> • Information resource e.g. looking at someone else's diary to get the details of a meeting 	<p>Lange, 1993; Blandford and Green, 2001</p>
<ul style="list-style-type: none"> • Inform a user's choice of an appropriate communication medium 	<p>Tullio et al., 2002</p>
<ul style="list-style-type: none"> • User can assess the importance of a particular event, either in terms of general interest or in the attendance of specific individuals 	<p>Tullio et al., 2002</p>

The classification of functional characteristics helps the understanding of the GCS attributes which will be discussed in the next sub section. For example, the functional characteristic of GCS of 'supporting meeting arrangement' is associated with an efficient way of working as it appears to reduce scheduling related administration work. However, it has been also noted that last minute rescheduling is not well supported (Mosier and Tammaro, 1997). It also does not support scheduling a meeting with a manager whose calendar is busy and in such case social negotiation

has been identified as a necessity (Brown and Crawshaw, 1998). Another example where a function of GCS is determined by the context is the 'supporting communication' functional characteristic. Availability of information helps to locate the person and plan the meeting. However, it has to be noted that free time in the calendar does not necessarily mean free especially for the managers (Grudin, 1988). This inequality of time value in practice negates the principle functional characteristic of GCS. As discussed above, the implications of these five identified functional characteristics are the interest of this research as discussed below.

2.4.2 GCS attributes

GCS are used in complex social context that involves multifaceted social and psychological factors which need to be assessed (Ehrlich, 1987a). GCS are expected to deal with the unexpected social phenomenon that requires social conventions, shared norms and values. The GCS literature acknowledges that relying on GCS entirely is not appropriate due to the dynamic business environment which deals with unexpected situations (Ehrlich, 1987a). This adds a complexity to GCS which is inherently built upon a challenge to the conventional understanding of the calendar relationships. Palen (1998) explained that, 'on-line calendars still need to support personal work, but must simultaneously support social collaboration'. For Palen (1988), the successful adoption of GCS is heavily dependent upon this dual characteristic of GCS. For GCS to work, personal information is needed to be placed in the public domain for the benefit of improving the efficiency of the group work. GCS have to be able to accommodate these two distinctive domains, private and public.

To achieve a collaboration of work using GCS, our personal calendaring habits and preferences need to be compromised and make some aspects of calendars publicly available (Payne, 1993; Mosier and Tammaro, 1997; Palen 1998, 1999; Blandford and Green, 2001; Mynatt and Tullio, 2001; Tullio et al., 2002; Lee, 2003). Ehrlich (1987a) argued that adapting new computer communication systems requires changes in behaviour and social conventions. People need to compromise their temporal preference in order to accommodate that of the organization.

As a consequence, the adoption of GCS is particularly challenging for organizations due to two main interrelated reasons. Firstly, groupware is designed to support personal as well as group work. For that the users have to feel and realize the benefit in order for groupware to gain a critical mass of users. Secondly, the individuals have to, as discussed above, compromise and alter their work process by adapting GCS into their daily working practice and at the same time, meet a new social demand that they must be willing to share their calendar information with others. These two aspects of GCS led to a construction of a premise that there are conflicting private and public concepts within GCS.

The GCS literature was categorized into social issues by concatenating it through literature analysis, these concepts were then developed into a classification framework with seven GCS attributes. The emerged attributes were; 'deployment', 'training', 'gaining a critical mass of users', 'privacy', 'trust', 'temporal control' and 'workaround' (see TABLE 2.4).

TABLE 2.4
Classification framework of GCS attributes

GCS attributes	Characteristics	Social Issues
Deployment	Top down	<ul style="list-style-type: none"> The application might be made to work through persuading or ordering employees to maintain calendars, and replacing people who won't (Grudin, 1988)
	Bottom up	<ul style="list-style-type: none"> Peer pressure without managerial mandate (Grudin and Palen, 1995)
	Top down & bottom up	<ul style="list-style-type: none"> Peer pressure will encourage people to use diaries, so long as managers support electronic diary use (Brown and Crawshaw, 1998)
Training	Software training	<ul style="list-style-type: none"> Very good training and support increase use of a GCS (Mosier and Tammara, 1997; Brown and Crawshaw, 1998)
	Usage (social) training	<ul style="list-style-type: none"> Provide training so as to teach the correct 'conventions of diary use' (Brown and Crawshaw, 1998)
Gaining a critical mass of users		<ul style="list-style-type: none"> Everyone has to maintain their calendar on-line (Ehrlich, 1987b; Grudin, 1988; Blandford and Green, 2001) Need to re-examine the notion of 'critical mass'. It still is useful only if implemented into a group or department. (Brown and Crawshaw, 1998)

	Benefit driven usage	<ul style="list-style-type: none"> • More individuals will maintain their calendars on-line if the perceived collective benefit were higher (Ehrlich, 1987a) • GCS demand understanding of the benefit (Blandford and Green, 2001) • Disparity between who does the work V who benefits (managers) (Grudin, 1988; Mosier and Tammaro, 1997)
	Group work and individual needs	<ul style="list-style-type: none"> • Tension between the requirement on people to make aspects of their diaries publicly available to support group work and individuals' need. (Payne; 1993; Mosier and Tammaro, 1997; Palen, 1998, 1999; Blandford and Green, 2001; Mynatt and Tullio, 2001; Tullio et al., 2002; Lee, 2003)
Privacy		<ul style="list-style-type: none"> • Need to resolve issues about privacy. (Palen, 1998 and 1999; Pino and Mora, 1998) • Even though privacy issue was not addressed, using semantic web agents to schedule meeting can be used to address this reason for web-based calendar (Payne et al., 2002) • Users must possess knowledge of how their calendars are accessed by others to effectively manage privacy settings. – show the trails of history left by the group (Tullio et al., 2002)
Trust		<ul style="list-style-type: none"> • GCS demand a high measures of trust, mutual respect (Blandford and Green, 2001) • Showing the probability of a particular coworker's attendance might be a problem but a person's habits that are likely to be noticed by organizers or other attendees (Mynatt and Tullio, 2001) • Opening up for peer judgement about his/her time allocation and preferences. (Palen, 1998, 1999; Lee, 2003)
Temporal Control	Dynamic temporal control	<ul style="list-style-type: none"> • GCS affects perception of time and a sense of control (Palen, 1998, 1999; Pino and Mora, 1998; Blandford and Green, 2001; Lee, 2003) • Increase sense of control over their time management by revealing information selectively and by making decisions just-in-time. (Blandford and Green, 1998) • Be willing to let the computer schedule their free time more often than not (Grudin, 1988) • Using software agent to schedule meetings on the user's behalf (Sen and Durfee, 1991; Kozierok and Maes, 1992)
	Default setting	<ul style="list-style-type: none"> • The need for control over who has access to scheduling information (Ehrlich, 1987a) • Deployment defaults setting has to be carefully monitored as it can cause problems of confidentiality, if it allowed full access. (Ehrlich, 1987b) • The defaults reflect some reasonable expectation about how individuals might wish to control access to their calendars (Greif and Sarin, 1987)
Workaround	Office politics	<ul style="list-style-type: none"> • Showing priority for quick and reliable scheduling but users often rated priority of an event too high by considering others who view their calendar. (Beard et al., 1990) • Could cause friction between coworkers as one might not be happy to see coworker's low attendance for his/her meeting or event (Mynatt and Tullio, 2001)

	Increasing personal temporal control	<ul style="list-style-type: none"> • Create a fictitious appointment to block a time slot in their calendar (Palen, 1998, 1999, Blandford and Green, 2001; Lee 2003)
	A lack of reliability	<ul style="list-style-type: none"> • People felt that they could not interpret and assess others' availability (Kincaid et al., 1985)
	A lack of contextual	<ul style="list-style-type: none"> • Free time is never really free (Ehrlich, 1987a; Grudin, 1988; Blandford and Green, 2001)

2.4.3 Design issues of GCS

There have been studies to improve interfaces and the functioning of GCS in order to address some aspects of the identified social implications, such as trust and privacy specifically, through the improvement of GCS' synchronization and coordination functions. Some of the examples are a priority indicator (Beard et al., 1990), calculating the probability of attendance (Mynatt and Tullio, 2001), introduction of intelligent agents (Sen and Durfee, 1991; Glezer, 2003; Faulring and Myers, 2005) and expressionistic latitude model (Pino and Mora, 1998). The brief discussion on some of the design attempts in this section highlights firstly, the direct relationship between the social and design issues of GCS and secondly, the challenges that the designers are facing due to the inherent social implications of GCS.

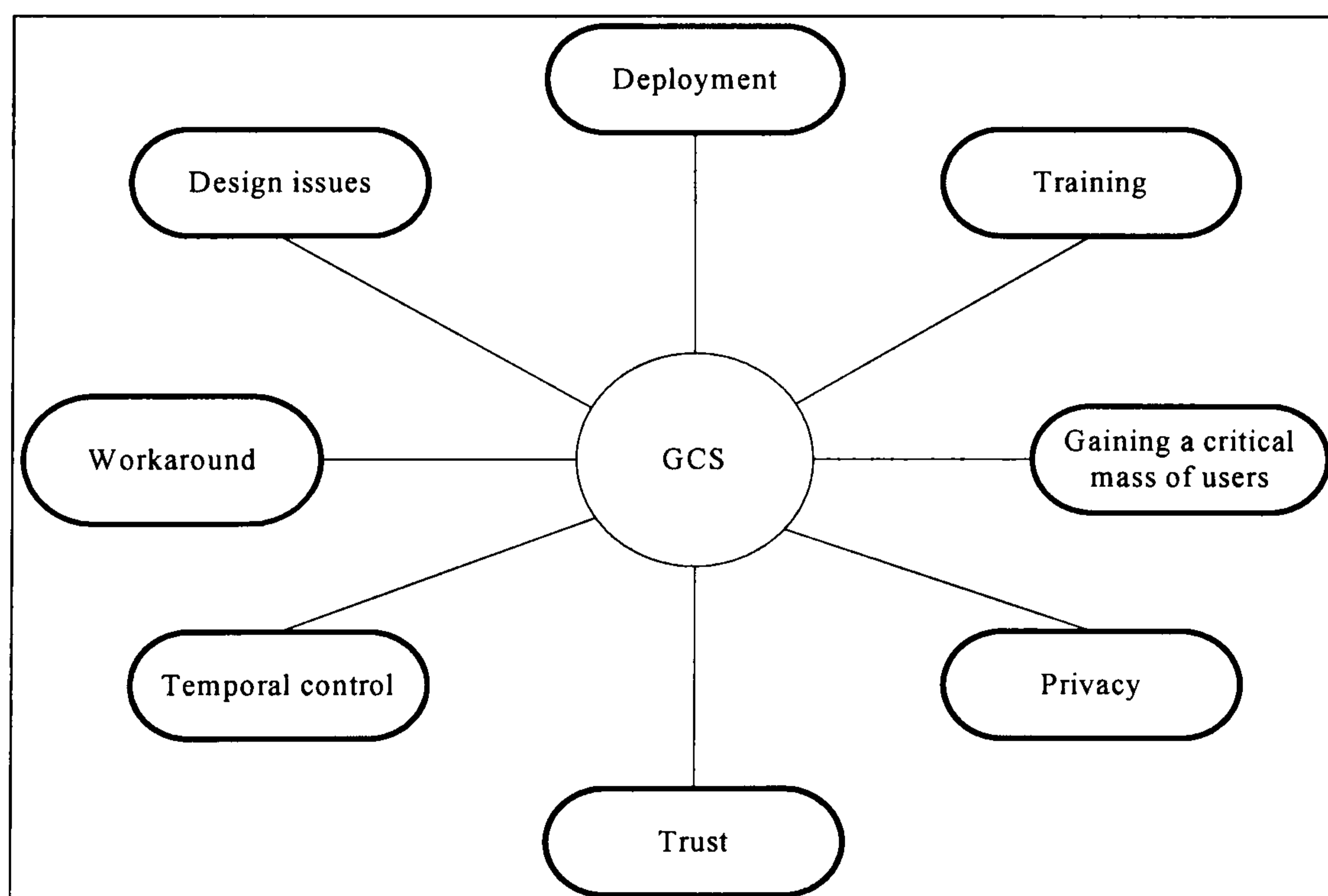
Beard et al., (1990) attempted to tackle the problem of a lack of contextuality. With their design, 'Visual Calendar', the user was able to give priority to the events in a calendar by differentiating the level of transparency. Despite their design success in a controlled environment, it encountered other problems. Firstly, there was ambiguity in the meaning of 'priority' as it could mean on one hand, the importance of an event itself or on the other hand, difficulty in rescheduling the event. Secondly, it was found that some people were rating the priority of the event too high as the person who requested the meeting can view their calendars and a low rating can cause a problem in their working relationship.

Mynatt and Tullio (2001) designed a system called, 'Ambush' to address the problems such as priority setting and locating people's whereabouts. They realised that the calendar does not necessarily provide an accurate picture of one's daily activity. 'Ambush' predicted the 'likelihood' of attendance through the evaluation of the user's attendance history and attribute of calendar events. Its aim was to provide

the calendar viewers with much more accurate information on the probability of the attendance. However, they pointed out that by predicting ‘likelihood’ of attendance it could cause friction between co-workers. No one wants to see their meeting requests to be regarded as less important. These attempts only further highlighted the implication of making what was regarded as implicit and private to oneself to be public.

The seven attributes of the social issues and the design issues of GCS emerged from the literature study are drawn into a diagram below (see DIAGRAM 2.1) to highlight the relationship between the attributes for GCS adoption. The GCS literature has provided comprehensive issues so that the attributes could be formed. However, the relationship between the attributes and how the interrelation contributes to a temporal coordination are not clear. The specific interest that this research concentrates upon is the formation of temporal coordination of GCS, therefore what is required is to examine the dynamism of the interrelationships of these attributes.

DIAGRAM 2.1
GCS adoption



2.5 Summary

The aim of this chapter was to introduce the domain of the research question and its contextual boundary through the discussion of the role of the calendar and the study

of the current understanding of GCS. The calendar represents a socio-temporal structure established through socially negotiated scheduling activity. There has been an increase in interest in calendar usage over the years heightened by the advent of the concept of time management. The development of GCS exemplifies the continuous attempts to manage and control the usage of time. However, the review of the GCS literature draws attention to the concepts of private and public inherent to GCS, the uneasy relationship that needs to be resolved within, to be able to support effective use of time. These conflicting concepts led to a premise for this research that *the underlying phenomenon of the temporal coordination of GCS is based on conflict of the private and public perspectives and their domains are being challenged in order to achieve a critical mass of users*. The next step was to categorize the literature into the functional characteristics and the GCS attributes in order to understand the nature of GCS. However, the classification frameworks found that what was lacking was the understanding of the interrelationship between the GCS attributes which contributes to the realization of the temporal coordination of GCS. Thus, the next chapter provides a research design and framework to explain the ways in which this thesis went about the study of the process of temporal coordination.

CHAPTER 3

Research design: building a research framework

3.1 Introduction

The literature review in Chapter 2 led to a construction of the premise that conflicting concepts exist within GCS and that these need to be investigated in order to understand the nature of the temporal coordination of GCS. Chapter 2 also illustrated the range of GCS issues and their attributes and marked out boundaries of the context of the enquiry. This literature groundwork helped to identify the method and techniques in which GCS-in-use could be examined. The purpose of this chapter is to establish how to capture GCS attributes and examine the relationships between them.

This chapter discusses firstly, the research perspective, followed by a discussion of the theory of the Social Construction of Technology (SCOT) secondly, the suitability of the case study method for studying the calendar-in-use then, thirdly, the data collection and analysis techniques. This chapter concludes with the research and analysis framework that sums up the process of the research.

3.2 Examining GCS-in-use: qualitative approach

Studying a social phenomenon is concerned with themes such as ‘change’, ‘dynamic’, ‘transformation’ and ‘evolution’. The requirement for any research methods is that they should be able to reflect the evolving nature of the social system. There may be norms and rules that contribute to the creation of social patterns through the repetition of the actions across time and space (Giddens, 1993). However, these so-called expected behaviours are subject to constant change as the even intended actions bear unintended consequences (Giddens, 1993). Therefore, the approach taken here is to undertake a holistic view of the processes involved, in order to capture a high level of richness of the social phenomenon using the case study method (Zmud et al., 1989).

The qualitative research approach has been traditionally seen as in opposition to positivism. However, qualitative research has embraced the positivism or deductivist

approaches (Lee and Liebenau, 1997) and has taken some aspects from both for methodological diversity in an attempt to provide a richer understanding of the social phenomenon. It is therefore, inaccurate to view quantitative and qualitative research as polar opposites (Silverman, 1998; Myers and Avison, 2002). As a result, the data sources of qualitative research can be wide, including interviews, observation, questionnaires, documents and texts and the researcher's impressions and reactions in order to enrich the understanding of social and cultural phenomena in context (Myers and Avison, 2002).

The assumption that forms the research perspective in this thesis is that technology is a 'socially constructed culture' (Pinch and Bijker, 1984), a part of a web of interconnected relationships (Kling, 1982), facilitating transformation of people's lives and reaching further into society as a whole. This position differs from a determinist perspective in that social interaction is taken as an on-going process of making and re-making of actions and relationships. It has been argued that technology should be treated as a 'body of knowledge' and at the same time, as a 'social system' (Layton, 1977). This acknowledges that technology has to be treated as a part of the on-going social processes and also a part of the wider set of social relationships. It therefore requires an understanding of the context in which technology is situated (Suchman, 1987).

At the initial stage of this research, two rather overlapping approaches: actor-network theory (ANT) and the Social Construction of Technology (SCOT) were considered. ANT seemed applicable as social, economic and technical factors are seen to form networks while these factors are constituted and shaped within the networks. ANT assumes that 'actors pursue interests, and that these interests can become inscribed in technical or social arrangements' (Klein and Myers, 1999). Both ANT and SCOT view technology as socially-constructed, however, ANT is based on 'the principle of symmetry (technical = non-technical)' (Monteiro, 2004) which means that both technical and non-technical factors constitute heterogeneous entities in a network of 'aligned interest' (Walsham, 1997). This 'principle of symmetry' has been one of the most discussed concepts in ANT and Walsham (1997) explained Callon and Latour's response that the difference between technical and non-technical are understood but

needed to be treated as part of hybrid networks rather than consider them in a relationship of hierarchy. This means that the focus of ANT is on these heterogeneous entities and their linkages.

This research shares the view of co-construction between social and technological factors. However, the distinction has to be made between human and technology since technology is the outcome of the human activity. This is not to deny that there is an influence of technology on the human interaction which in turn shapes the development of technology however, if technology is to be socially constructed as ANT believes, then the hierarchy is already established as a priori to any discussion on technology. In addition, Latour (2004) argued that ANT is about ‘how to study things’ and does not explain positively what the link is.

The research interest of this thesis is to investigate the process and the sustainability of the temporal coordination of GCS, placing human actors at the centre of the investigation. Therefore, SCOT was seen appropriate firstly, as it provides a way to examine ‘how meanings around a technology arise and are sustained’ (Orlikowski, 1992). Secondly, SCOT also provides an analytical framework which could be readily applied to the study of the development of technology and also could easily be modified to apply it to the study of development (process) of technology-in-use.

In this thesis, it is particularly important to capture the views of the ‘relevant social groups’ (RSG) (this is explained in the following section) and the interplay between these ‘RSGs’ and technology to investigate the GCS mediated nature of dynamic working relationships. The view taken in this thesis is that GCS is a social artefact that the meaning of the technology is constructed through GCS mediated interaction between the ‘RSGs’. The next section explains the research perspective, ‘Social Construction of Technology’ (SCOT) which provided the analysis framework.

3.3 Social Construction of Technology (SCOT)

Social Construction of Technology (SCOT) according to Pinch and Bijker (1984) is a research perspective that has provided concepts such as ‘interpretive flexibility’ (even

though it was originally developed in ‘sociological scientific knowledge’) and ‘the technological frame’. These concepts are widely adopted but SCOT as a research perspective has been seldom used and discussed in IS. It is in contrast to the social science domain where SCOT has continued to establish itself as a research perspective.

SCOT’s philosophical foundation is loosely based upon the principles of evolutionary epistemology (Pinch and Bijker, 1984, 1999). SCOT takes a view of the world that people are in a continuum of an evolving social system. SCOT draws upon the social constructivist viewpoint that science and technology are socially constructed but SCOT’s specific interest is in the study of the sociology and history of technology. In this, SCOT has been used to study the development of technology in relation to and in interaction with the ‘Relevant Social Groups (RSGs)’, capturing the influence of these ‘RSGs’ on technological development.

SCOT focused on recognizing the role of actors of the ‘RSG’ in the construction of technology and meanings of technology in the 1980s and 1990s which was in contrast to the dominant view of the users as passive agents (Oudshoorn and Pinch, 2003). One of the well-known empirical studies, using the SCOT perspective was Bijker’s study of the development of the Bicycle, Bakelite and fluorescent lighting (Bijker, 1995), using historical sources. He argued that technology is socially constructed and proposed a theory of sociotechnological change that technology and society are in a co-constructional relationship and also that it is not only the social group of engineers but also the ‘RSGs’ that contribute to the construction of technology (Bijker, 1995). In his study of the history of the development of the bicycle, for example, he suggested that the bicycle reinforced the existing gender structure and also the gender structure influenced the design of the bicycle, the technology.

This earlier SCOT approach has mainly focused on the development phase of technology. It showed how the different user groups perceive technology differently and construct different meanings through social interaction within ‘RSGs’ (Bijker, 1995). ‘RSG’ is an important concept of SCOT and it is not a synonym of a ‘user group’, a group of people who are bounded by the usage. In SCOT, the concept of ‘RSG’ is to ‘get away from such narrow definitions of who and what are relevant in

the development of technology' (Bijker and Pinch, 2001). In the example of the development of the bicycle, the very fact that women did 'not' use a certain design of bicycle even though they wanted to, had significant influence on the development of the bicycle. The concept of 'RSG' therefore forms a key dimension of the construction of meaning of technology. Meanings are made through interaction between 'actors in RSGs' and it is a 'technological frame' that structures the interaction of the 'RSGs' (Bijker, 1995). A 'technological frame' refers to 'the concepts, techniques, and resources' (Bijker and Law, 2000) that influence and influenced by the interaction which leads to the construction of meanings and thus to constituting technology (Bijker, 2000).

The social groups are sociocultural and political in that each group shapes and constructs different meanings of technology, even influencing the resistance of the adoption of technology. This diversity in interpretation of technology, which influences the design of technology, is known as 'interpretive flexibility' (Pinch and Bijker, 1984, 1999; Bijker, 1995). Flexibility in interpretation of technology plays an active role in the construction of meaning and design of technology. The concept of interpretive flexibility which can be found in the sociology of scientific knowledge (Bijker, 1995) has been adapted and developed further in SCOT. Interpretive flexibility provides a view that there are multiple meanings constructed in technology by different social groups, depending on their social background. This helps us to understand the process of constructing meanings of technology which has implications for its design and use. The SCOT perspective argues that through stages, there is a reduction in interpretive flexibility of technology and eventually the technology becomes stable, in other words, technology reaches a stage where its predominant meaning has been constructed.

However, some have criticized the closing of the stages of the construction of technological meanings too early, in other words, SCOT has failed to consider a continuous act of constructing a meaning through the usage of technology by the involved actors. It has also been argued that SCOT has limitations in its view on interpretive flexibility in that it needs to extend its scope to examine the way in which technology is appropriated and redesigned by the user (Kline and Pinch, 1996). SCOT

embraced the challenges in its research scope and recognized technology as an active agent to influence the interpretive flexibility of technology. This became known as the co-construction of social groupings and technology (Bijker, 1995). Consequently, there have been some attempts to apply SCOT to technology in use (Kline and Pinch, 1996). It is to rectify and develop SCOT further that technology is a social artefact and it evolves continuously as a social system even after the adoption. It is also worth noting some other criticisms of SCOT. For instance, Orlikowski (1992) in her 'duality of technology' paper, criticized SCOT for 'downplaying the material and structural aspects of interaction with technology' without further explanation. Her criticism implies that SCOT is a highly user/social-orientated perspective. However, SCOT does consider such material and structural aspects of interaction and these aspects are embedded in the interaction itself. What it does not do is making these aspects explicit. For example, Bijker's studies which are mentioned above recognized social structure such as gender and power relationships in the examination of the development of technology.

SCOT provides a perspective that frames the research design of this thesis and the SCOT framework which is discussed later is adapted and modified to analyze the case study data of Chapter 5 in order to examine the GCS phenomenon that are embedded in the users' daily activity. The details of modifications made for this particular research purpose, the justification for the modifications and the application of the SCOT framework are discussed below in section 3.5.1. The following section discusses the role and the suitability of case study as a method that supports the research perspective.

3.4 Case study

Case study has been characterised as a diverse method (Blonk, 2003) in that it provides rich data, both qualitative and quantitative (Yin, 1989; 2003) from multiple sources. Case study research can be designed, conducted and reported in different ways (Yin, 1989; 2003). Case study research is said to be the most well used approach (Avison, 1997) and accepted as a valid research strategy within the IS field (Klein, 1999) as it is well suited to understanding information systems in an organizational

context despite the fact that many of case study researchers take a positivist perspective (e.g. Benbasat, 1987; Lee, 1989; Yin, 1989, 2003). However, the strength of the case study is its ability to provide a framework to house various types of evidence: documents, artefacts, interviews, and observations (Yin, 1989; 2003) and to give a holistic view of a phenomenon.

However, the case study method has been criticised for its lack of generalizability (Galliers, 1990, 1992) due to weak internal and external validity (Zmud et al., 1989) and the fact that generalizations are always temporally and contextually relative (Lincoln and Guba, 1985). This criticism of generalizability of case study has been discussed from two aspects; first, from the rigorous usage of the case study method from an interpretive position, Orlikowski and Baroudi (1991) argued that the validity is maintained through the plausibility and cogency of the logical reasoning used to describe results by drawing inferences from extrapolation of one or more individual cases (Orlikowski and Baroudi, 1991). Second aspect was from the approach of the method itself as Lincoln and Guba (1985) argued that it is ‘a powerful means for building - intuitive, empirical, based on personal direct and vicarious experience’.

The aim of the case study in this thesis is to contribute to ‘the body of knowledge’ (Zmud et al., 1989) that the research strategy is based on examination of GCS-in-use and collection of as much contextual information around the GCS interactions and interrelationships as possible. The case study method is particularly pertinent as it helps to capture ‘a snapshot of reality’, a ‘slice of life’, or ‘an episode’ (Guba and Lincoln, 1981) of GCS-in-use. Therefore, this thesis adopts the case study method in order to examine the actions and processes of GCS-in-use in its ‘real-life events and contextual conditions’ (Yin, 2003), using various data collection techniques: interview, observation, questionnaire, documentation and photograph. These multi techniques enabled diverse views and usages of GCS to surface and to obtain an in-depth understanding of the phenomenon.

As a case study method is ‘not the best method for assessing the prevalence of phenomena’ (Yin, 2003), this research has focused on a specific group of people to

ask questions directly related to the research question. However the availability of the interviewees had to be taken into account.

Having established the use of case study as a research method, designed to capture the issues of GCS-in-use, the strategy developed for a research framework was to formalize the stages in the investigation. Two pilot studies took place; the first pilot study consisted of questionnaires and follow-up interviews and the second, in-depth interviews and these led to the tightening of the research focus for the two following case studies. Various data collection techniques were used in the case studies in order to obtain a rich data set such as semi-structured in-depth interviews, observations, questionnaires, documentation and photographs. The documentary evidence collected included; copies of the paper calendars both personal and work related and the print outs of GCS, timetables, copies of email related to the usage of GCS and photographs of the working environment and the interviewees' calendars. Photographs helped to locate the artefact in time and space acting as a reminder to refresh the memory of the researcher during the data analysis.

The following sections examine the data collection techniques: interview study, observation and questionnaire and how they were used in this thesis respectively.

3.4.1 Interview

The interview study formed the main part of the data collection as it is regarded as the primary source of case study evidence (Yin, 1989; Myers, 1997; Yin, 2003) to study actions, interactions and relationships. The interview method has been used extensively in calendar study (Kelley and Chapanis, 1982; Kincaid et al., 1985; Ehrlich, 1987a, 1987b; Beard et al., 1990; Payne, 1993; Mosier and Tammaro, 1997; Palen, 1998, 1999; Blandford and Green, 2001). However, interviews have been criticised in two aspects: firstly, bias of the interviewer and secondly, bias of the interviewee. In order to minimise such biases Walsham (1995) recognized that the key issue is balancing between excessive over-direction and passivity.

The criticism of interview study can be seen from two aspects. Firstly, in relation to the bias of the interviewer, the problem is with the poor construction of the interview questions (Yin, 2003) due to the influence that the interviewer's subjective mental frame has on the issue. Heidegger (1993) argued that 'every inquiry is a seeking. Every seeking gets guided beforehand by what is sought'. For example, the question of 'who is she?' is already guided by the interpretation, previous experience, assumption and perception of the enquirer for example, what it is like to be a female, the very act of seeking. Secondly, criticism of the interview study can also be seen from the interviewee's response to the questions in that there are inaccuracies in their response due to poor recall and reflexivity (Yin, 2003). The context has been abstracted from situated time and space. The familiar saying is that the 'interviewee gives what interviewer wants to hear' (Yin, 2003). For Giddens (1984), 'actors may be unable to give an account of their actions because they form part of social routines of which they are only tacitly aware'.

In order to minimise such biases discussed above, this research gave careful attention to the formulation of the interview questions. The interview was designed based on multi perspectives and provided room for interviewees' reflection on their calendar usages. A semi-structured, open-ended interview approach was chosen in order to obtain information outside a fixed structured format (Silverman, 2001) and to ask opinions of the interviewees of the phenomena (Yin, 1989). The interview data was then supported by observations and documentation techniques and the results of which were then compared and contrasted with the literature review in section 2.4.

The interviews took between 15 to 30 minutes each. The details of the case studies including the interviews are described in the following Chapters 4 and 5 with the findings. After a comprehensive review and initial analysis of the taped interviews, the most relevant parts of the data were transcribed as direct quotes and the rest were made into a summary based on each verbal sentence as shown below (DIAGRAM 3.1). This was an iterative process, seeking the fine grain of analysis of the data focusing upon context and mannerism of the vocabulary in use (the meaning of the words rather than taking the words out of context) as the meanings can only be made in context (Harvey, 1995).

DIAGRAM 3.1**Example of the data preparation**

5

5.3 What do you mean by sometimes? Is it depends on events?
 In her job, she does not feel the need for it. We call and if they are there, speak to them and if no, leave a message. Her job is to do with dealing with issues. The time she has used it for personal reason to remind herself to do something for instance, she set it up on every Friday to remind herself that she has to fill a timesheet. Sometimes, this reminder comes on Monday instead on Friday. A manager puts entry in her calendar and she gets reminder. Don't know how the manager does it. She does not even have to say yes or no but then she does not think that she has a choice of saying no. "It is a team meeting so you don't really have a choice of saying yes or no".

The transcription of the data, coupled with repeated listening of the interview tapes gave an understanding of the data. One of the interviews is provided as an example to enable comparison between the fully transcribed and the sentence summary format, used in this thesis (see APPENDIX A.1).

3.4.2 Observation

Observation has been used in conjunction with interview study, as it provides additional information about the phenomena (Yin, 1989) and helps capture details. Observation took place at case study sites and the observed practices and processes were noted down in order to temporally and spatially locate them. These observation notes were augmented with photographs to help recall the contextual settings during the analysis. Vidich (2000) asserted that the act of observation can be influenced by the preconception of the researcher that observation in this research has been used to prompt a further investigation in the form of interviewing or used to confirm the phenomenon uncovered by the interview.

3.4.3 Questionnaire

The in-depth interview study and observation notes were supplemented by questionnaires. The aim of using questionnaire was to gather information on some of the broader questions and use it as confirmation to the interview findings as well as a prompt to future interview questions. The questionnaire was used in both the pilot study and the main case study but with different aims. The questionnaire used in the pilot study stage one focused on divisions of large companies. It was to provide a snapshot of a view on the general practices at work, at a particular point in time

(Galliers, 1990, 1992) as the phenomenon has been abstracted from day-to-day business (Silverman, 1998), establishing the social and research boundaries of GCS usage. The pilot study questionnaire gave firstly, a chance for the respondents to reflect upon their calendar usage. Secondly, it allowed the research to gauge background indicators such as uptake of different calendar formats. During the main case study, the questionnaire played parts firstly, as one of the data collection techniques for the comprehensive understanding of the phenomenon and secondly, as a prompt for further investigation to confirm, initiates or elaborate upon as necessary during the interview.

The questionnaire follow-up interviews in the first stage of the pilot study, revealed a problem of the questionnaire, in that it lacked ways of uncovering the context such that consequently, the questionnaire method was deemed no longer suitable and therefore in-depth interview was preferred.

In this section, the collection of the techniques applied to the pilot and main case studies were examined. The interview study was chosen as the main data collection technique and the observations, questionnaires, documentation and photographs as secondary data collection techniques supporting the interview data. The next section discusses the analysis techniques.

3.5 Analysis techniques

The primary concern of the thesis is with the discovery of issues in the data, allowing for new ideas or patterns to emerge (Miles and Huberman, 1994) and make a space for the 'creative leap' (Mintzberg, 1979). A grounded approach provided a perspective to capture issues and themes, emerging out of the data. The GCS attributes and interrelationships were allowed to emerge and the approach had to be 'played by ear'; it needed to 'unfold, cascade, roll, and emerge' (Lincoln and Guba, 1985).

The pilot study highlighted further issues to be uncovered. The research approach therefore had to reflect this and the data collection and analysis of the data had to adapt a grounded approach along with a confirmatory one. Using the grounded

approach, a pilot study firmed up the research framework and helped to reformulate the interview questions for the main case studies. The grounded approach offered a context and situational awareness perspective.

The pilot studies also tested the combination of the research and analytical techniques to see if they facilitate the capture and analysis of the interrelationships and processes of temporal coordination. Reflecting on the outcome of the pilot case study for the main case studies, following a grounded approach of uncovering emergent issues, analysis took an iterative process, using two principle techniques, an application of the modified SCOT (M-SCOT) framework and pattern-matching (Yin, 1989, 2003).

3.5.1 Modification of the SCOT (M-SCOT) framework

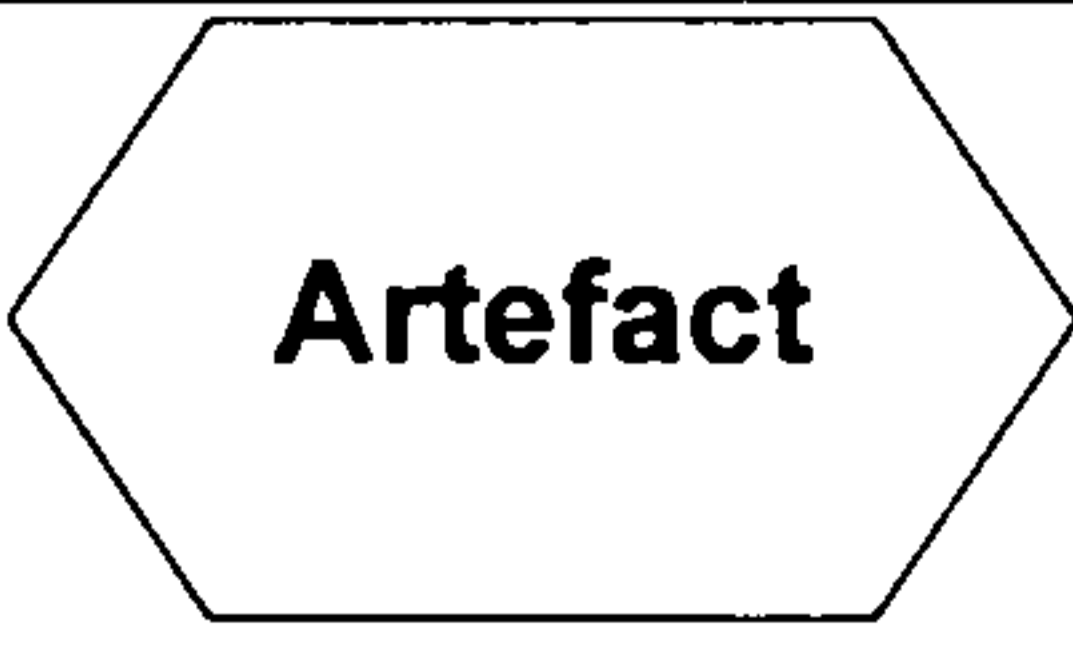
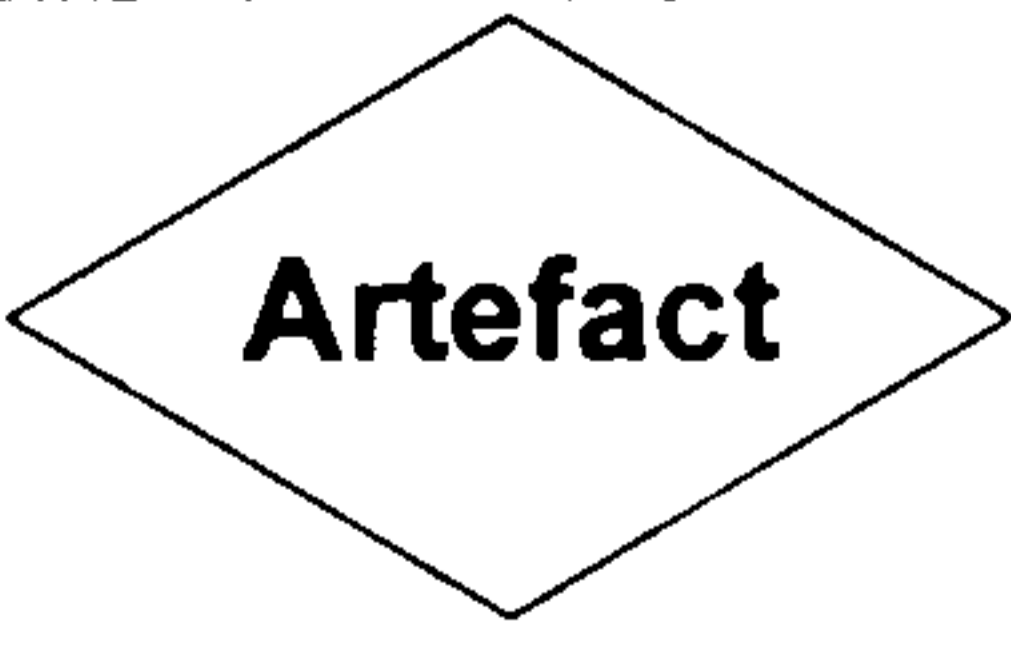
The SCOT framework was extended to provide a method to examine everyday GCS usage based interactions at work. As discussed in section 3.3, SCOT is designed to capture and illustrate the social dynamic in the history of the development of technology. It is a framework specifically developed for the study of the development stage of technology. Bijker's empirical studies were based on historical data sources. However, this thesis has modified the SCOT framework to include and identify on-going usage of technology with a specific interest in the process of temporal coordination.



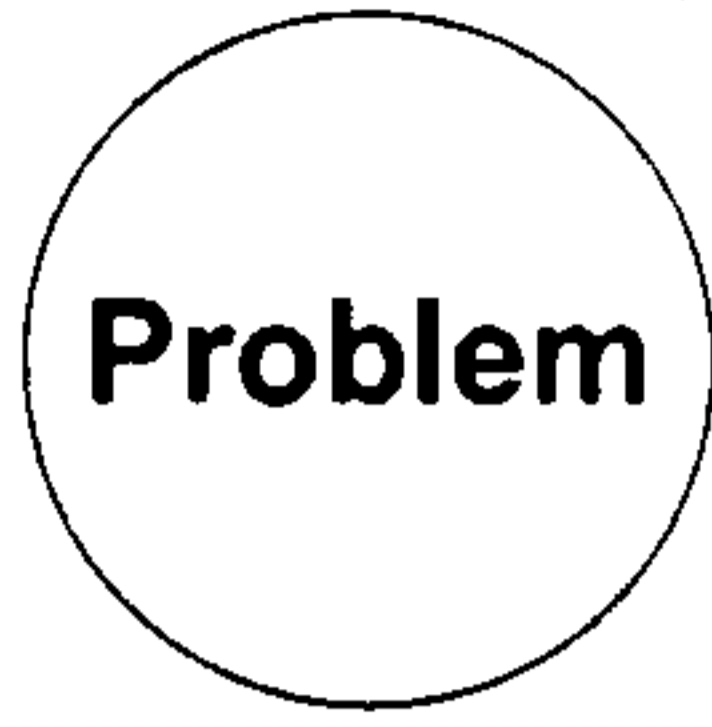



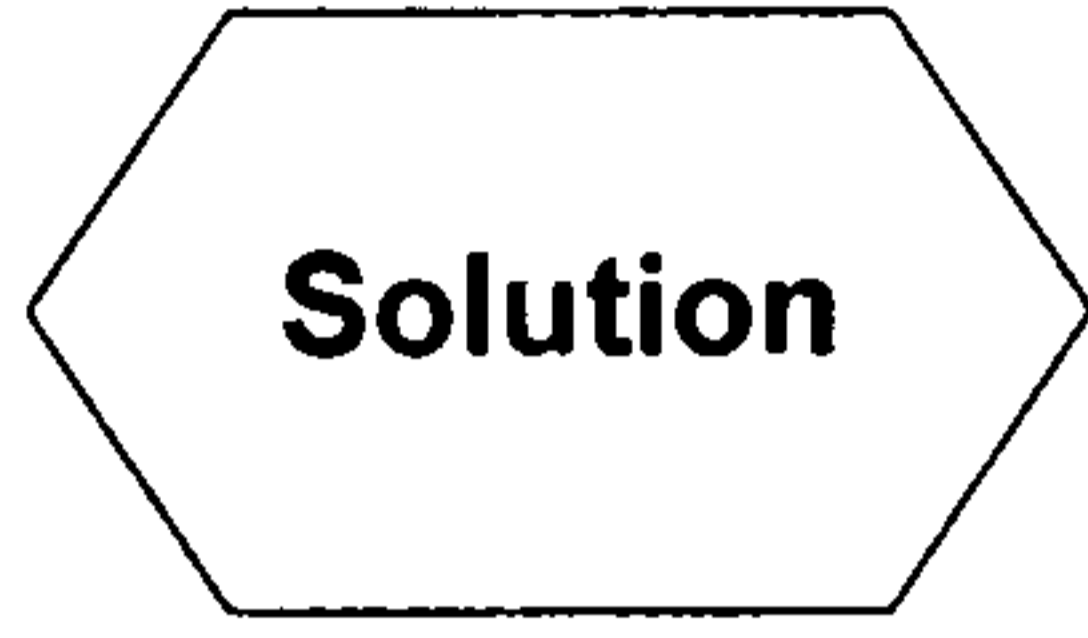
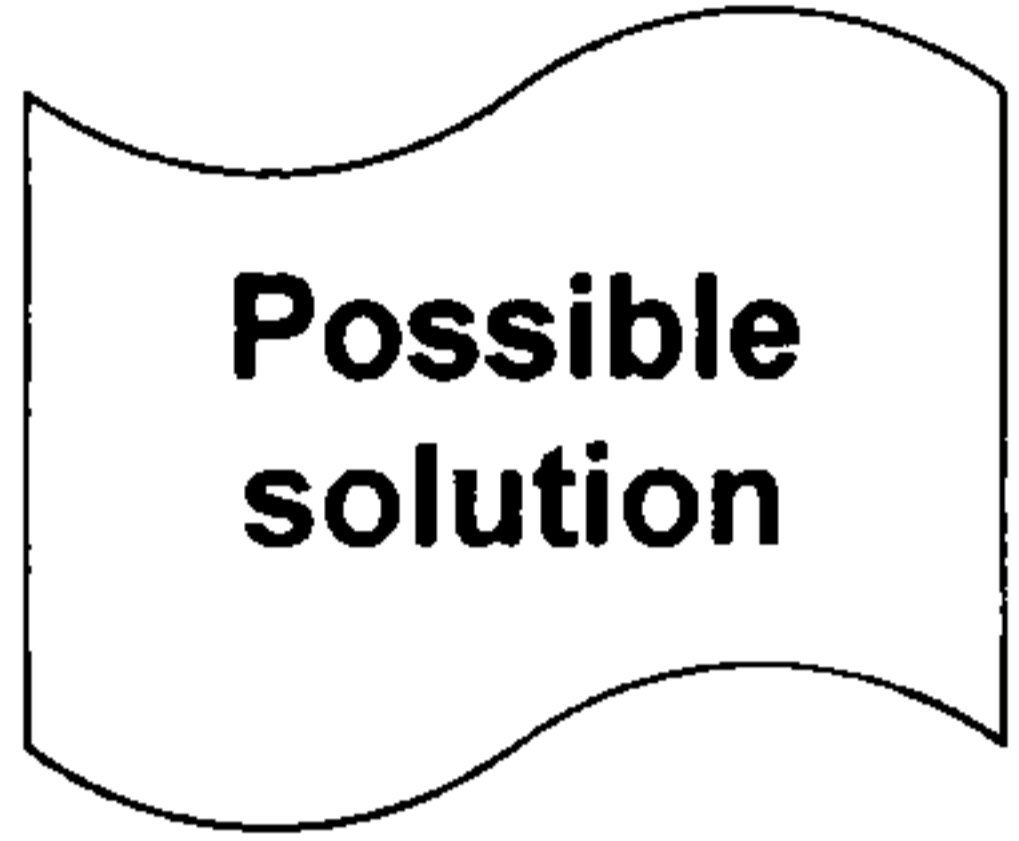
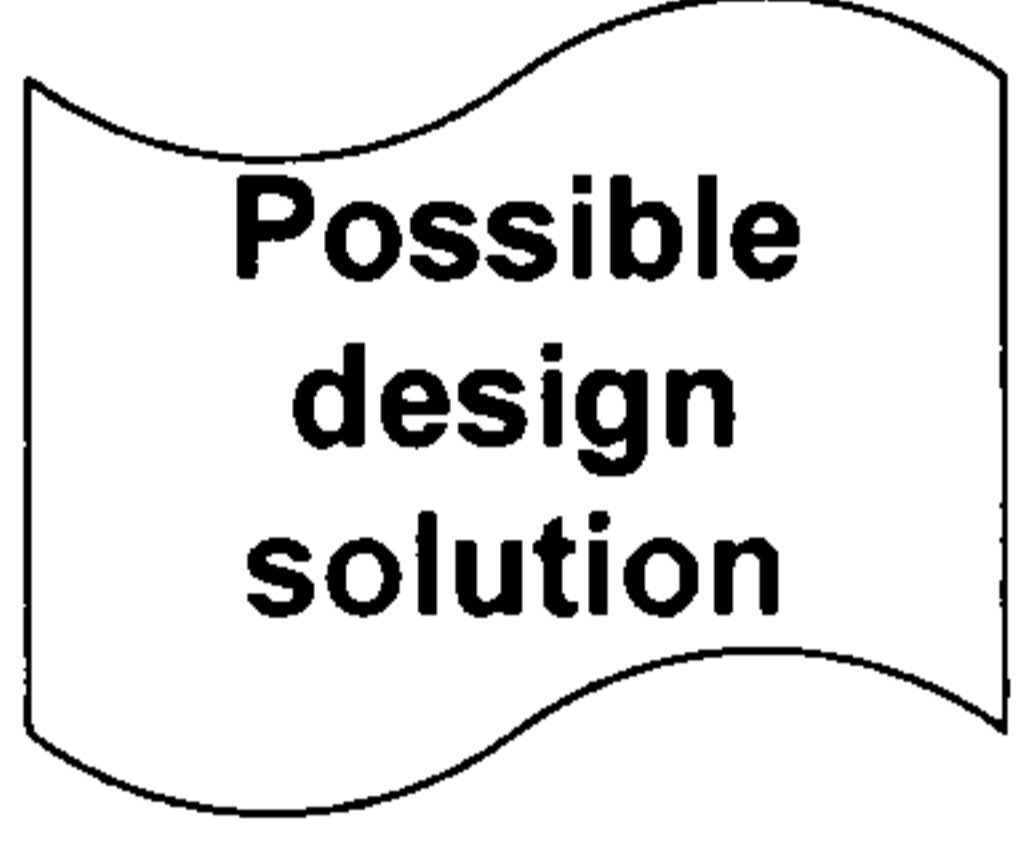
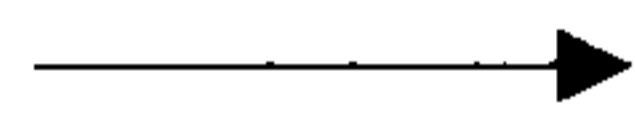
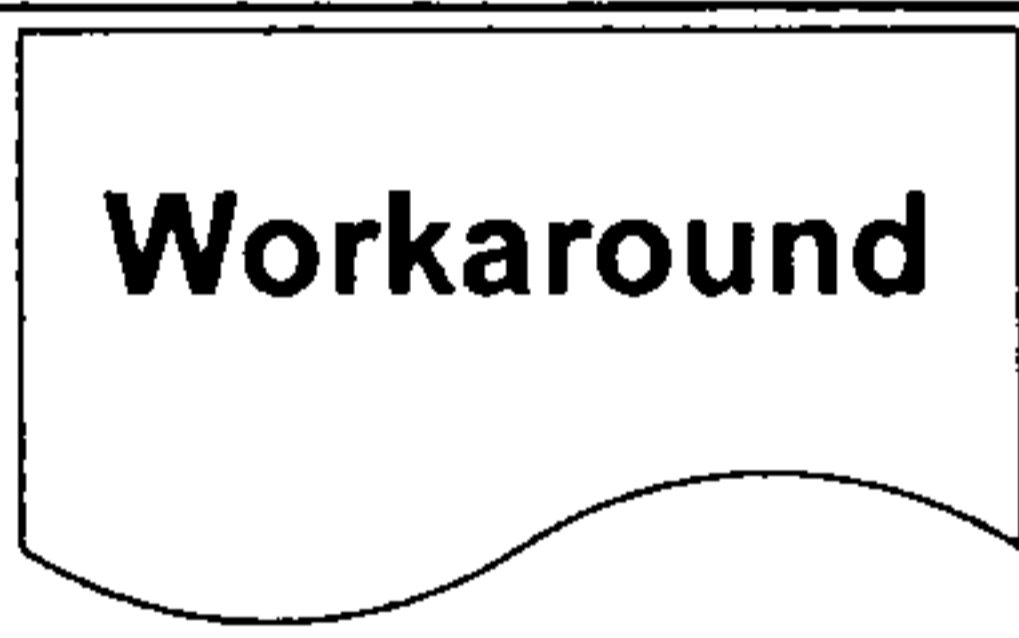
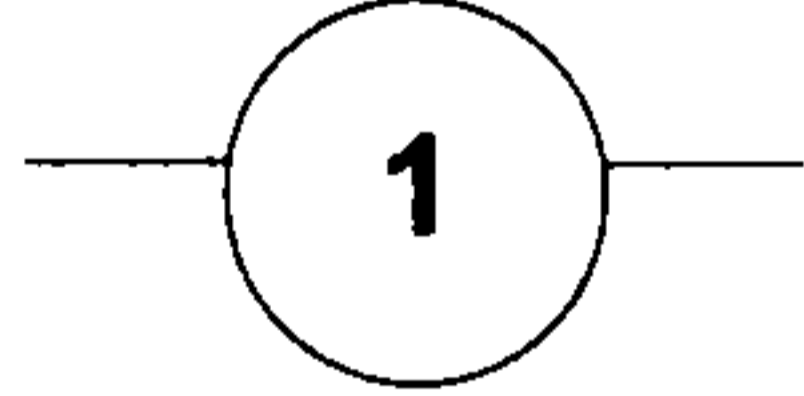
The mechanism of the SCOT framework is relevant to the aims of this research in this stage, firstly to uncover dynamic relationships between the 'RSGs' and also between the 'RSG' and the technology and secondly, to present the interrelationship of social dynamics of actions, responses and interactions in a comprehensive map to capture the issues of GCS-in-use. As the focus of this research is on GCS-in-use, taking into account the evolving nature of the relationships and interrelationship, it was necessary to modify the SCOT framework which is called M-SCOT thereafter. The original SCOT framework was extended to be comprehensive in an analysis and presentation of the GCS-in-use data. The M-SCOT is explained in the table below (TABLE 3.1) by comparison with the original SCOT framework.

The M-SCOT framework was applied to two main case studies within an organizational setting where the technology has been in place for some time and the technology appears to be at a mature stage. The original concept of SCOT does not cater for such stage as discussed in section 3.3. This research postulates that the meaning of technology evolves continuously in that, the concept of stabilization (the closing stage of the development of technology in the original SCOT) has been taken here as a state that is subject to change. The M-SCOT was applied to the first case study in Chapter 5 and through the operationalization of the M-SCOT framework, the framework was further refined and adjusted for the purpose of this study. This was then applied to the second case study which acted as a validation for the M-SCOT framework. However, the adoptability and suitability of M-SCOT in a wider IS research requires a further research.

The original SCOT framework is based on the three main aspects of a technology: 1. 'Relevant Social Group (RSG)', 2. 'problem' and 3. 'solution'. The M-SCOT extended and further divided the 'problem' into 'social issue' and 'design issue' and the 'solution' into four: 'solution', 'possible solution', 'possible design solution' and 'no solution'. The M-SCOT also included the identification of 'workaround' which is the appropriation of the technology. It is different from the 'solution', as the act of 'workaround' signifies what technology does not provide and also how and why the 'RSGs' have to employ social skills and practices 'in response to unexpected opportunities or challenges' (Tyre and Orlikowski, 1994). There were reasons for both 'social' and 'design' issues that could be clearly identified, given either by interviewee or uncovered during the analysis of the data. These are indicated in numbers in the diagrams and the supporting evidence is attached in the separate section. The complete M-SCOT framework analysis for both case studies is presented in the appendix (APPENDICES C. 3 and C. 4).

TABLE 3.1
Comparison between SCOT and M-SCOT Keys

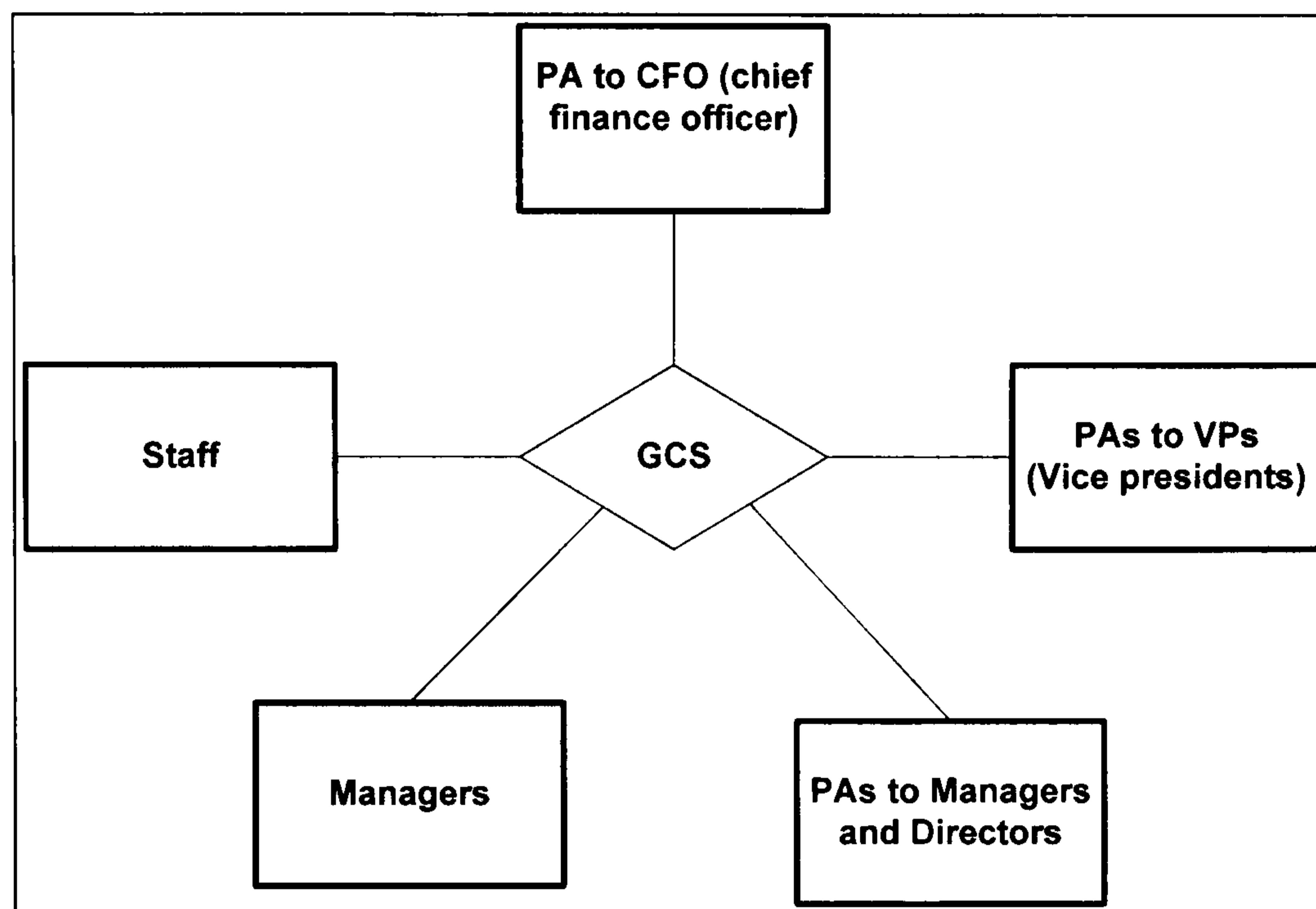
Description	SCOT	M-SCOT
Artefact		

Relevant Social Group (RSG)		
Problem/Issue (in M-SCOT, the issues are either specified by the user or uncovered by the researcher)		
Design issue		
Solution (in the original SCOT, solution is related to the change of the design of the artefact itself but in M-SCOT, solution means the changes in usage and perception etc.)		
Possible solution (these are theoretical solutions to solve the issue)		
Possible design solution		
No solution arrow (this indicates that the issue is not resolved and the solution is not known)		
Workaround (indicates any actions taken by the user to workaround the given technology or context of technology)		
Reason number (reason/explanation of issue and solution. The number inside of the circle corresponds to the numbers in the Notes which includes the supporting evidence)		

The first stage of the M-SCOT framework identifies the 'RSGs' in the case studies as shown in the example of diagram 3.2. Groups, as the real organizational units (Leavitt, 1973) were identified based on the organizational structure and their responsibilities in the organizations. This was to make sense of the relationships, actions and interactions and finally to draw them to a cohesive understanding of the phenomenon. Studying the groups in the organization has been argued to be the most sufficient and effective

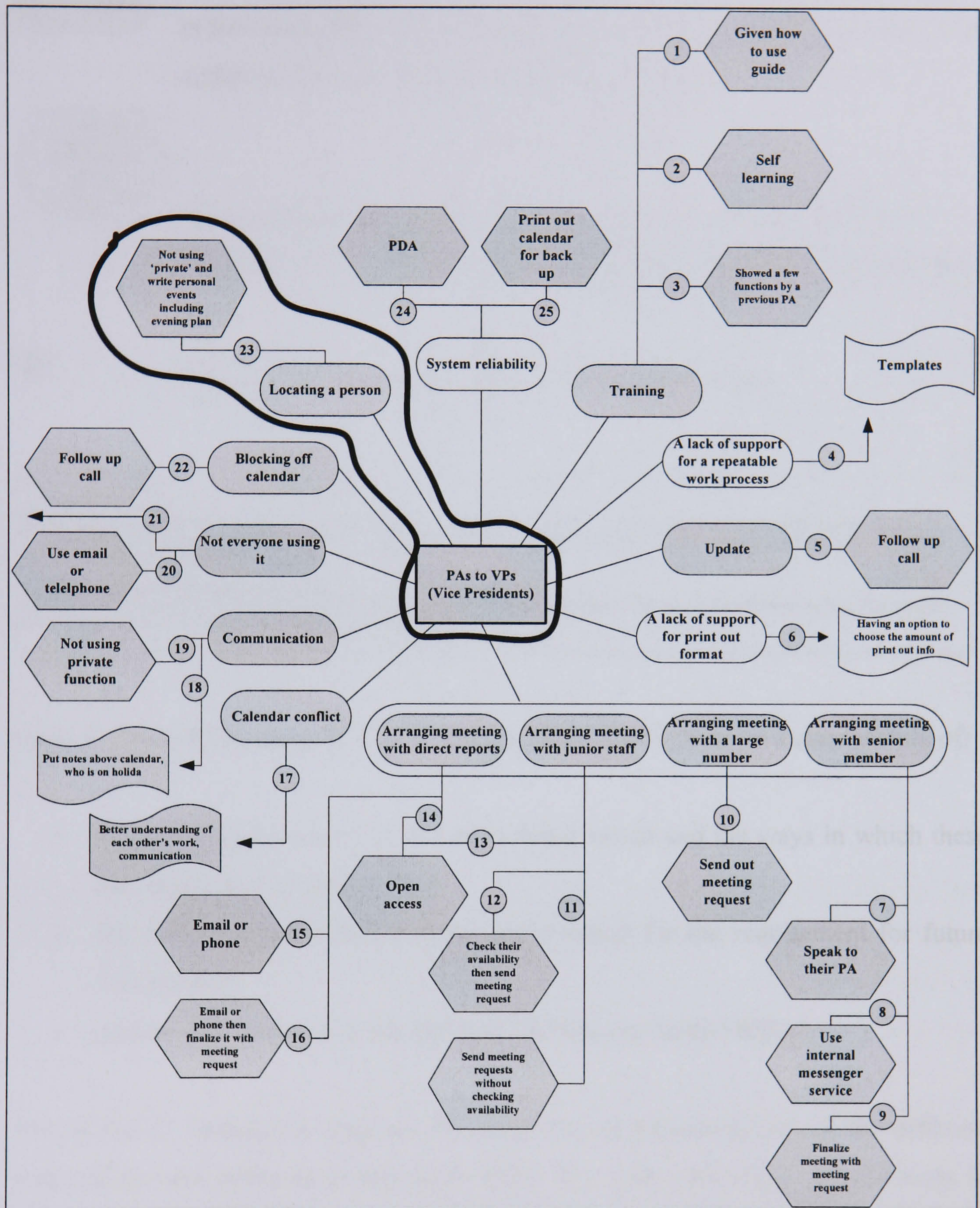
way of understanding and predicting the organizational acts (Leavitt, 1973). Therefore, by understanding the groups' dynamic, we can make an inference of the organizational work practice and process.

DIAGRAM 3.2
Example of the M-SCOT 'RSGs'



The second stage is to place each 'RSG' in the center to examine their actions and interactions as shown in the example of diagram 3.3. In the analysis of the data, the designer as a social group is not represented directly but it is assumed that the designer's interpretation of technology is embedded within the technology itself. The details of operationalization of the analysis of the M-SCOT framework are discussed in Chapter 5 and 6.

DIARAM 3.3
Example of the M-SCOT framework analysis



An example (circled in line) of the reading of the M-SCOT framework diagram above is explained below.

**PAs to VPs
(Vice Presidents)**

is one of 'RSGs' and one of the issues that emerged out of the data was

the difficulties in

Locating a person

in this case, difficulties in locating VPs. Because of their position in the company, they are sought after by many people.

Not using
'private' and
write personal
events
including
evening plan

As a result/therefore, PAs have an open view setting of the VPs' calendars which include VPs' evening plan as a solution to the above issue.

23

This number corresponds with the actual data below.

23

15.1 What do you do?

Mainly manages his calendar but there are two others that she sometimes manages in case when people asks whereabouts of the person, she can check the calendar and let them know when they can reach him. Because they are senior managers and people need to know where they are. She has all write in access

17.9 Does she put her personal arrangements?

Yes. She has to know where the boss is all the time in order to help work move smoothly so they rely on the calendars heavily. Her boss puts her evening plans so that she does not arrange anything at that time

Some of the benefits of the M-SCOT framework are that it presents a clear picture of;

- the on-going processes of the issues being raised and the ways in which these are resolved or worked around,
- the design related issues and the social issues for the requirement for future development
- and the identification of the different GCS-in-use of the 'RSGs'.

The M-SCOT framework diagram illustrates the operationalization of the different relationships and interactions that each 'RSG' has with technology and the ways in which different meanings are constructed by different 'RSGs'. It shows the multi-dimensional characteristics of GCS. The M-SCOT framework provides a means to make sense of the technology in a dynamic social environment.

3.5.2 Pattern-matching technique

Miles and Huberman (1994) explained that identifying patterns from data and drawing some sort of understanding of a phenomenon is such a common human practice that we all are well capable of doing it. This explains our natural ability to coordinate data in recognizing patterns and through practice, develop a pattern-matching technique. In the data analysis, coding (Miles and Huberman 1994) was used in conjunction with the pattern-matching technique to prepare and analyse the data. Yin (1984, 2003) explains that the pattern-matching technique is the most desirable strategy for case study analysis and in particular, it strengthens the internal validity of the case study (Yin, 1984, 2003). He argues that in using the pattern-matching technique, if the pattern is found, it validates the prediction and if the pattern does not fit, it allows the modification of the prediction.

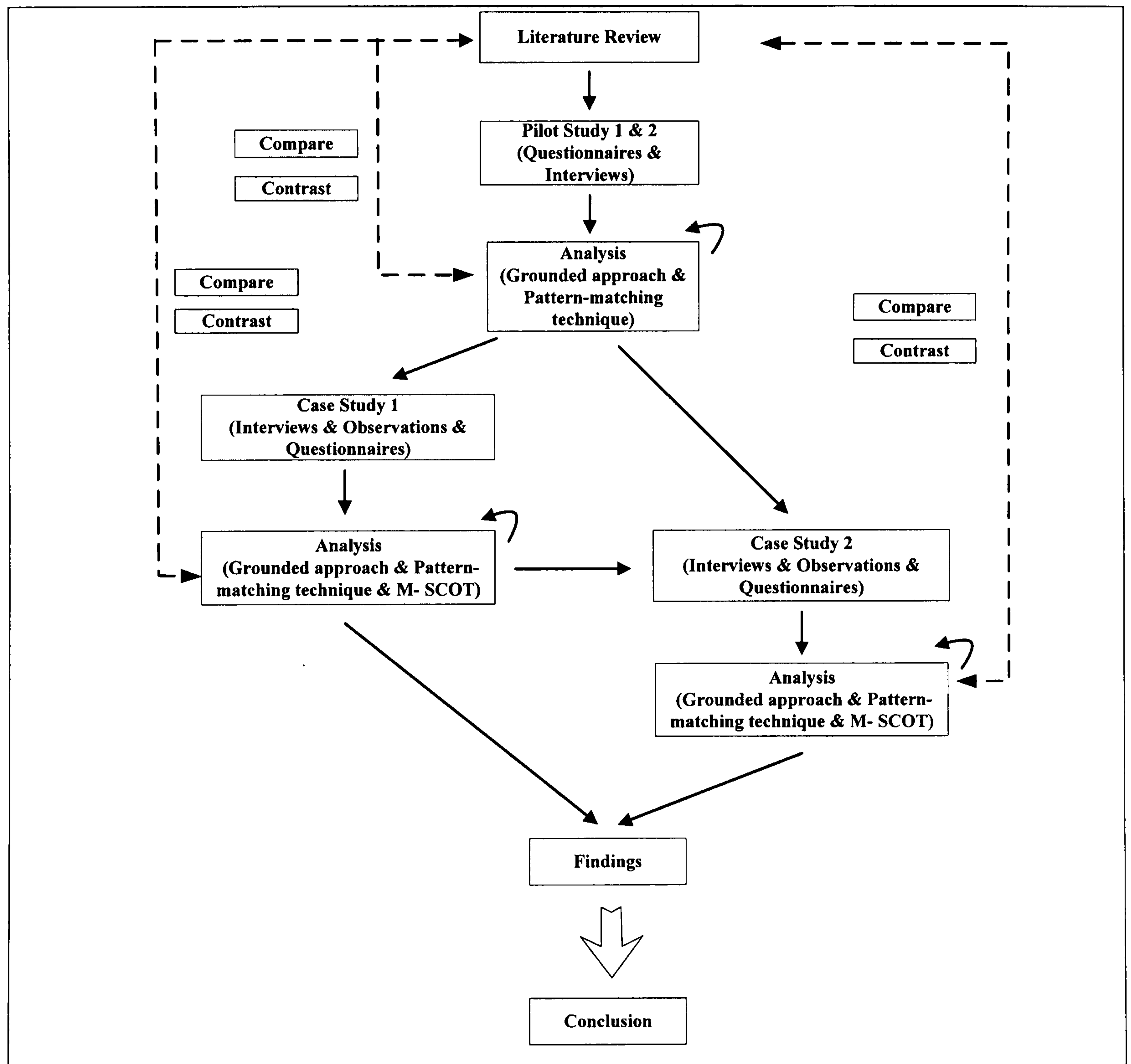
The analogy of the process of the pattern-matching technique is that it is a process of laying two pattern printed transparencies upon a light box, on top of each other to examine what matches and what does not. This leads onto further investigation of the issues or examine a particular aspect of issues that did not match, or examine why only partially matched or were missing.

After the interview tapes were transcribed in the form of summaries, an iterative process took place to capture the emergent issues. The pattern-matching technique was used in conjunction with the grounded approach throughout the case studies in order to make statements at a broader level of analysis to interlink concepts across cases and with the literature. Classification frameworks built in section 2.4 were particularly useful in application of the pattern-matching technique as they provided the characteristics and the attributes to work with. The pattern-matching technique in this thesis acted as a validating mechanism firstly, for the findings in each stage of pilot study and case study and secondly, for the grounded approach that when the matched pattern is found, it confirms the validity of the usage of the grounded approach.

3.6 The research and analysis framework

This section presents an overall picture of the data collection and analysis techniques used in this thesis. It explains the way in which the research framework was formulated.

DIAGRAM 3.4
Research and analysis framework

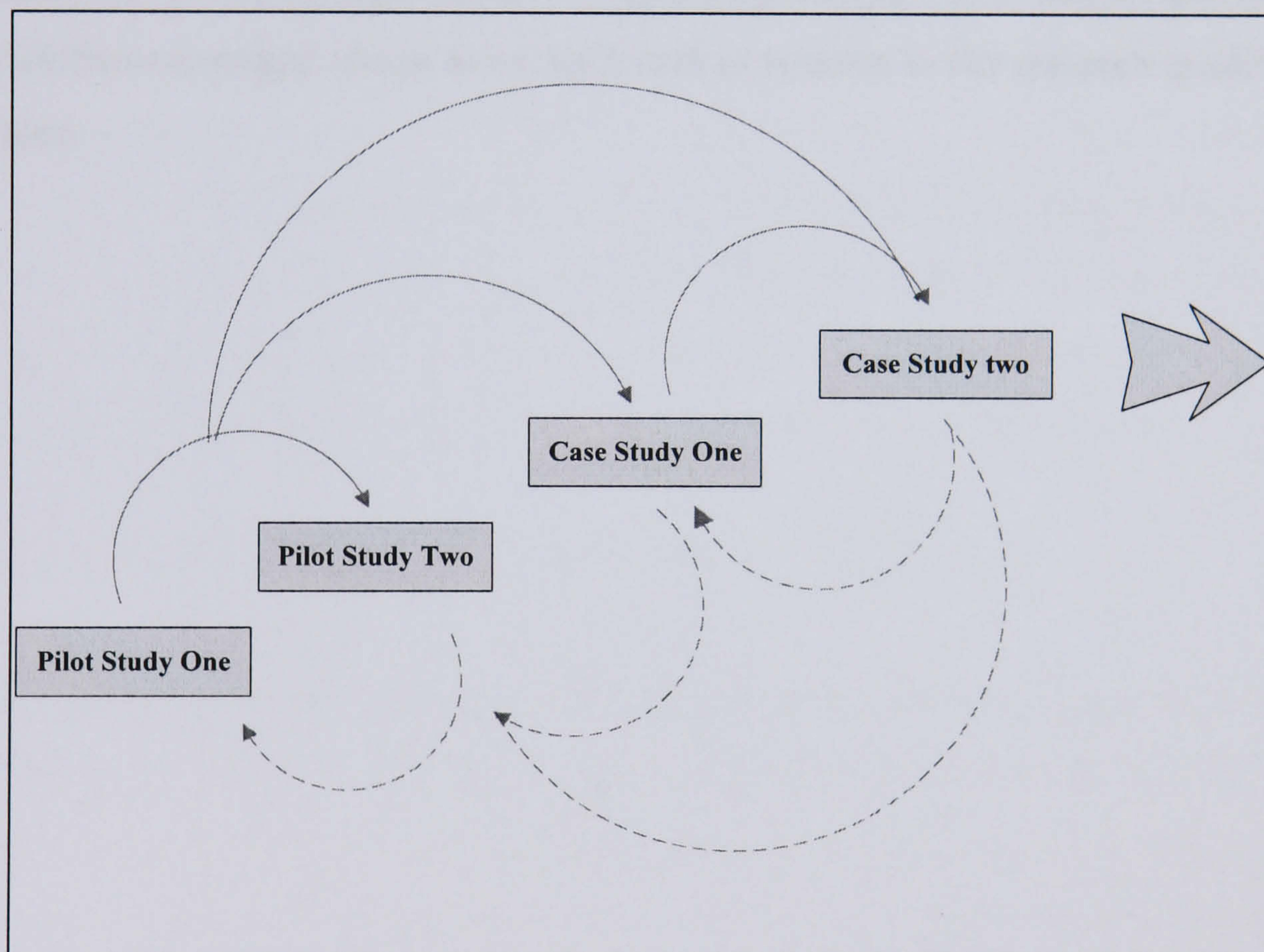


The two pilot studies and two case studies are seen as separate stages in this research and there are aims and objectives that govern and separate the two pilot studies from the two case studies. This study has taken a progressive research approach, diagram 3.5 shows how these pilot studies and case studies are related. Each stage acts as a

confirmation of the previous findings as well as an exploration of uncovered phenomenon. The going-back dotted arrows represent the verification of the findings. Progressive research approach underpins the research design of this thesis. Embracing the exploratory nature of research, progressive research approach helps and caters for; firstly, the ways in which dynamic social environment can be examined and secondly, staged analysis, enabling confirming of the findings and initiating further lines of enquiry.

This has been facilitated by the pattern-matching technique which enables progressively tightening of the focus upon the phenomenon.

DIAGRAM 3.5
Progressive research approach



3.7 Summary

This chapter examined the research perspectives, method and techniques adopted in this research and discussed how to go about capturing the issues of GCS-in-use and studying the interrelationship of the GCS attributes. In this research, GCS are considered as socially constructed artefacts and the meanings of GCS are constructed

through the GCS mediated interaction between ‘RSGs’. In order to have a complete picture of GCS phenomenon that this research is seeking, it was necessary to use a case study method, employing multi techniques to collect data such as interviews, observations, documentation, questionnaires and photographs. It was then crucial to let the issues and the relationships emerge out of the data, using a grounded approach, progressively building a framework of the state of GCS temporal coordination. The pattern-matching technique was used to cross-check against findings of the previous stage and also issues identified in the literature, acting as a validation tool. As an analytical framework, the original SCOT framework was modified and extended which led to the modified SCOT, the M-SCOT framework. The pattern-matching technique and the M-SCOT framework were used to understand not only the individual GCS attributes but also their interrelationships. In the next chapter, rationalisation of the emerged issues found during the pilot case studies and the ways in which these emerged issues were dealt with in relation to the research questions are discussed.

CHAPTER 4

Pilot Study: proceeding with the research framework

4.1 Introduction

Having reviewed the current state of understanding of GCS in Chapter 2, the investigation proceeds by building upon this literature work to confirm the GCS attributes, and examine the interrelationship between them in the social environment using a progressive research framework, discussed in section 3.6. The pilot study was divided into two stages: stage one; consisted of questionnaires and follow-up interviews and stage two; in-depth interviews. The focus of this chapter is to report on the findings of the pilot studies, using the data analysis of a grounded approach and a pattern matching technique to examine the underpinnings of GCS-in-use. Sections 4.2 and 4.3 start with descriptions of the backgrounds of the pilot studies. Each section is followed by the methods and analysis of the findings. Section 4.4 discusses the key finding of the pilot study in order to provide groundwork for further investigation in the next chapter. Finally, section 4.5 provides the summary of this chapter.

4.2 Stage one: examining the GCS attributes

In the first stage of the pilot study, the questionnaires and the follow-up interviews were conducted. The questionnaires were utilized to gain an overview of GCS usage to establish if the GCS attributes identified in the literature could be confirmed or not. The objectives of the follow-up interviews were firstly, to extract further details upon the answers given in the questionnaire and secondly, to validate the questionnaire findings, thirdly, to assess if there were ‘other’, previously missed issues that would emerge and finally, to explore the issues of the ‘workaround’ attribute. As ‘workaround’ attribute is highly contextual, the subject of ‘workaround’ was explored using the interview rather than using the questionnaire. In terms of the ‘design’ attribute, as discussed in section 2.4.3, this research focuses on exploring and investigating the social rather than technical mechanism of the temporal coordination. Therefore, the issues of the ‘design’ attribute were also not explored in the

questionnaire. However, because of the interrelated nature of social and design issues, the findings of this research can inform and benefit the future design of GCS. The table (TABLE 4.1) below shows the construction of the questionnaire (see APPENDIX B.1) in relation to the identified GCS attributes in the literature work (see DIAGRAM 2.1).

TABLE 4.1
Construction of the questionnaire

GCS Attributes	Question No.
Deployment	Q.8
Training	Q.3
Gaining a critical mass of users	Q.1, Q.2, Q.4
Privacy	Q.5, Q.12
Trust	Q.7
Temporal control	Q.8
Workaround	-
Design issues	-

Other purposes of the questionnaire were to elicit the key functional characteristics of GCS (Q.6) and help to define the ‘usefulness’ (Q.10) by asking the respondents to indicate the influence of GCS on work efficiency on a scale of 1 to 5. Additionally information was sought on outside office GCS usage (Q.9).

Two case study sites were carefully selected for three reasons. Firstly, the same GCS products were available in both sites, supplied as part of the office suite, with usage greater than a year. Secondly, these two sites shared a similar business background as being part of multinational companies which would appear to suggest that there was a need of virtual coordination and collaboration of work. Finally, at the first site (IT company), people were familiar with GCS they were using as the application was originally developed by their company. It has been said that unfamiliarity with software acts as a factor of user resistance (Markus, 1983; Hirschheim and Newman, 1988). In other words, familiarity with the software could influence the level of usage. Consequently, it was necessary to include a second site, not IT based to represent other business interest in GCS usage.

The section below discusses the background and the relevant details of the organizations where the questionnaires and follow-up interviews took place. This is followed by general findings in 4.2.2. The sub-sections 4.2.3 and 4.2.4 explain the two main findings of stage one firstly, the ambiguity of definition and understanding of GCS and secondly, perception of GCS as a surveillance tool. This section concludes with a brief summary of stage one, discussing the implications of the findings for the next stage.

4.2.1 Background of stage one pilot study

The questionnaire and the follow-up interviews took place in two multinational companies; 'INT' (Pseudo-name) and 'CLA' (Pseudo-name). They have headquarters in the USA. Both case study sites used the same software, 'CreateCal' (Pseudo-name) with free/busy view setting as a part of client-server collaborative software. Both of these two pilot studies were conducted over a period of one month in 2001. The company names and the specific product name of GCS are disguised using pseudo-names due to the confidentiality agreement with the companies. In addition, revealing the specific product name of GCS was considered to be a hindrance to achieving the aim of this research. The interest of this research is to explore the characteristics of GCS rather than particular functions of the particular GCS product. This anonymity was also carried forward for the main case studies in the next chapter.

'INT'

'INT' is a department of a major IT company which has over one million employees worldwide. This is a multinational company having local operations and clients all over the world. One of the main business activities of this company is the development and marketing of leading client-server collaborative software integrated with functionalities such as, email, personal information management (PIM) tools, calendar and scheduling application ('CreateCal') for medium and large size organizations. The case-study department, 'INT' was responsible for tailoring it for the individual customer in Asian Pacific region. In this Asian Pacific region branch, there were approximately 2,080 employees, and the department, where the study took place, there were approximately 60 people.

'INT' started to use 'CreateCal' from the early 1990s since the USA based headquarter notified them officially to use it as a part of good work practice. Staff were expected to use it without any training. There are frequent international telephone and video conference calls with their colleagues abroad and also with the clients due to the collaborative nature of their work, developing and tailoring software. People tend to use 'CreateCal' to view the availability of the people in other countries before setting up the video conference but for the internal meetings, people tend to use telephone or email.

'CLA'

'CLA' is a business division in a major food manufacturing company, belonging to a large US based multinational company, operating in over 200 countries around the world. 'CLA' is the business section of one of the local operations. There were approximately 60 employees, all of whom had access to client-server collaborative software which included the 'CreateCal' application. It was introduced 2-3 years ago, together with an introductory training course for the staff. However, the training did not provide the usage of the functions of 'CreateCal', for reasons elaborated upon below.

The staff arranged meetings using telephones and emails rather than using 'CreateCal' and as a consequence, it was largely perceived as an administration support tool, for the use between the manager and the secretary. As part of the multinational company, the senior management had frequent international video conference but this was arranged by secretaries using telephone and email.

Questionnaires: 'INT' and 'CLA'

Out of 40 paper questionnaires in each site, 27 were returned from 'INT' (67.5%) and 30 were returned from 'CLA' (75%). These high rate of returns were achieved due to the help from the managers from both sites who handed out and then collected the questionnaires. In terms of the questionnaire, there were twenty questions with three open-ended questions which took approximately 10 minutes to complete. The three

open-ended questions also included questions about personal details. The questions were designed to capture an overview of the calendar usage in the organization and the perceptions that they have of GCS rather than being specific to the function of 'CreateCal'.

Follow-up interviews

There were six follow-up interviews: three interviews each from 'INT' and 'CLA'. One manager and two staff were interviewed at 'INT' and one manager and two IT technicians were interviewed at 'CLA'. Each interview lasted approximately thirty minutes. These interviews were conducted in a semi-structured and informal way but contained a core set of questions regarding general calendar and 'CreateCal' usage (see APPENDIX B.2). The design was to elicit personal issues of calendaring practices and also to grasp the interviewees' reflections, knowledge and awareness upon their experience with 'CreateCal'. All but one of the interviews were taped and transcribed. The unrecorded interview with the manager from 'CLA' was notated during the interview.

4.2.2 Overview of stage one findings

The questionnaires were analysed using SPSS and the iterative reading of the follow-up interviews helped to make sense of the questionnaire findings. 14 out of 27 (51.8%) at 'INT' and 7 out of 30 (23.3%) at 'CLA', overall, 21 out of 57 (36.8%) were said to be using 'CreateCal' and this section presents some of the findings to provide an overview from the questionnaires and follow-up interviews.

'Deployment and Training' (Q.8 and Q.3)

In 'INT', staff were aware of the function of the 'CreateCal' and they were expected to use it without training. Even though the decision came from the headquarter as a part of good work practice, the usage remained limited to circumstances for example, arranging international video conferences. People were still using telephone and email as an everyday meeting arrangement practice.

In terms of training for 'CLA', the staff received 3 to 4 hours of training on the functionalities of software, which centred upon training for e-mail operation and there was virtually none for 'CreateCal'. It was considered to be the least important function at the training session at 'CLA'. The problem uncovered in the follow-up interviews was that people found it difficult to learn and some did not even want to learn it.

'Gaining a critical mass of users' (Q.1, Q.2 and Q.4)

'INT' has frequent communications and inter-departmental contact between the USA and other parts of the world, as it is a global company and the nature of their business required inter-country collaboration. Intercontinental video conference and teleconference were a regular occurrence and scheduled through the use of 'CreateCal'. It was seen as a convenient way of sending a meeting request. 'CreateCal' was used well at senior management level as they are the ones attending the worldwide video and teleconferences. However, despite its competence in IT and familiarity with the functions of 'CreateCal', the internal meetings were scheduled using predominantly conventional email and telephone. The possible reason for this is explained in section 4.2.4.

In 'CLA', most of the scheduling meetings were organised through email, telephone and in person i.e. the scheduling work was done in a 'traditional' way. The intercontinental telephone conference calls occur mainly between senior management. 'CreateCal' is perceived and used mainly as administration support software to manage management's calendars.

'Privacy', 'Trust' and 'Temporal control' (Q.5, Q.7, Q.8 and Q.12)

The default view setting of the calendar was free/busy at both sites which meant that everyone had access to other's calendars but it was both not an expected working practice to view the calendar of someone else and some were even unaware of this function. The underlying perception in relation to privacy and trust attributes is discussed in section 4.2.4. These two attributes, together with the temporal control attribute are further discussed in 4.3.2.

Functional characteristics of ‘CreateCal’ (Q.6)

Both sites showed limited functional characteristics of ‘CreateCal’-in-use because of the under usage. The findings were categorized using the classification of the functional characteristics of GCS (see section 2.4.1).

In ‘INT’, 10 out of 27 people (37%) used GCS primarily for ‘supporting meeting arrangement’ and 7 out of 27 (25.9%) for ‘supporting distributing calendar information’, specifically to see the work progress of others. In ‘CLA’, 3 out of 30 people (10%) were said to be using ‘CreateCal’ for ‘supporting meeting arrangement’ and ‘supporting distributing calendar information’, specifically to see what others are doing. The ‘supporting distributing calendar information’ functional characteristic is closely related to the usage of GCS as a project calendar which is discussed in section 4.2.3.

Effectiveness (Q.10)

The question of effectiveness of ‘CreateCal’ was asked in terms of three levels: individual, departmental and organizational, on a scale of 1 to 5, 1 being the most highly effective. Total 21 people said they were using GCS. 18 people out of 21 placed GCS as effective or highly effective at both departmental and organizational levels, and 10 out of 21 placed GCS effective or highly effective at the individual level. The findings from both sites showed that ‘CreateCal’ is considered to be more effective at departmental and organizational levels than at the individual level.

The next sub-sections discuss two main implications of stage one findings.

4.2.3 Stage one analysis: ambiguity of GCS

Through the initial analysis of the questionnaires and the follow-up interviews, it emerged that ‘CreateCal’ was understood differently by different users. 21 out of 57 (36.8%) people from both companies replied that they were using GCS, but from the follow-up interviews and through analysis, it became apparent that GCS performed multiple functional roles in these organizations and consequently there were various understandings of GCS. These can be divided into four types but are not necessarily

exclusive to each other. Firstly and foremost, GCS was perceived, as a 'project calendar', secondly, as a personal electronic calendar and thirdly, as a departmental calendar, which displays information on holidays, team schedules and public information etc. Finally, it was considered to be an administration tool between manager and secretary. The problem may have been that people appeared not to read the explanation of the definition of GCS given in the introduction of the questionnaire.

21 people who said that they were using GCS might have been using it for reasons other than sharing their calendars with others to enable scheduling automation. This leads to an investigation of the assumption that a person in these case study sites may use GCS as a personal calendar artefact, possibly as a paper calendar replacement without realizing that his/her calendar is in the public domain, being published to others and yet answer 'yes' to GCS use.

The findings of the follow-up interview study revealed that GCS was understood largely as a project calendar. This might also help to explain why there was a high level of perceived effectiveness of 'CreateCal' in departmental and organizational levels. The function of GCS as a project calendar is mainly to coordinate a project by giving out information on who is doing what and the task's deadlines. However these do not appear to equate with the general purpose of GCS that allows users to share their calendars with others even though the project calendar usage is still satisfying part of the GCS functions, meaning that it still provides a means to communicate and share information on project associated activities amongst people. One of the interviewees, Sam (pseudo-name) from 'CLA' explained how GCS acts as a project calendar. He explained that when there is a project, it provides information on the team members so that when facing difficulties in a particular area of the project, they can easily find a suitable person for help. GCS is also offering a timetable of the individual tasks of the project so that the activities can be coordinated. It is acting as a central information repository so that relevant people who are bounded by the project can use it for the purpose of completing the project. This agrees with the previous GCS literature which recognized the role of GCS as a 'distributed information system' (Palen, 1998, 1999) or as a 'repository for an organizational memory' (Palen, 1999; Blandford and Green, 2001).

Consequently, its various usages and understanding of GCS revealed ambiguity in the definition of GCS. The ambiguity not only drew attention to the viability of the questionnaire method but also it implied that GCS was multi-faceted software that requires great care in its examination. This primary insight led to the further work of identifying and establishing calendar relationships based on different understanding and usage of GCS as a first step towards the investigation of the attributes of GCS and their interrelationship.

4.2.4 Stage one analysis: GCS as a surveillance tool

With GCS as a project calendar, the limited usage that was found could be closely related to the perception that people have of GCS as an electronic tool that monitors their use of time. The analysis of the study suggests that the underlying perception of GCS was that of ‘Panopticon’ or ‘all-seeing place’ such that privacy and trust play significant part in adoption of GCS. This is discussed further in section 6.4.2.

One of the IT technicians, who ran the internal training, described privacy as underscoring the general perception of GCS. One of the first reactions he received when he explained one of the functions of GCS, its ability to show one’s availability to others, was resistance (TEXT BOX 4.1).

TEXT BOX 4.1

IT technician ‘A’ (‘CLA’)

In fact, I thought it was a good idea having ‘free time’ (function) but others were looking at it from a different angle and they were thinking that it could be used as a surveillance tool for managers.

The IT technician reported that people were concerned about the fact that there was a possibility for managers to access subordinates’ calendars. The underlying concern was that if one’s calendar is seen to be nearly empty, then it could be understood as not being diligent in doing the job or being an inefficient worker, which will count against them when applying for a promotion in the future. The underlying theme of the culture in these organizations was that it was important to be ‘seen’ doing the companies’ work. Corroboratory evidence was supplied by the other interviewee who

shared the same viewpoint that GCS could be used as a surveillance tool (TEXT BOX 4.2).

TEXT BOX 4.2

IT technician 'B' ('CLA')

A long time ago, the manager was sitting at the back of the office so if I am sitting this way (points the direction ahead) the manager is looking at the back of my head. It feels really bad. He is watching what I am doing all the time. You can't look back to see whether the manager is watching you or not. The thing is that GCS has this connotation. It is good if I am a manager to see what employees are doing but if not, it feels really bad.

This agrees with the previous literature work which saw the privacy issue as one of the major concerns for academics as well as GCS designers. Ehrlich (1987a) called for the need for control over who has access to scheduling information as she recognized the possibility of misuse of the available information. Palen (1998, 1999) has introduced some measures that could be used to protect one's privacy in the GCS environment and argued that privacy is an issue that should be resolved for a successful adoption of GCS.

4.2.5 Stage one: suggesting a direction for the next stage

There are provisional propositions that could be made at this stage towards different calendar relationships within GCS. Analysis found that the main GCS usage was as a project calendar to monitor the progress of a project and to use as a project information repository. This particular aspect of usage can be explained because of the perception that some people have of GCS that it was a surveillance tool. Further analysis revealed that a working environment of these two case study sites does not permit 'temporal autonomy'. Palen (1998) explains 'temporal autonomy' as the control that a person possesses over their work time. If one has a 'temporal autonomy', it means that he/she will be able to take some time off during 'working hours' for personal events without worrying about anyone else as long as they are in control of their responsibilities at work. When people work under a rigid time frame, their work is evaluated within this time frame. These circumstances highlight the perceived role of GCS as a time log suitable as a surveillance tool for managers. This has significant GCS adoption

implications which prompt the question, ‘what mechanisms are used by people to overcome the perception of, and its possible usage of GCS as a surveillance tool?’

The analysis of the findings helped to further refine the research direction, as it now appears that there is some ambiguity involved in definition of GCS in our current understanding. The analysis uncovered that there were different calendar relationships existing within GCS. This thesis proposes that what is required to be examined in GCS is the need to establish a finer categorization of detailed calendar relationships. Consequently, the questionnaire method was deemed no longer suitable for studying the GCS attributes, as these attributes are directly related to the dynamic social environment that GCS are used in (see section 3.4.3). In the next stage of pilot study, in-depth interviews were conducted to explore the phenomenon of GCS.

4.3 Stage two: towards the classification of calendar relationships

The provisional and principal findings of the stage one pilot study, when analysed, revealed and confirmed that there is indeed a lack of understanding of GCS currently given in the literature. Pilot study one discovered that there might be different sets of calendar relationships that exist within GCS. This would have implications for design, implementation and for our wider understanding of the usage and temporal coordination of GCS. It was at this stage decided that it would be profitable to ascertain a deeper understanding of these, rather than extend or widen the scope of the enquiry. The main aim of this stage of the pilot study was to reach an understanding of what differentiated these calendar relationships. In addition to establishing classification of GCS calendar relationships, it also aimed to explore further the relationships between calendar and its social setting through the study of GCS usage.

The second stage, in-depth semi-structured interview study was conducted and when it was permitted, the copies of paper calendar and GCS were collected to supplement the interview data. The thirteen interviewees were from six different organizations which varied from an academic institution to one of the major telecommunication company in the U.K. (TABLE 4.2). Conducting interviews with people from various organizations and backgrounds was necessary at this stage firstly, to see if the

attributes of GCS can be found in these widely varied domains and secondly, to explore the calendar characteristics of GCS to confirm one of the findings of pilot study one which was the ambiguity of definition and understanding of GCS. Enough data as produced to be able to construct a first level analysis to confirm the findings of pilot study one and validate the research design for the further case studies.

TABLE 4.2
List of interviewees

Total	No. (person)	Positions	Organizations	GCS
	1	Marketing Communications Manager	IT company	User
	1	Business Analyst	IT company	User
	1	Staff (Product development department)	Telecommunication company	User
	1	Staff (Information management department)	Airline company	User
	2	Senior lecturer who has a personal assistant	Academic institution	1 user and 1 non-user
	2	Personal assistant	Academic institution	1 user and 1 non-user
	1	Senior lecturer	Academic institution	Non-user
	4	Lecturer	Academic institution	3 users and 1 non-users
Total	13			9 users and 4 non-users

Some degree of flexibility and versatility had to be considered in the research design in that the questions had to be broad enough to facilitate a range of answers, taking the diversity of the interview subjects into account (see APPENDIX B.3). For manager and secretary, there had to be additional questions due to their particular working relationship for example, the secretary supports the manager's calendar and therefore the secretary's primary calendar interest is in the managers and not in their own. This is a very different relationship than say, the business analyst or lecturer (see APPENDIX B.4).

There were nine GCS users and four non-users. Interviewing non-GCS users was considered important in this stage for two reasons (see APPENDIX B.5). Firstly, it was to support the finding from the first stage which suggested that GCS was used as a personal calendar. Consequently, it was necessary to study such calendar usage in order to construct the characteristics and see if these could be found in GCS.

Secondly, studying non-users could provide a valuable insight into the attributes of GCS. For example, through the study of the perceived adoption barriers such as unwillingness to change calendar habits, a multi-dimensional perspective of the attributes of GCS could be established even though the interview study was not focused on uncovering GCS adoption barriers per se. Studying GCS users and non-users led to an examination of the GCS attributes within a wider calendar usage which helps to position it in relation to the context of calendars in general.

4.3.1 Interview data analysis

The analysis of this stage was achieved using a pattern matching technique (Miles and Huberman, 1994) (see section 3.5.2) with an adapted grounded approach as discussed in section 3.5. The interviews ranged from 20 minutes to 1 hour in length. The aim was to capture as much of the calendaring work practice detail as possible in order to determine the attributes and boundaries of the categories in the different calendar relationships, through the study of a wide calendar usage. Nine GCS users were using two different GCS products. Among the nine GCS users, six of them had open view settings (showing the content of the calendar) and three had free and busy view settings. All but one stated that their working environments cater for flexible working hours. It was important in this stage to explore the diversity of settings in order to gain a general view of GCS-in-use. All the interviews were taped and transcribed.

The transcribed data was analysed through iterative reading and the practice of coding (Miles and Huberman, 1994) for example the classification frameworks of functional characteristics and GCS attributes were applied to the nine GCS user data set for coding which enabled identification of the calendar relationships. The example of the GCS users' data analysis is presented below (TABLE 4.3).

TABLE 4.3
Example of the GCS users' data analysis

A	B	C	D	E	F
P3-37	Do it once in the morning when I come into work to refresh memory, what my days are going to be like or I know that if I have something early in the morning so I do it a previous night before I go home...	Reminding future event for oneself (a GCS acting as a memory aid)	Supporting Personal Calendaring	-	Individual calendar relationship
A Data location B Data C Characteristics D Functional characteristics E GCS attributes F Calendar relationships					

In terms of the four non-user data set, through the iterative reading, characteristics have been identified. These were compared and contrasted with the findings of the GCS users in order to categorize calendar relationships in GCS and enrich the characteristics of GCS attributes. One of the main characteristics revealed in the study with GCS non-users is discussed in section 4.3.4. An example of the non GCS users' data analysis is shown below (TABLE 4.4).

TABLE 4.4
Example of the non GCS users' data analysis

Data location	Data	Characteristics
P10-25	Paper is very simple, I want to find November, I'm there and I want to write something and cross it out, annotate it, it's very simple technology, very flexible, it allows me doing things in different ways.	Flexibility, Ease of use, Idiosyncratic, Individualistic

The next three sub-sections discuss the findings of pilot study stage two: firstly, dynamism in GCS-in-use from two opposing attributes, secondly, GCS and its social setting and finally, classification of three calendar relationships.

4.3.2 Stage two analysis: dynamism in GCS-in-use

The stage one finding prompted the question; 'what mechanisms are used by people to overcome the perception of and its possible usage of GCS as a surveillance tool?' This

question emphasizes the need of investigation into a phenomenon of dynamic GCS-in-use. When GCS acts as a surveillance tool, individual privacy and trust between management and subordinates are challenged as GCS requires the handing over of one's control over his or her time. This section reports on the issues of privacy, trust and temporal control attributes and the mechanism that allows a critical mass of users to be achieved, necessary size of the users for system to be utilised and achieve its purpose. It was recognized that it would be beneficial to enquire into the early stage of GCS adoption to understand the effect of the perceived role of GCS as a surveillance tool however, examination of the early stage adoption is an outside of the research scope of this research.

The following data analysis presents the opposing perspectives between 'privacy', 'trust' and 'temporal control' attributes on the one hand and the 'gaining a critical mass of users' attribute on the other as in order to gain a critical mass of users, it requires individuals to comply with the need of the group.

'Privacy, trust and temporal control'

It was clear from the analysis that the majority of the interviewees were working in organizations where there was latitude of use of time. The marketing communications manager described that her company was "*compassionate*" and had a "*very good human resource policy*". She gave an example of the flexibility in her working hours that she would block her calendar to meet her needs (TEXT BOX 4.3).

TEXT BOX 4.3

Marketing communication manager (IT company)

...if I was at home and if I don't want anyone to schedule a physical meeting with me that I have to attend, I just block it off.

An interviewee from an airline company described his GCS usage in a flexible working environment (TEXT BOX 4.4).

TEXT BOX 4.4**Staff (Airline company)**

...also for any other events, social events, especially my company encourages you to write events like social events outside of the work. For lunch time meetings, you put that in as well...sometimes I put football match in there. I am not supposed to take two hours lunch break for a football match but the supervisor, she knew that and it was fine so I just put it in my calendar.

This was accompanied by a view below given by an interviewee from a telecom company. He considered the working hour as the time that belongs to the company that he works for and therefore he is obliged to reveal his time usage to others (TEXT BOX 4.5).

TEXT BOX 4.5**Staff (Telecom company)**

As long as you are not doing too much personal stuff at work, it is not really a problem. It's only when you have a problem to hide or worry about becomes an issue...there is an element everyone knows what you are doing, working as a part of a team shouldn't really matter and information should be available anyway.

However, the marketing communications manager who uses a free/busy view setting of GCS unlike telecom and airline companies disagreed with having an open view setting (TEXT BOX 4.6).

TEXT BOX 4.6**Marketing communications manager (IT company)**

Why? Why do you need to know what they are doing? I really don't need to know, I schedule a meeting with twelve people, I don't really care what people are doing. All I want to know is whether they are okay for the meeting for a particular time.

The conflicting views on GCS view setting highlight the issues of individual privacy, trust and temporal control in GCS that requires a deeper understanding. The interviewee from a telecom company recalled an incident that was brought about due to having an open view setting (TEXT BOX 4.7).

TEXT BOX 4.7**Staff (Telecom company)**

I think once, one of the managers put in email, discussing redundancies with certain people. He wanted to invite them to talk about that. And because invites went into his calendar, anyone who accessed his calendar could see the invites, could see the contents so, that was pretty bad.

In these organizations, the flexible working environment provides an ‘ideal’ setting for GCS. For example, it is because working hours are flexible so that people appropriate GCS to rearrange their working hour/day by blocking some time off. However, privacy is still an issue as seen in the above text boxes 4.6 and 4.7. Consequently, it needs further investigation to assess its implications in GCS temporal coordination.

‘Gaining a critical mass of users’

GCS was in use in all of the business sector companies, predating the interviewees’ employment. A marketing communications manager from an IT company explained how she started using GCS (TEXT BOX 4.8).

TEXT BOX 4.8**Marketing communications manager (IT company)**

...you know it’s unspoken, nobody has told you that you have to use it. It’s just that a lot of people use it so if you don’t use it, you are the minority and if you are minority, you are left out and it’s also difficult for you. When I first joined the company, I didn’t use it, I didn’t know to how to use it. I didn’t know there is such a thing you know, it’s not something that it’s in a manual that you have to use it, you just get to know. Enough people use it and you say to yourself, ‘okay I better use it’ otherwise I will be a ‘bottleneck’; you know (laughs) I will be a problem. So I would use it all the time.

Using GCS is part of an established working practice which implicitly demands and creates conformity among the members in the group. This leads to maintaining a critical mass of users. This was also confirmed by an interviewee from a telecom company (TEXT BOX 4.9).

TEXT BOX 4.9**Staff (Telecom company)**

...if you don't use it, you wouldn't really survive because you wouldn't be able to, you wouldn't know when the meetings are, you wouldn't know where you are meant to be and when, you wouldn't be able to book meeting rooms, you wouldn't be able to track people, find people, find out where they are, what they are doing, there was no pressure initially but you wouldn't really survive if you don't use it.

He continued to explain the significance of GCS in his working practice. This presents the embeddedness of the organizational practice in his daily activity (TEXT BOX 4.10).

TEXT BOX 4.10**Staff (Telecom company)**

...if it wasn't there I don't know how I would function, it's one of these things you take for granted but it's probably when you think about it in retrospective actually it's quite, it's quite, it's fundamental like using your word processor, definitely.

The above examination showed the relationship between the 'privacy', 'trust' and 'temporal control' attributes on the one hand and 'gaining a critical mass of users' attribute on the other in the organizations. It appeared that the organizational conformity was acting to encourage and retain the critical mass of users. This relationship needs to be further investigated using an in-depth case study specifically focusing upon a group perspective and its GCS usage in order to capture the dynamic interrelationship of these attributes.

The next section discusses socially embedded scheduling activity and its implications for GCS.

4.3.3 Stage two analysis: scheduling, socially negotiated activity

The study analysis highlighted and confirmed that scheduling and rescheduling activities constitute a large part of calendar activity. In section 2.2.1, characteristics of scheduling were discussed in an attempt to understand and clarify the workings of the

calendar. The schedule is firmly based upon the concept of social conventions rather than our biological needs. It is this conventionality of the schedule that generates the socio-temporal order in society. The conventionality of the schedule through the repeated action of scheduling emerges as the social pattern, recognisable for Berger and Luckmann (1966) as ‘habitualization’, that ‘all human activity is subject to habitualization’.

Taking the perspective that scheduling and rescheduling is a social contrivance, ‘habitualization’ facilitates a particular research perspective from which to analyse the interview data. As an example, the analysis of the interviews with the GCS non-users, personal assistant, the managerial staff and the subordinate in the academic organization revealed that scheduling and rescheduling is highly contextual. In this organization, rescheduling occurred frequently, due to calendar conflicts but it did not seem to be a cause for concern, either for the manager or the secretary. The analysis revealed that the affected parties socially recognised and readily accepted that there was a rescheduling process. This was evident in the replies when they said that ‘*people understand*’, that ‘*they are busy*’, ‘*it is minor*’, therefore, these rescheduling activities did not appear to cause much of a problem, reflected in the comments made by the Manager (TEXT BOX 4.11).

TEXT BOX 4.11

Manager (Academic institution-non GCS user)

It (the calendar conflict) is quite often and easy to rearrange because ...a lot of my meetings are with individuals and most individuals I meet are used to the fact that my diary is very agile.

For managers and the secretaries, there is no major concern in this process since the secretaries are responsible for most of the rescheduling activity and are acting as gatekeepers and representatives to negotiate with the other parties. The secretaries control the communication access and manage time according to a priority, based on social hierarchy (TEXT BOX 4.12).

TEXT BOX 4.12**Secretary (Academic institution-non GCS user)**

If it is anything to do with VC (vice chancellor) obviously people in university who are very important in hierarchy, a VC or a dean that overwrites most of things so obviously lecturers have to realise that, that comes first...

One of the interviewees who experienced the rescheduling remarked on the hierarchical aspects of meeting arrangement (TEXT BOX 4.13).

TEXT BOX 4.13**Staff (Academic institution-non GCS user)**

...we arrange the time but it tends to be done in an autocratic way, not in a very democratic way.

The rescheduling activity described above demonstrates how calendar use highlights the hierarchical relationship in an organization through the prioritisation which represents the status based on the structural hierarchy of the organization. The calendar usage and the calendar artefact represent a hierarchical relationship which is highly dependant upon local contingent circumstance of the organizational arrangement of work practice. The general finding to take forward from the analysis is that people arrange meetings in the organization by the operationalization of the socially negotiated process, using learned norms which are heavily dependent on roles and positions within the organization.

This social hierarchical practice is one of the interesting aspects to observe in the further case studies to see how the social hierarchical practice is exercised when GCS cross the social boundary to mediate scheduling. This practice signifies that it is a transition of a scheduling action from socially embedded to a technologically systemised one. Previously, scheduling activity was heavily dependent upon verbal communication, using facial and body gestures and language to agree and make a decision on the time and place whilst all the calendar related information is held privately by both parties. However, in GCS, private information is being 'forced' to become public. The disclosure of the private calendaring activities is a necessary

requirement so that a predefined computer environment can process the calendar information of both parties and generate the schedule for two or more people. The implication of this suggests that GCS has to support such interactions and negotiations between people in order for it to act as ‘a medium of social interaction and communication’ (Ehrlich, 1987a; Palen, 1998, 1999; Tullio, 2002).

4.3.4 Stage two analysis: three calendar relationships

The interview study with GCS users and non-users helped to identify the GCS attributes and position it within the wider calendar relationships. The study of GCS relationships are based on calendar to calendar, users to calendar, and calendar to its operational environment. The categories of calendar relationships of GCS are composed of; ‘individual calendar’, ‘central calendar’ and ‘collaborative calendar’. The next section explains categorization of calendar relationships of GCS based on the detailed study of in-use in a social environment and their interrelationships.

4.4. The implications of the pilot study: GCS Classification

From the analysis of the data, the usage and the perception of GCS from organizational as well as individual perspectives indicated that there are three calendar relationships, each consisting of distinctive characteristics: ‘Individual Calendar Relationship’ (ICR), ‘Central Calendar Relationship’ (CCR) and ‘Collaborative Calendar Relationship’ (CoCR). All of these relationships are imbued with perspectives of social relationships operating from and within the context. These attributes are the results of the practice of calendar ‘in use’. These interrelated and yet, distinctive attributes highlight the existence of different processes of calendar-in-use. These three calendar relationships are discussed below.

4.4.1 ‘Individual Calendar Relationship’ (ICR)

The interview study of both GCS users and non-users found that ‘ICR’ relies on individual calendar practice and uses both synchronous and asynchronous interaction. The study of the non GCS users sought to understand the activity and the calendar relationship to the users so that it could inform the study of ‘ICR’ of GCS. The ‘ICR’ exists where a person actively decide to engage in calendar activities in order to

manage their own calendars, such as appointment making and planning future events using various mediums such as paper and electronic. The calendar is seen as a privately owned artefact and each party does not necessarily see each other's calendar because they are considered as personal artefacts, exclusive to the owners, containing and maintaining the owner's privacy. The function of the 'ICR' is to support scheduling activity, to remind the user of future appointments and to act as a private memoir for reminding of previous events. The usage can be characterised as idiosyncratic that there is no fixed format or convention to follow, which all depends on personal calendaring habits and preferences. The sole responsibility lies on the user to keep it up to date and maintain it.

The process of scheduling is bounded by and entirely dependent upon the shared norms in political, social and economic environments. The process involves interactions between parties based on social negotiation. The scheduling process is fixed in time and space unless aided by a communication mechanism such as email. The communication format of the scheduling process can take place ranging from face to face to over the internet through an unstructured socially negotiated activity. Consequently, it is a fluid negotiation where people use social rules and norms. The negotiation used is context dependent as each relationship is different and extends over time. For example, a personal entry for a calendar for an initial contact may well be business like but over time, the relationship can change to an informal social contact.

4.4.2 'Central Calendar Relationship' (CCR)

The 'CCR' refers to a calendar, commonly found on office walls. It is used to publicise the organizational calendaring activities, such as staff holidays, public holidays, festivals and project scheduling. It is located in a defined appropriate public area, a place that everybody has convenient access for viewing. It is a context driven calendar for the purpose of publicising information driven by the events. It is referred to as a quick reference calendar for people who are associated with the event. In this way, it specifically caters for the needs of an organization or a group. It uses agreed symbols and a language that the bounded group can understand. Consequently, it could be used as a mechanism for grouping people. The publication of the calendar

marks the end of a socially negotiated activity. It is considered to be closely associated with scheduling activity, managed by a process of input and output with a minimum social negotiation and the output is recognisable as timetabling.

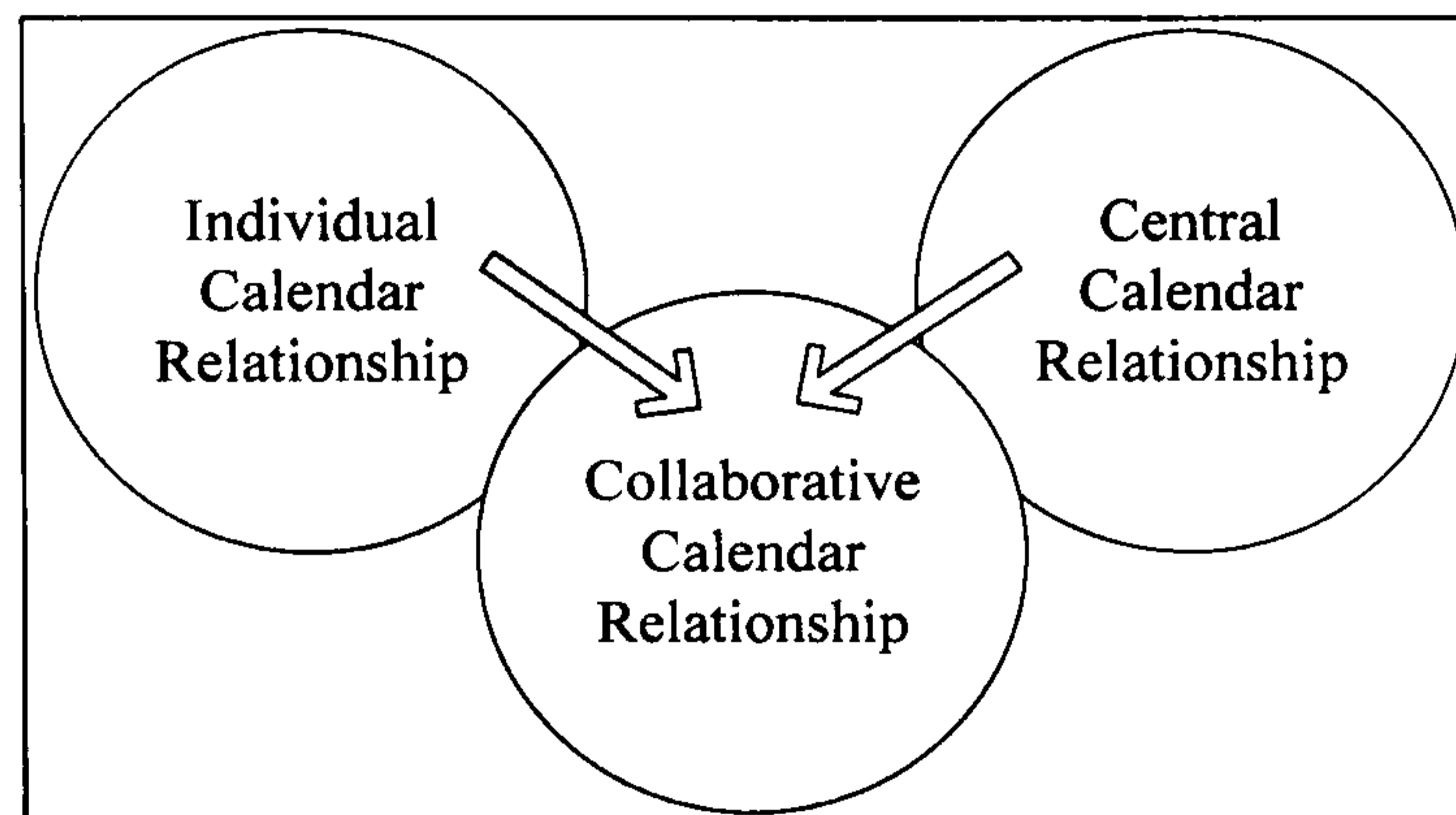
A surprising variant of the 'CCR' is found in the relationship of the manager-secretary calendar usage. A typical relationship between a manager and secretary is where the secretary represents the public face of the manager's calendar, as a go-between to negotiate with people inside and outside the organization. It can easily be seen as 'CoCR' due to the interaction between the manager and secretary. However, it is only one calendar which belongs to the manager that is managed. The actions the secretary performs in representing the manager's time is as an agent, screening, timetabling and managing the appointment process and in doing so, draws upon the structural hierarchy of the organization, and the localised working interrelationships. For the manager, the calendar is public for his/her secretary but private outside of this relationship. The manager's appointments are open to negotiations by the secretary, in that the secretary has a social position to be able to manage the manager's time and manages time for the organization by virtue of his/her position of dominance according to the organizational norms. The interconnected 'manager's time' and 'organizational-time managed' ensure that managers are able to control time related relationships, implicitly by inference 'my time is more important than your time' and explicitly by making demands upon other people's time.

4.4.3 'Collaborative Calendar Relationship' (CoCR)

'CoCR' is where two or more people are bounded by the mediation of a networked calendar system. The group of people use a predefined relationship bounded by the system. Group members 'place' their calendars on-line, sharing their calendars with everyone of the group in order to automate the scheduling process. The communication is technologically enabled and mediated by the functions of software. As the process of calendaring is bounded by the system, it removes the social context and imposes the defined situated social order, structured negotiated activity. The 'deviation' in the operationalization of GCS using socially negotiated activity is due to the users who appropriate the system by working around it, as seen in the text box 4.3, (in section 4.3.2) or integrate the system into their existing working practice.

If we take the stance of asking what GCS is about, ‘CoCR’ is the one which implies the marriage of the characteristics of ‘ICR’ and ‘CCR’ calendar relationships as shown on diagram 4.1.

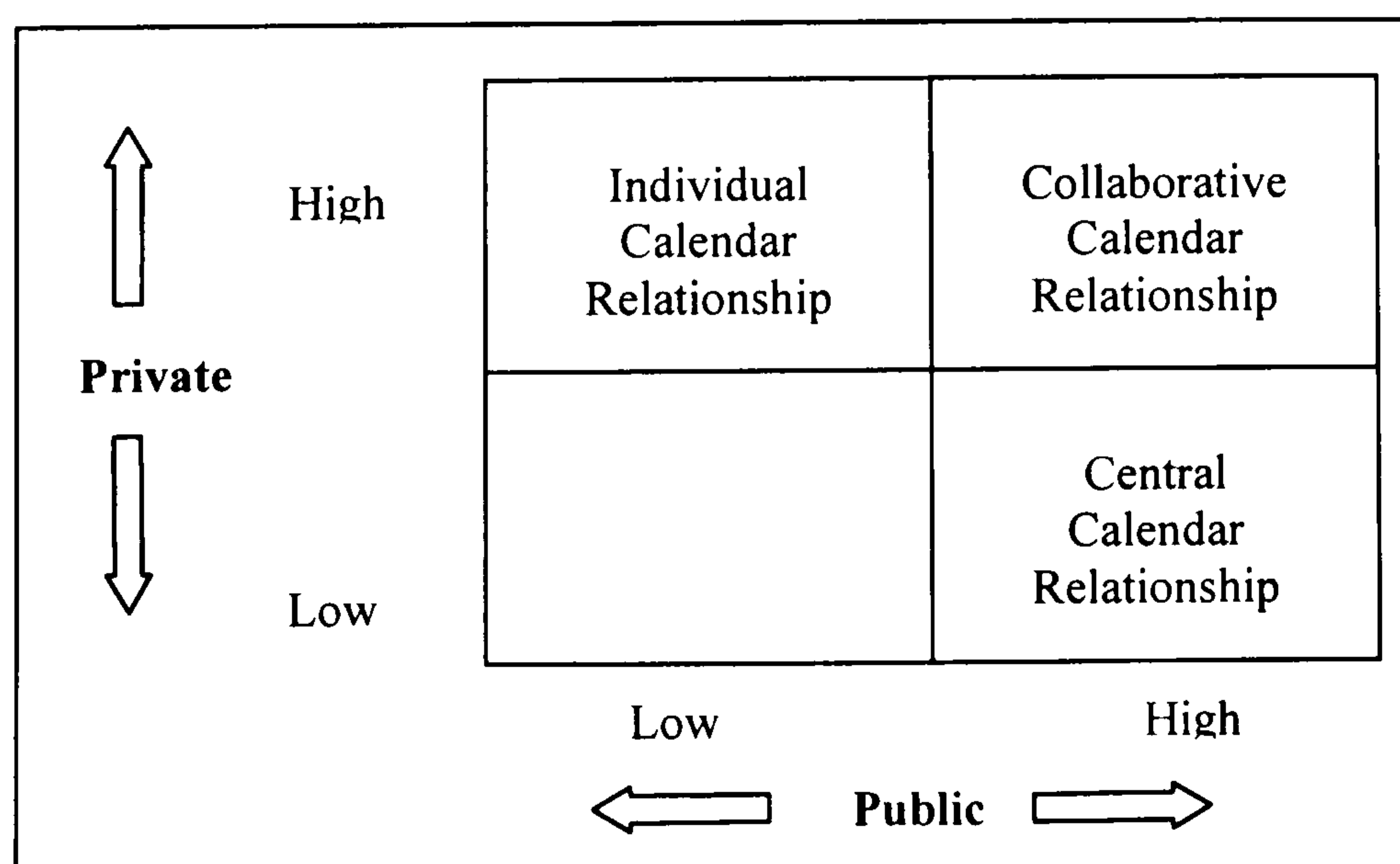
DIAGRAM 4.1
Three calendar relationships



4.4.4 Three calendar relationships: discussion

The classification was made in an attempt to recognize the diversity and complexity of GCS through the study of GCS usage and the user’s perception of it. However, the boundaries between these three calendar relationships remain ambiguous, seemingly overlapping in terms of their fundamental calendaring activities. The distinction between them becomes clearer when we examine some of the dimensions such as its usage and scheduling process. For example, despite some of its overlapping attributes, the mechanism of the scheduling activity can be used to highlight the differences, especially between the ‘ICR’ and ‘CoCR’ (see DIAGRAM 4. 2).

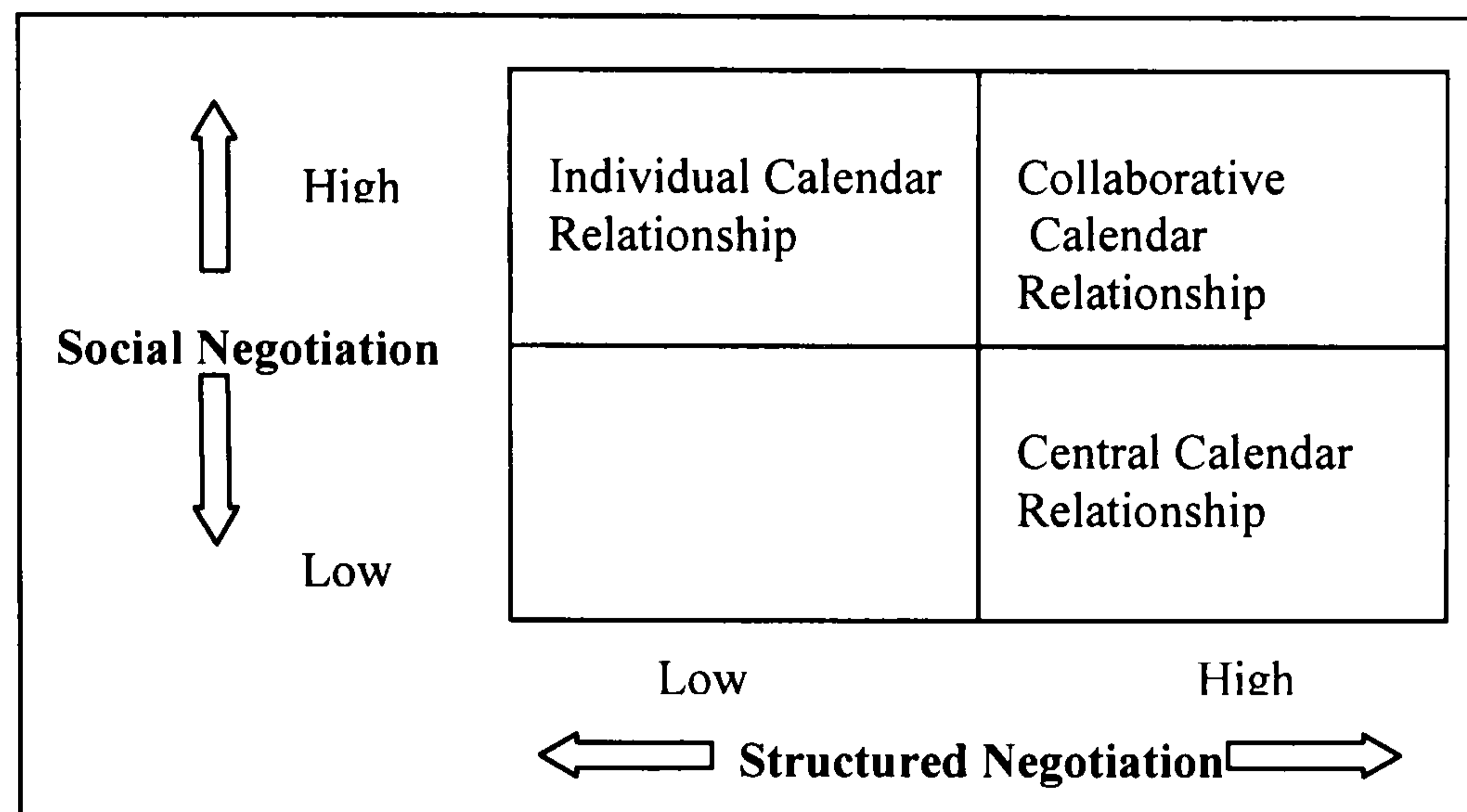
DIAGRAM 4.2
GCS Calendar relationships matrix



The classification of calendar relationships of GCS is important because by distinguishing the calendar relationships according to their characteristics and the processes we then understand the workings of GCS temporal coordination. For example, the classification of three calendar relationships above highlights the co-existence of the conflicting private and public perspectives in GCS. ‘Individual Calendar Relationship’ (ICR) highlights the private aspects of GCS and yet, ‘Central Calendar Relationship’ (CCR) places GCS in the public domain. ‘Collaborative Calendar Relationship’ (CoCR) addresses GCS somewhere in between, bridging the private and public perspectives of GCS. Of note, here is the transitional problem, however, when ‘ICR’ becomes incorporated into GCS, systematised process, GCS has to be able to deal with the unexpected large diversity in usage (Kelley and Chapanis, 1982) and also recognize the concept of publicising private calendar in a public forum and the changing social relationships as a consequence. The collaborative aspects of calendaring needs to be highlighted here as requiring further investigation, to be carried forward to the next chapter as it bridges ‘ICR’ and ‘CCR’ in the process of temporal coordination of GCS.

This firmly positions the conflicting private and public perspectives as a dimension of GCS. ‘ICR’ is characterised by a dynamic and fluid relationships and is reliant upon processes that are heavily dependent on who, when, what, where and why. Whereas, in ‘CCR’ and ‘CoCR’, users find themselves in an environment where the process of arranging meetings has been fixed and pre-defined, resulting in a different scheduling activity with minimal social interactions. The private and public interrelationship can also be distinguished as ‘socially negotiated activity’ and ‘structured negotiated activity’. This dimension has been placed into a matrix as shown below in diagram 4.3 to demonstrate social and structured negotiation at work and also the interrelationship of three calendar relationships.

DIAGRAM 4.3
GCS negotiation matrix



4.5 Summary

This chapter reported on the main findings of the pilot study as a first step towards the investigation of GCS temporal coordination. The general finding of the pilot study indicated that a more detailed analysis of GCS-in-use was required to help further understanding and to sharpen the detail of the research question. The pilot study was structured in two stages; one consisted of questionnaires and follow-up interviews, and two, a series of in-depth interviews. In the first stage, GCS was found to be understood and perceived differently by users and also was widely considered to be a surveillance tool for the managers. This initial finding established a foundation from which to reconsider the research direction and the understanding of the social implications of GCS-in-use.

The in-depth interview studies in the second stage identified and established through analysis that there were in fact three calendar relationships within GCS: 'Individual Calendar Relationship' (ICR), 'Central Calendar Relationship' (CCR) and 'Collaborative Calendar Relationship' (CoCR). The work of this chapter formed an initial classification of calendar relationships, forming a foundation for examining the processes and interrelationships of the attributes of temporal coordination in GCS. This categorization revealed that there is a need for further investigation into the phenomenon of process of temporal coordination which is achieved on a dynamic interrelationship between the conflicting private and public perspectives.

The other finding to emerge from stage two was that; calendar activity was primarily based on a socially negotiated activity, further, these relationships were subject to constant negotiation in scheduling and rescheduling activities using accepted locally produced norms. This highlights the challenges that GCS adoption is facing in that the design of GCS has to be able to cater for such socially negotiated activity and also the dynamic social environment for it to gain a critical mass of users. The findings of this chapter framed by the research strategy of semi-structured interview questions initiated two further in-depth case studies in the following Chapter. The aim of Chapter 5 is to confirm and refine the findings established in this chapter that is, to explore further the understanding of the dynamic interrelationship of the conflicting private and public perspectives thereby leading to the process of temporal coordination.

CHAPTER 5

Case studies: the process of temporal coordination

5.1 Introduction

The aim of this chapter is to make conceptual and theoretical coherence (Miles and Huberman, 1994) to investigate the GCS practices further. It firstly, confirms and builds upon the findings in Chapter 4 and secondly, develops the central theme, the conceptual framework of the temporal coordination processes of GCS.

Section 5.2 explains the case study selection and analysis processes. The sections of 5.3 and 5.5 begin with the description of the case study site with some of background information about the collected data and the collection methods. These sections are then followed by discussion of key examples of general findings that characterise each case study. This led to a foundation and construction of section 5.7. where the analyses of the case studies are concatenated and described; firstly, positioning of the three calendar relationships in the collected data secondly, a deeper understanding of these three calendar relationships using the GCS functional characteristics, identified in section 2.4.1 and thirdly, some of the social implications of interrelationships and interplays between these calendar relationships in relation to the GCS attributes found in the literature. This chapter then concludes with an introduction of the temporal coordination model based on the interrelationship of the attributes which provides a foundation for the discussion in Chapter 6. The final section 5.8 provides a short summary of this chapter and the implications of the findings.

5.2 Case study selection and analysis

Building upon the previous chapter, two further suitable case study sites were sought and selected: the School of Computer Science in an academic institution, 'SCS' (pseudo-name) and the business organization 'CIM' (pseudo-name). The contrasting differences of cultural and organizational contexts between these two case study sites

are considered to be beneficial to the study of GCS in terms of deepening the understanding of the temporal coordination process.

The study focused on GCS usage at co-located virtual environment and these two organizations were both using the same GCS, 'NetCal' (pseudo-name). 'SCS' is an academic institution and is not the researcher's base. The first case study was 'chosen' firstly, due to the matured usage of GCS, secondly, research accessibility, thirdly, its business management structure, and finally, the flexible working hours practice which is regarded as an enabler of the adoption of GCS (Palen, 1999). The second case study site, 'CIM', a multinational business organization was selected as it had firstly, the potential to demonstrate 'Central Calendar Relationship' (CCR) and secondly, the matured usage of GCS. The analysis of the previous chapter found that 'CCR' required further investigation to confirm the ways in which social hierarchical practice is exercised in GCS environment (see 4.3.3). The research in 'CIM', therefore focuses on the dynamics of the 'CCR' of GCS and its social implications. Both 'SCS' and 'CIM' offer a valuable dimension to the research enquiry as the case studies are being conducted five to six years after the introduction of GCS. In these organizations working patterns and knowledge about GSC have been firmly established. The matured usage of GCS was an important factor in selecting case study sites as the nature of the research question enquires into the 'nature of the temporal coordination of GCS'.

The findings of the pilot study revealed the need for further in-depth case studies to capture the social relationships and other considerations, such as institutional norms and practices, procedures, working relationships and group attitudes that have been built up over time. The research approach utilises a framework of multi data collection methods to deepen the understanding of the phenomenon. Using the revised interview questions of pilot study stage two (APPENDIX C.1), the focus of the questions was directed towards elucidating information on GCS-in-use and to try to avoid excessive passivity and over-direction (Walsham, 1995). Participants were asked to describe their everyday activities (in a "Day in the life of . . ." format), as well as being asked about their appointment making, organizational flows of communication, and key challenges to the introduction and use of GCS.

The pilot study prompted the need to study firstly, GCS usage in a dynamic social environment and secondly, group perspectives and their usage. The framework research design for analysis used a modified SCOT framework (M-SCOT) in order to identify and capture the GCS attributes and their interrelationships. The M-SCOT framework therefore, acts as a refining tool for the issues identified in the literature. It provided a means to organise and analyse interview data. It also facilitated the data presentation through the structured organization of the data in logical diagrams.

The analysis of the data was based on an iterative work between notes, discussed in section 3.4.1 and the original data. The interview data was matched against secondary-source and other data collected, such as internal calendar documents and informal observations as verification. Additional data was also obtained on such as office location and demographics of team members. All the data sets were then organised into a research database (Yin, 2003) ready for analysis. The unit of analysis, for this stage of the research is selected at the group level, focusing upon the roles performed together with their responsibilities for working in the organization and the norms of behaviour that could be established as a general norm of the group. The data sets were collected at the individual level, and then grouped under the research design framework as explained in section 3.5.1 so that this research can examine the institutional norms and behaviour involved in the process of temporal coordination.

Following the procedure of the original SCOT, collected data was grouped into 'RSGs' (Relevant Social Groups). Initially the original SCOT framework was applied to analyse the data however it soon became apparent that the original SCOT framework was inadequate to analyse the technology in-use and the complex social interactions. The analysis started again from the original data set but still used the original framework as a benchmark, the SCOT framework was then modified and tested. When the modification of the original SCOT framework was completed with a new set of keys (see TABLE 3.1), this modified framework, M-SCOT was applied to the whole data. The pattern-matching has been used as an analytical tool to compare and contrast the findings of M-SCOT with that of literature which is presented in diagrams 5.14 and 5.15.

5.3 Case study one: 'SCS'

The data collected in the first case study focused upon semi-structured interviews. The process of the interview included a short questionnaire (see APPENDIX C. 2), completed by the interviewees during the interview. In addition, wider contextual enquiries into calendaring activity were undertaken. The short questionnaire served as a prompt in order to finely adjust the interview questions to elicit clearer information if clarification or elaboration were necessary. In addition to the interviews and the questionnaires, supplementary information was also collected, such as documentary and observational evidence. The documentary evidence collected included; copies of the paper calendars both personal and work related and the print outs of GCS, timetables, copies of email related to the usage of GCS and photographs of the working environment and the interviewees' calendar usage. Photographs helped to locate the artefact in time and space, acting as a reminder to refresh the memory of the researcher during the data analysis. These documents together with observations on the usage of GCS provided supplementary information on interview data. In 'SCS', an electronic survey was also conducted. The construct of the survey was kept in simple, 'Do you use GCS?' with an option to say 'Yes' or 'No' which was sent out via email to all the staff at 'SCS'. The 'voting button' in email has provided a means to capture the number of people who use GCS. However, as the question, 'Do you use GCS?' appeared to have a few variables which are discussed in section 5.4.3, the survey was not conducted at the second case study site. This section introduces the background of case study one and the grouping of the 'RSG'.

5.3.1 Case study background

The first main case study was undertaken within 'SCS' in a UK academic institution. The School has been using 'NetCal' for over 5 years. Within the School there are five divisions and each has a division leader. The five divisions are 'Computer Arts', 'Engineering', 'Information and Communication Technologies (ICT)', 'Mathematical Sciences' and 'Software Engineering'. The interview was particularly focused on the ICT Division due to its accessibility. The School has approximately 57 teaching staff and 50 researchers with 6 administrative staff. The administrative staff are on the same floor in two rooms.

The organization practices flexitime and teleworking. The start and finish times of the working day are open to negotiation and it is an option for working from home for one day a week if they wish, it is a part of ‘accepted’ working practice during the teaching term. A copy of email from the ICT division leader to staff, indicating this flexible working pattern during the summer holiday was also obtained. This is an environment in which it is difficult to draw a clear temporal boundary between teaching and research, the former being controlled by organizational time and the latter being personally organised time. Therefore it was identified as a good candidate for investigation of GCS focusing on the dynamics of private and public perspectives and their interrelationship.

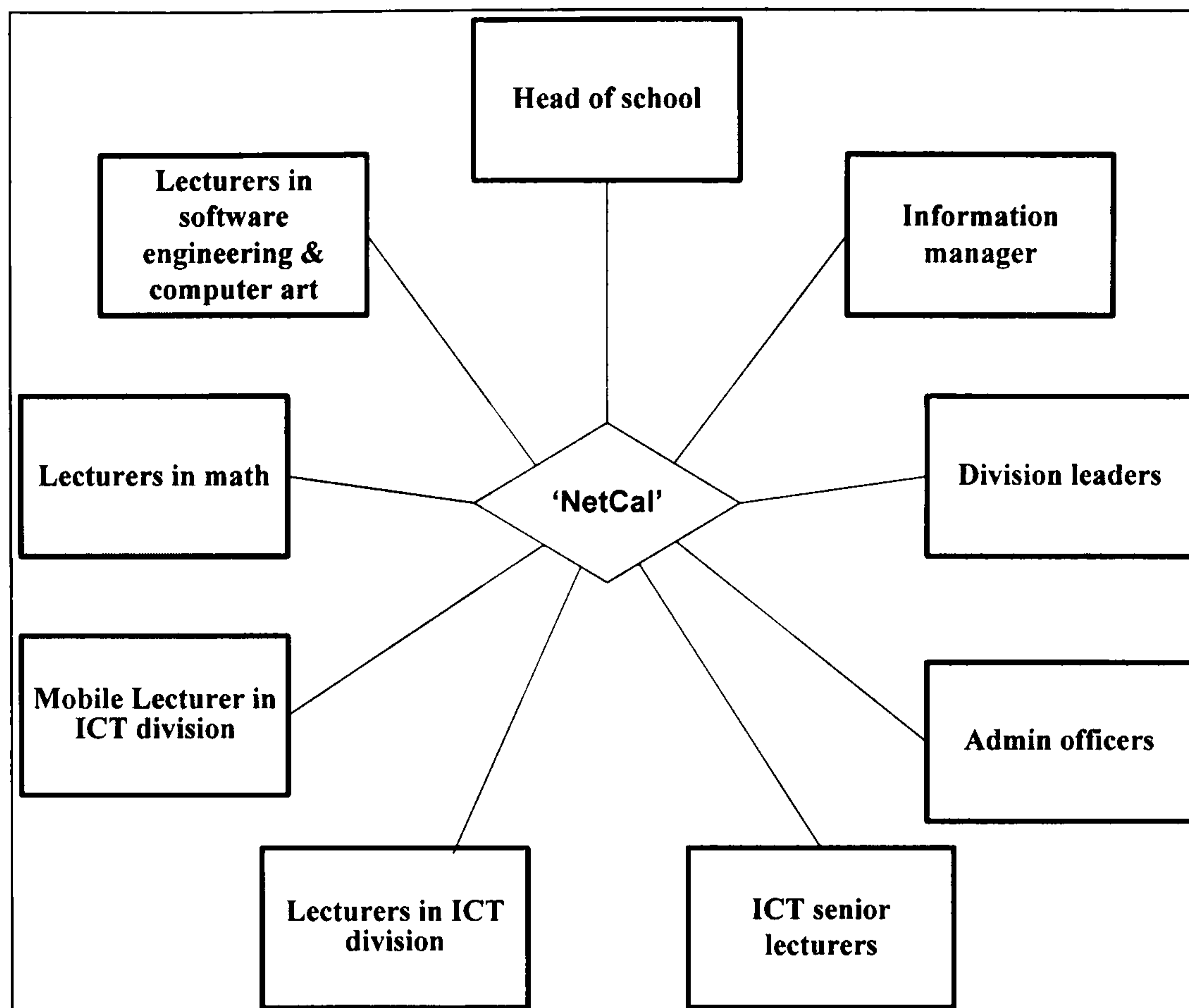
Twenty two interviews were conducted, lasting between 20-30 minutes each. Interviews were conducted with the following people:

- Head of school
- Information manager
- Two division leaders
- Four admin staff
- Nine ICT lecturers
- Five lecturers in other divisions

5.3.2 ‘RSGs’ of ‘SCS’

As a first step of the M-SCOT framework analysis, the interviewees were grouped according to their positions and their roles in the organization using the fact-based background information. The M-SCOT framework analysis identified nine ‘RSGs’ in ‘SCS’: ‘Head of school’, ‘Information manager’, ‘Division leaders’, ‘Admin officers’, ‘ICT senior lecturers’, ‘Lecturers in ICT division’, ‘Mobile lecturer in ICT division’, ‘Lecturers in math’, and ‘Lecturers in software engineering and computer art’ (DIAGRAM 5.1).

DIARAM 5.1
'RSGs' of 'SCS'



As discussed in section 3.3, identifying the social groups within the context of boundary is important, as it has been pointed out that different social groups perceive technology differently and construct different meanings. For example, the role of admin officer is different from the role of the lecturer in the organization, as their duties are different. Their usages and interpretations of the work related software are consequently different. The 'Admin officers' social group would use 'NetCal' fundamentally to support the calendar work of the head of school or division leaders whereas the lecturers use 'NetCal' to support their own calendar work interests. Part of this thesis contention is that these differences are fundamental to understanding temporal coordination as an intersection of private and public perspectives. These differences are crucial to be recognized when studying software usage in order to help to explain the multi-dimensional perspectives. The next section discusses general findings that characterise 'NetCal' usage in this organization drawn from the operationalisation of the M-SCOT framework. These lay a contextual groundwork for section 5.7 where the analysis of the two case studies are combined.

5.4 Case study one: the operationalization of the M-SCOT framework

This section discusses some of the findings that characterise GCS-in-use in 'SCS' to show the way in which the M-SCOT framework was operationalised. Key examples of relevant analysis from the M-SCOT framework are presented here and the complete M-SCOT analysis of all the identified social groups can be found in appendix C.3. The section 5.4.1 discusses the deployment attributes of GCS which provides a historical perspective to help to frame the organizational context of 'NetCal'-in-use.

5.4.1 Transforming the calendar practice

The University strategy to standardise the internal communication system coincided with the head of school's motivation to implement 'NetCal'. Two reasons were given by the head of School for the decision to implement it. Firstly, he wanted to improve work efficiency. From the interviews, it was shown that as a manager he saw that time was 'wasted' when organizing meetings for more than two people who were possibly equally busy. His observation was that time and human resources were unnecessarily wasted as the admin staff had to do the organising of the meetings using the telephone while people were either out of office, lecturing, having a meeting, or had limited free time available. There was a need to improve the processes of arranging meetings and scheduling other activities. The second, equally important reason, he expressed was that there was a need to improve the visibility of the whereabouts of staff, there was a managerial need to know where his staff were. Indicating to a white board in the admin office which showed the teaching hours and who was on holiday, he explained, "...*this is only a fraction of their time...*". The difficulty of locating people and the limited temporal information available to head of school acted as a motive for the implementation of 'NetCal'.

His positive experience with 'NetCal' in his previous work was brought forward and his authoritative managerial position led to the decision of implementing 'NetCal'. It was implemented firstly to the admin staff, then to the division leaders and finally to the rest of the school. The 'NetCal' provided him with the means to improve the efficiency of the admin work and at the same time made the flexible working practice visible and accountable. Before implementing it to the whole school, he sought wider managerial support from the division leaders at a meeting with them (DIAGRM 5.2 M-SCOT framework ⑤). As an incentive, the division leaders were offered handheld

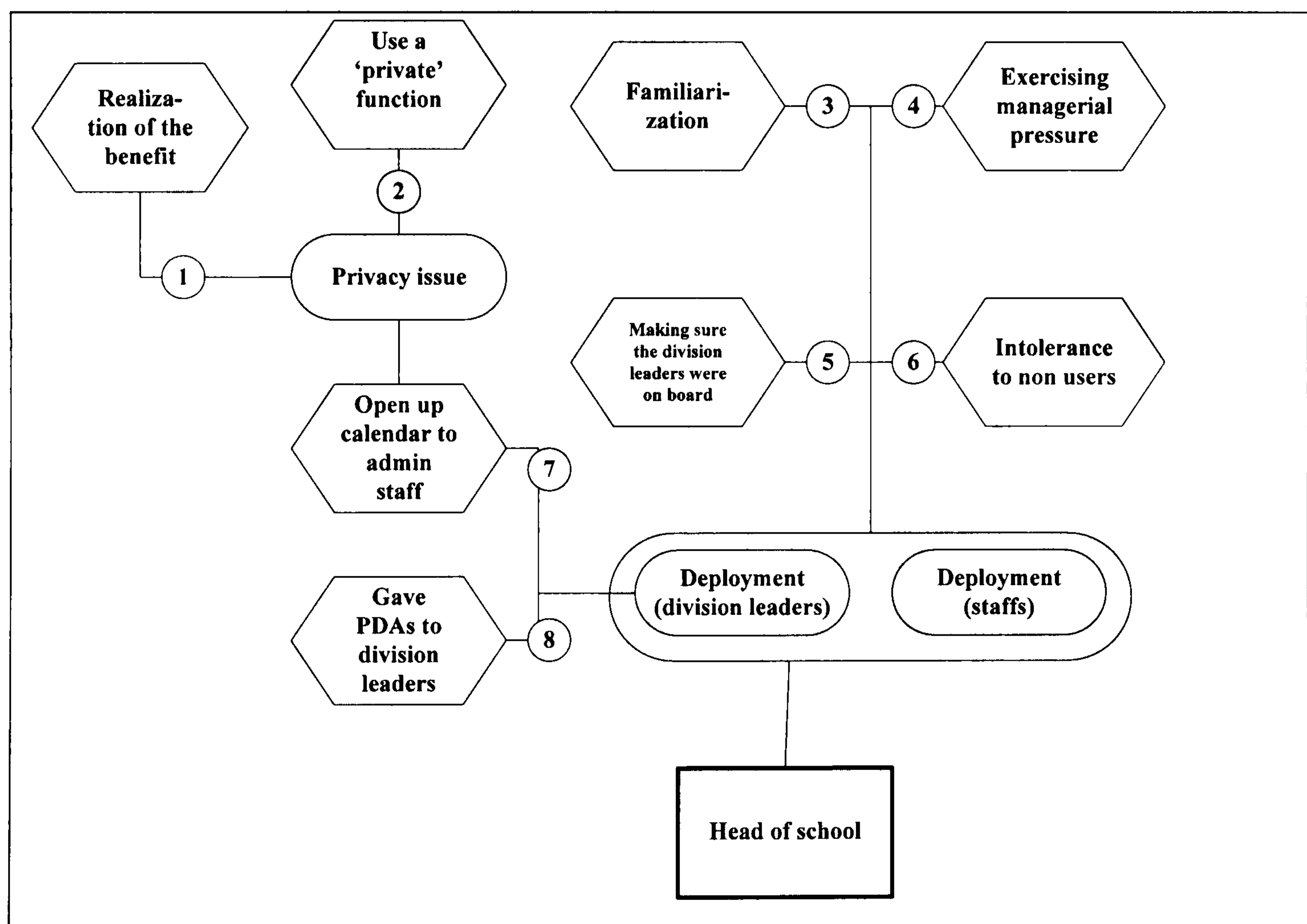
personal organizers so that their 'NetCal', both mobile and desktop could be synchronized. He saw this as a good incentive for the division leaders to take up on 'NetCal' and keep it up to date (DIAGRAM 5.2 M-SCOT framework ⑧). In addition to this, the division leaders and the senior academic staff were offered admin support. By opening up their calendars to the admin staff who would act as intermediators, students and other member of staff's meeting requests could be processed by them. (DIAGRAM 5.2 M-SCOT framework ⑦). The head of school explains, "...that means, you are no longer walking around with these 15 meetings in your head that you are supposed to remember. So they've got reasonable efficiency out of it..." (DIAGRAM 5.2 M-SCOT framework ①).

Some of the division leaders and senior academics staff gave 'write-in' permission to admin staff that enabled them to put appointments in the division leaders and senior academics staff's calendars directly without consulting. The overall effect of the introduction of 'NetCal' for the division leaders and the senior staff was observed to be an increase in the calendar mobility and a reduction of the administrative work. After the decision was made and approved by the division leaders, an email was sent out to the rest of the staff at the school to inform them of the new practice. The head of school acknowledged the difficulty of changing working practice and for that very reason he knew that in order to achieve it, managerial pressure was necessary even though the default calendar viewing was free/busy, "*It (calendar system) is not a trivial application. Getting people to actually adopt a diary system, calendar system is quite hard. Even now I know it is not 100 % used basically because I, as a head of school and everyone's line manager, if I decided to do something, I can make it happen which isn't the case in many universities, this is not the case in many university board... This is a managed institution. Having a division structure helps...*". (DIAGRAM 5.2 M-SCOT framework ④).

In the implementation of 'NetCal', the admin staff as a social group was a key 'RSG'. Firstly, the group was recognised as an incentive to attract the division leaders and the senior staff to take-up on 'NetCal'. Secondly, the group acted as a mechanism to inform and disseminate the new working practice. Within their remit, the admin staff are a small group of people who share responsibility of managing the calendar and the admin work for the head of school and the wider school needs. The admin staff are

responsible for organising and informing of forth-coming meetings and they started sending out meeting requests using ‘NetCal’ which reinforced the intention of the head of school and in doing so also created peer pressure. He explains, “*Started to implement it by sending out meeting request, got to the stage where people get used to strange emails and because they are computer literate, they knew what they are supposed to do*” (DIAGRAM 5.2 M-SCOT framework ③). This implementation roll-out was additionally backed up by intolerance to reluctant users and non-users, “*It is a very simple rule, if they don’t turn up because they don’t use calendar. That’s their problem, it’s not mine...*” (DIAGRAM 5.2 M-SCOT framework ⑥).

DIAGRAM 5.2
M-SCOT framework – Head of school

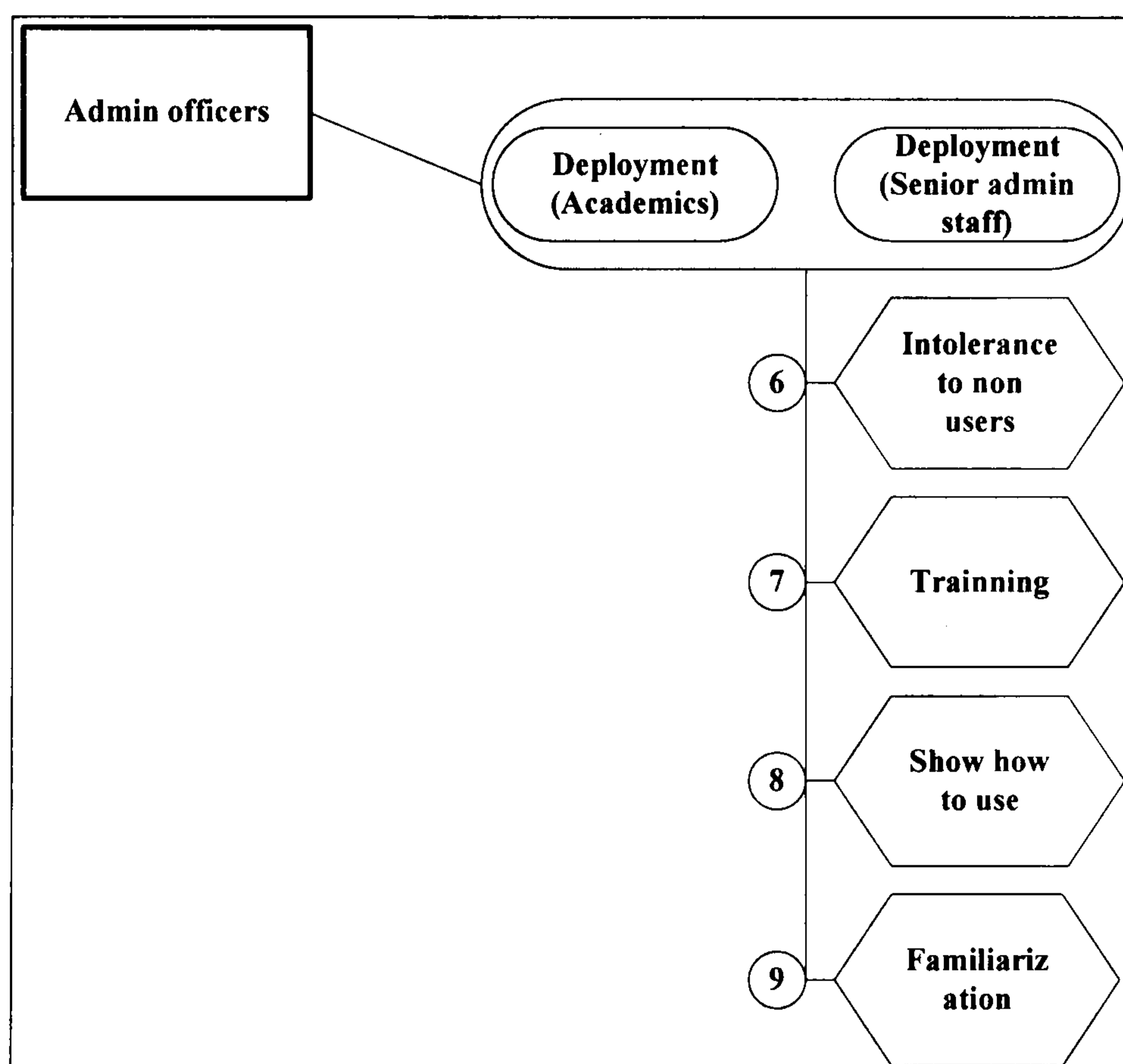


The above discussed ‘strategies’ were confirmed in the analysis of the interview data with the admin staff, as shown in diagram 5.3 below. The response to the question of “*How do you arrange meetings with people who don’t use ‘NetCal’?*”, the admin staff replied that, “*...I think it is to do with keep plugging away at it. Then eventually, people will get a notice 'oh, that's how it's happening now...'*” (DIAGRAM 5.3 M-SCOT framework ⑨). The adoption of ‘NetCal’ was also assisted by the attitude of

intolerance taken towards non users by the admin staff. A typical attitudinal comment was made, “...occasionally with academics, they don’t put their teaching in so you might find that ‘oh, I can’t do that because I am teaching’ and my general response to that is ‘it was not in your calendar’ so I am not very sympathetic” (DIAGRAM 5.3 M-SCOT framework ©).

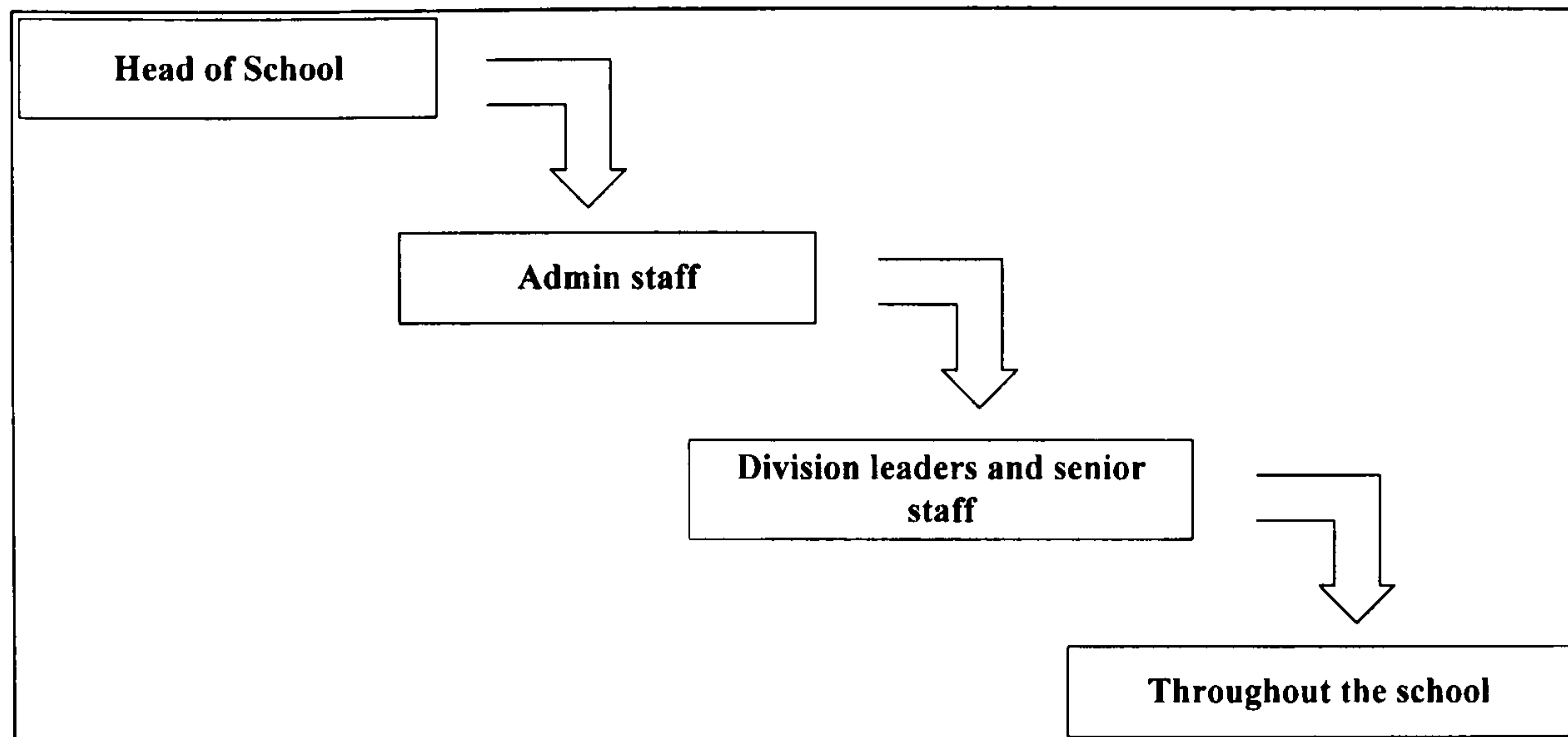
The same admin staff recalls the culture of intolerance towards non users “...missing a meeting because you didn’t know it was in your calendar was not considered to be an excuse because we all are supposed to be using it” (DIAGRAM 5.3 M-SCOT framework ©). The attitude of the admin staff’s appeared to mirror the ‘strategies’ set by the head of school, acting as a public face of the school’s new rules.

DIAGRAM 5.3
M-SCOT framework – Admin officers



This intolerance was implemented by the head of school and exercised by the admin staff through the gradual introduction of the technology. The diagram below illustrates the incremental implementation of ‘NetCal’ at ‘SCS’, starting from the advocator then the advocator’s, in this case, the head of school’s direct working relationships, the admin staff, followed by the division leaders and senior staff who have an direct authority over the lecturers and finally to the wider users.

DIAGRAM 5.4
Incremental implementation of GCS at 'SCS'



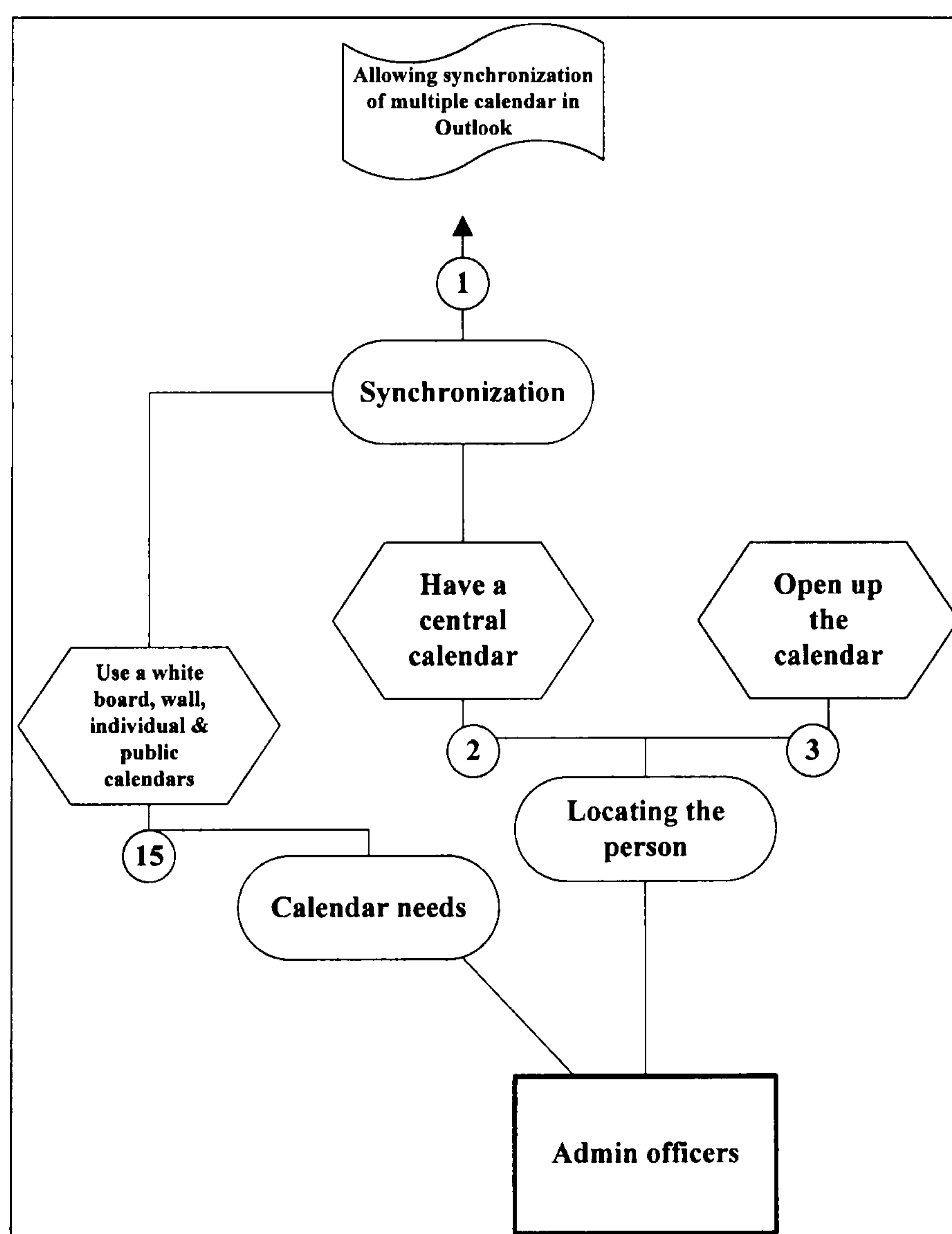
The above table shows the implementation process of 'NetCal' in this organization that the transformation of calendar practice in the beginning of adoption stage of 'NetCal' was the outcome of the systematically designed implementation strategy. It was also observed that except the senior lecturers, the new member of staff share a room with the existing members of staff. There are a limited number of rooms and it is obvious that the new staff move into an existing office. The effect of this is that it acts as a way of informing of the working practice and showing them how things are and should be done in this organization. The next section looks at one of the aspects of the 'NetCal' usages in this organizational context.

5.4.2 Embedding 'NetCal' into working practice

The usage of 'NetCal' in 'SCS' can be characterised as the embeddedness of 'NetCal' in the everyday activity, intertwined with the existing working practice. One of the examples of the embeddedness is the way in which 'NetCal' has replaced or been added to the conventional practice of informing of the whereabouts of oneself. The admin offices are divided into two on the same floor, having a few offices in between. They have a central calendar among themselves in 'NetCal' in order to let other admin staff know their whereabouts especially during the lunch hour so that one of the offices can be open throughout the office hour. This issue is presented in a diagram 5.5 below. The central calendar between these two offices acted as a communication tool. One of the interviewee explains, "...I think, I go swimming twice a week and Rachel (pseudo name) goes to fitness class once a week, I was trying to go on days

when she wasn't going...and if you were meeting a friend and have a longer lunch, you've got to see what the rest of the people are doing..." (DIAGRAM 5.5 M-SCOT framework ②). The admin staff also felt it was useful not only to have a central calendar but also to open up the calendars to each other as when people phone up and ask to speak to someone then they could tell the person exactly when he or she is going to be back. They found that it is useful to tell others when they can get hold of the person by having access to other's calendars (DIAGRAM 5.5 M-SCOT framework ③). However, 'NetCal', as an informing tool can be problematic. For example, some would add travelling time and some do not which means that the accuracy of one's calendar is variable. There has to be agreed practice in order to use 'NetCal' effectively to inform whereabouts of the others.

DIAGRAM 5.5
M-SCOT framework- Admin officers



In 'SCS', the observation study revealed that the usage of 'NetCal' as an informing tool was also coupled with the accepted social practice for example, there were three

academic staff sharing an office together and when one of them went out to get lunch, she announced to everyone that she was going. No one responded to her and no one was expected to respond to her announcement. She was verbally letting others know that she is taking a lunch break. It is due to the flexible working hour that lunch break is varied from a person to person and people tend not to put their flexible lunch hour in their calendars. In addition to the verbal announcement, there was a notice board on the wall that was still being used to indicate when anyone is off and for how long. 'NetCal', as an informing tool is used in conjunction with other existing forms and has become a part of the accepted working practice. An uncovered example was the usage that they labelled as, 'White time' (indicating the colour of the time slot in 'NetCal'). When they have a time sensitive event such as calling someone by 10am, they would put that in their calendars to remind themselves, they put it as 10:00am – 10:00am, it will remind them of the call but will not be shown to other people as they are busy in that time. These are examples of people making use of the technology through making sense of the functions and adapting it to their daily working practices. This statement can be supported by the high adoption rate and three 'NetCal' usages that were identified during the interviews.

5.4.3 Three 'NetCal' usages

A site survey was conducted prior to the interviews in order to ascertain the 'NetCal' adoption level amongst the 57 teaching staff. The survey indicates that 'NetCal' is widely used and accepted as a tool for calendar practice. A response rate of approximately 77% was achieved with 86% indicating that they used 'NetCal'. Table 5.1 shows the details of the responses.

However, 'using' could mean for personal use only, or for arranging meetings with others after checking availability, or for arranging meetings without checking availability. Therefore defining what 'using' meant for the interviewees during the interview was considered to be important.

TABLE 5.1
Overall 'NetCal' adoption at 'SCS'

Division	No of staff	Returned	Yes	No
Computer Arts	10	8	8	-
Engineering	7	6	3	3
ICT	14	13	13	-
Mathematical Sciences	9	6	4	2
Software Engineering	17	11	10	1 (Does not use it due to visual impairment)
Total	57	44	38	6

As one of the aspects of the investigation of the term 'using', it revealed that there were three 'NetCal' practices that prevailed in this organization which are termed as 'Active', 'Passive' and 'Apathetic' to describe the 'NetCal' users' approaches and practices. Different types of usages emerged during the interview. In the subsequent analysis stage, these were collocated and grouped by process characteristics, revealing distinct groupings of three types.

Out of twenty two interviewees, a head of school, an Information manager and four admin staff and were excluded from the grouping of the users as their working practices are specific. Therefore out of sixteen interviewees, 9 'Active', 4 'Passive' and 3 'Apathetic' users were identified. These three practices are clearly different and the 'Apathetic' approach appears to work against the organizational 'NetCal' usage on the surface. However, the dynamic interrelationship between these three practices forms the critical mass of users that is sufficient for groupware adoption.

'Active'

The 'Active' users are a group of people whose main calendar is 'NetCal'. They view and update it frequently throughout the day. It is for their own benefit as 'NetCal' provides them with data security and a way to organize and manage their time. However, they also consider its benefits for their colleagues; for instance, frequent updating of their calendars provides up to date information to others to 'accommodate others'. In return, they view people who do not use 'NetCal' or do not update their calendars as people who refuse to accommodate others. They also view others'

calendars to see the availabilities and to arrange meetings. This is accepted as part of their work in the organization.

‘Passive’

The ‘Passive’ users use it for their own benefit because ‘NetCal’ provides them with data security, having their calendars stored in the central computer. They view and update their calendars in order to manage their time. People in this group do not consider using ‘NetCal’ to view other’s calendars or to arrange meetings. They arrange meetings by phone or face to face. Their calendars are up to date and they are used by the ‘Active’ people for viewing the availability and/or arranging meetings. As far as the ‘Active’ people were concerned, there is no difference between ‘Active’ and ‘Passive’. This was only revealed through the interview study about the subtle difference between ‘Active’ and ‘Passive’ users.

‘Apathetic’

The descriptive term, ‘Apathetic’ was used to describe a small number of people in this organization who do not use ‘NetCal’. They use either paper calendar or an email system to remind themselves of upcoming events. One of the interviewees was using email system by leaving any unattended emails in the email box to remind himself and delete as it is completed. However, they still appeared to be using it when others access their calendars as they would press ‘accept’ or ‘decline’ button when they receive the meeting requests from others and by pressing ‘accept’ button, it would automatically add into their calendars. This can be termed as, ‘phantom usage’.

The ‘Active’ users created a working environment for ‘NetCal’ in this organization, enabled by the function of calendar update automation that despite the ‘Passive’ and ‘Apathetic’ users, the necessary critical mass of users could be achieved.

5.4.4 Case study one summary

This section discussed firstly, the transformation of the calendar practice through the systematic incremental implementation strategy and the intolerance to non-user approach. These present the organizational perspective of the ‘NetCal’-in-use.

Secondly, the discussion of the embeddedness of 'NetCal' and the three different usages provided a perspective of the people making use of 'NetCal'. These perspectives provided a contextual groundwork for section 5.7 and Chapter 6 for in-depth analysis of GCS-in-use through these two perspectives.

The second case study focuses upon the admin staffs' calendar usage. This is to investigate further the social dynamics in the process of temporal coordination as this is one of the admin staff's main activities.

5.5 Case study two: 'CIM'

The data collection and analysis methods, used in the first case study were repeated establishing data method consistency. The second case study focused upon interview data and a short questionnaire and observational evidence were also collected. The M-SCOT framework was used to analyse data from the semi-structured interview. Unfortunately obtaining paper reference copies of the calendars was not possible due to the confidentiality and position status of the interviewed. However this was offset by the supplementary data material which was gained through observation of using 'NetCal' by individuals, sending out and accepting the meeting requests, making and answering calls related to scheduling and observation on the working relationships and working practices in general. The sections 5.5.1 and 5.5.2 illustrate the background of the second case study and the way in which data was prepared for the M-SCOT framework. This is followed by some of the findings that characterise the researched organization in 5.6.

5.5.1 Case study background

The study was conducted over a period of a month at the IT business organization, 'CIM' which is a global communication provider. There are approximately 6,000 employees based in the UK and approximately 58,000 in 65 countries worldwide. There are three UK branches, about 20 miles away from each other (one of the branches was scheduled to be closed in the same year as the research took place). The case study took place in the headquarter of the Europe, the Middle East and Africa branches. There are approximately 20 Vice Presidents (VPs) and each VP has about 8

senior directors and about 8 directors within the site. These VPs have around 300 staff across Europe. There are approximately 1,500 to 1,700 employees including around 30 personal assistants (PAs) in a three storey building. Each floor is designed as an open plan except top management who had private offices.

Each PA is responsible for handling more than one calendar since there had been a cut in admin staff over the last few years. PAs manage calendars but also give a general admin support to the department in which she or he works. For example, in the international engineering department with 322 staff, there were 22 to 25 admin staff previously but there is now only 5 admin staff. Many of the directors also lost their PAs and since then PAs to VPs tend to help some of directors' admin work including arranging meetings and booking travel. The restructure had meant that a PA has access to several calendars with viewing only or write-in access in most of the cases. PAs are frequently engaged in communication with their superiors and the members of staff as well as the PAs in other branches or other continents in order to arrange meetings for teleconference or videoconference except with the USA due to security reasons. The working environment was flexible in that completing the given tasks and works in hand were viewed to be more important than staying in the office during office hours. Rearranging the working hours was also possible as long as it was agreed upon with the superior.

'NetCal' was launched during the Y2K project with a free/busy default setting. There was no training because it was perceived as a system that anybody can start using without any training even though computer support receives regular calls regarding the usage of 'NetCal'. There was also no enforcement of using 'NetCal', it was people's choice to use it or not.

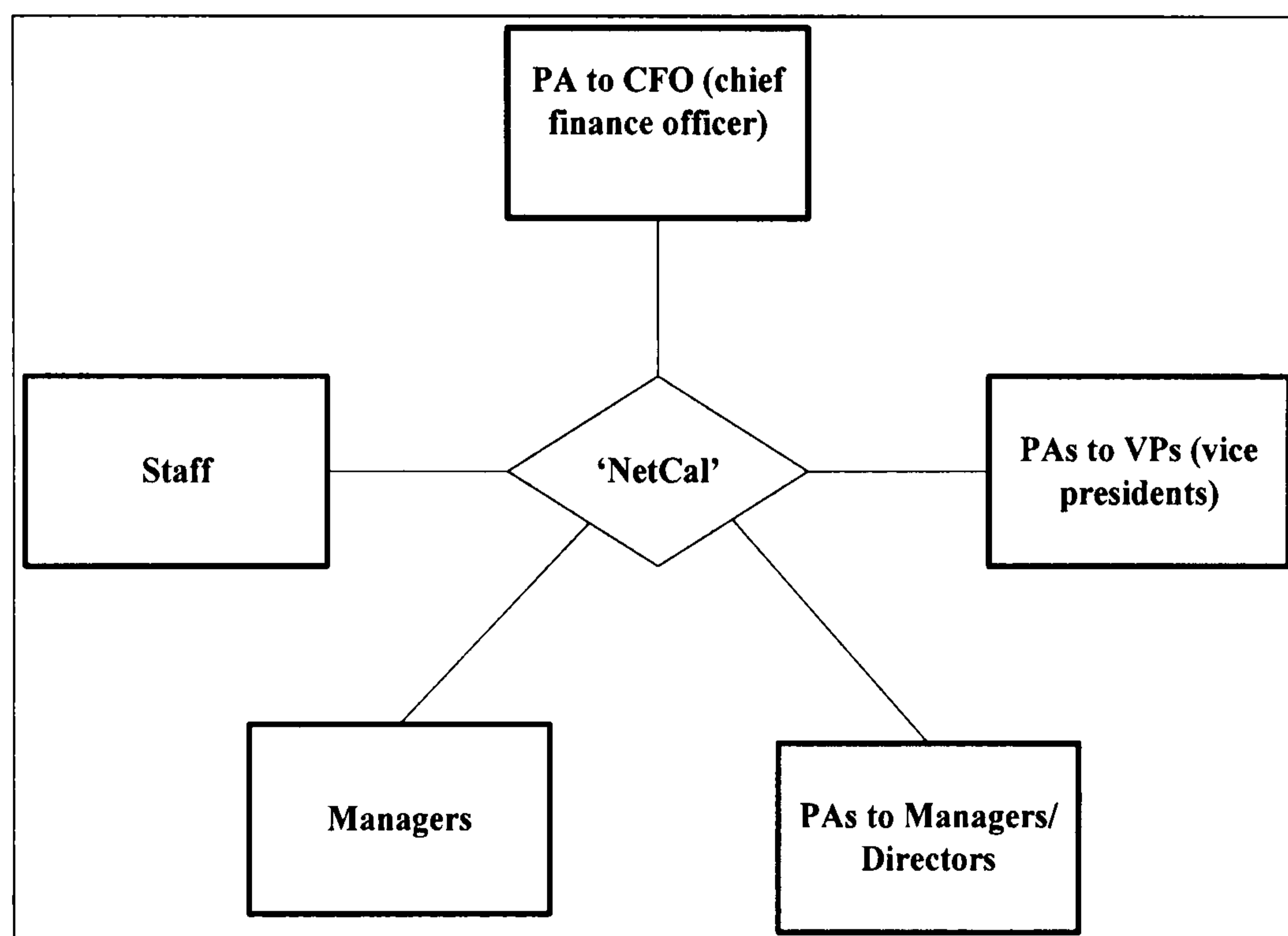
Twenty four people were interviewed and each interview took between 20 to 30 minutes including a short questionnaire. Interviews were conducted with the following people:

- Thirteen PAs
- Three managers
- Eight staff

5.5.2 'RSGs' of 'CIM'

The 'CIM' data was grouped into five 'RSGs' according to the positions and the roles that they performed in the organization: 'PA to CFO', 'PAs to VPs', 'PAs to Managers/Directors', 'Managers' and 'Staff' (DIAGRAM 5.6).

DIAGRAM 5.6
'RSGs' of 'CIM'



The aim of this case study is to further the understanding of the social dynamics of GCS-in-use and therefore, PAs were separated and grouped into three: 'PA to CFO', 'PAs to VPs' and 'PAs to managers/ directors'. This facilitated examination of the social dynamics among PAs as a group in relation to other social groups but also among themselves as there is a different organizational setting for a PA who works for a CFO and a PA who works for a manager or a director. However, the primary role which is common to all three groups is to manage the calendars of the key member of the organization by negotiating and insisting on the time and place on behalf of their superiors in order to coordinate the time. The next section reports upon some of the findings using the M-SCOT framework which also offer contextual background for section 5.7.

5.6 Case study two: the operationalization of the M-SCOT framework

‘NetCal’ is viewed in this organization as an admin tool largely for PAs to use to manage the calendars of the management, this is unlike the first case study where the usage was much more widespread. One of the main differences between the two cases can be partly explained by the fact that there was no champion who encourages and publicizes ‘NetCal’ usage in this organization. The adoption was led by the ‘bottom up’ usage realization of its benefits and suitability for the work by the people themselves. It was clear that ‘NetCal’ was used more by the management and the secretaries than the lower staff in the hierarchy, because the management in this organization spent their time largely on attending meetings and the secretaries on organizing meetings. The complete SCOT analysis of all the identified social groups and the analysis can be found in appendix C.4.

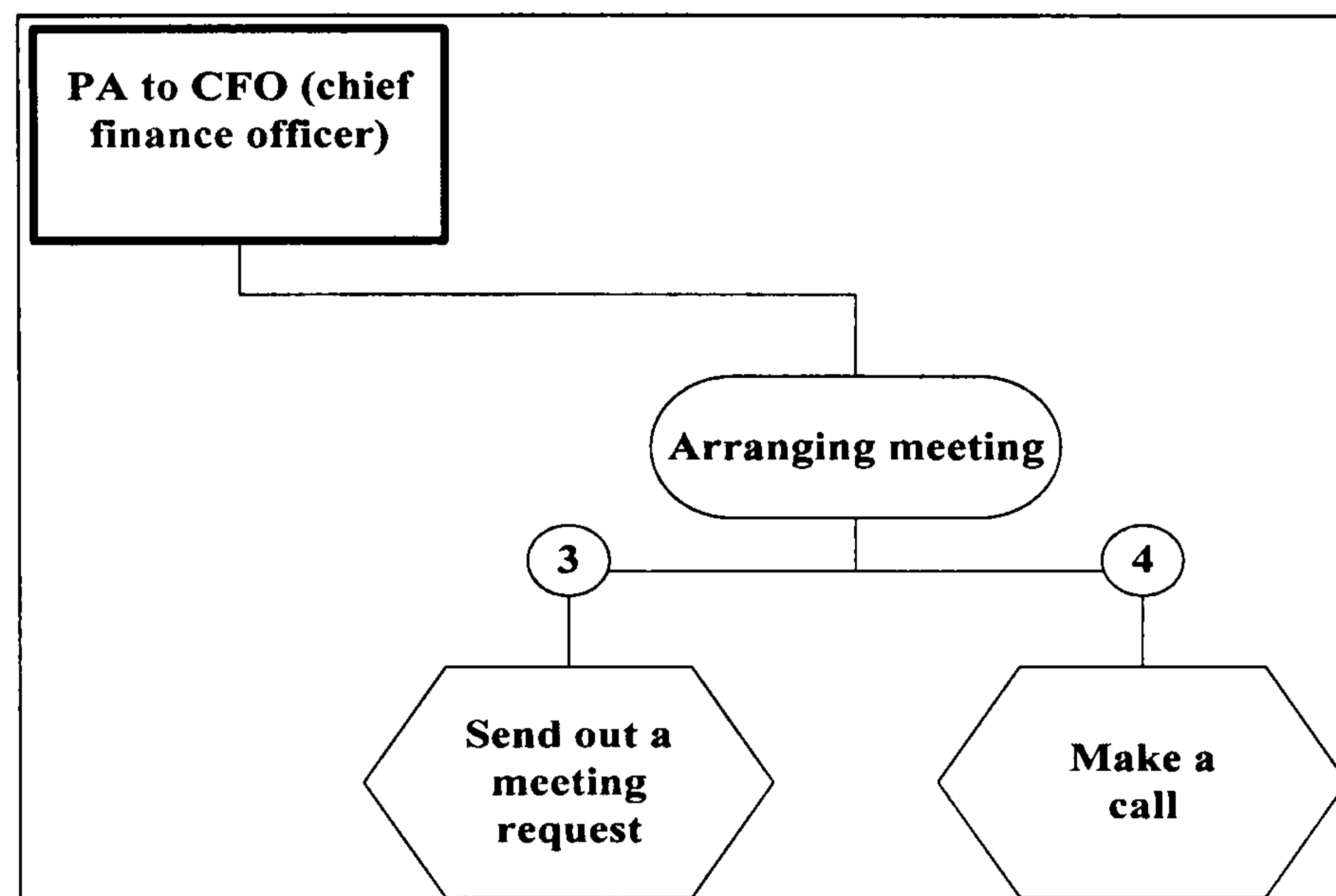
The analysis of the second case study focuses on the practice of the arranging meetings as a key aspect of the temporal coordination activity. The usage of ‘NetCal’ in ‘CIM’ revealed that arranging meetings can be analysed from two interrelated perspectives: practicing judgement on using ‘NetCal’ and practicing the organizational hierarchy through ‘NetCal’ which are discussed respectively. These aspects highlight the social and political factors that dictate the way in which ‘NetCal’ is being used.

5.6.1 Practicing judgement on using ‘NetCal’

The analysis of five social groups from the issue of arranging meetings revealed that ‘NetCal’ was not just a technological system but rather it belongs, as part of a wider social process, to the social practice and social system of arranging meetings. Each social group was revealed to have different solutions towards the issue of arranging meeting depends on various interrelationships of social and technological factors. It is embedded into a wider social practice. For example, in the case of a PA to CFO, due to the position of CFO in the company, meetings are arranged frequently with Asia Pacific and the USA. Between these busy people, meetings are difficult to arrange, involving a consideration of time difference factor and the priority factor. The PA to CFO explains that when Asia Pacific and America are considered, because of the time

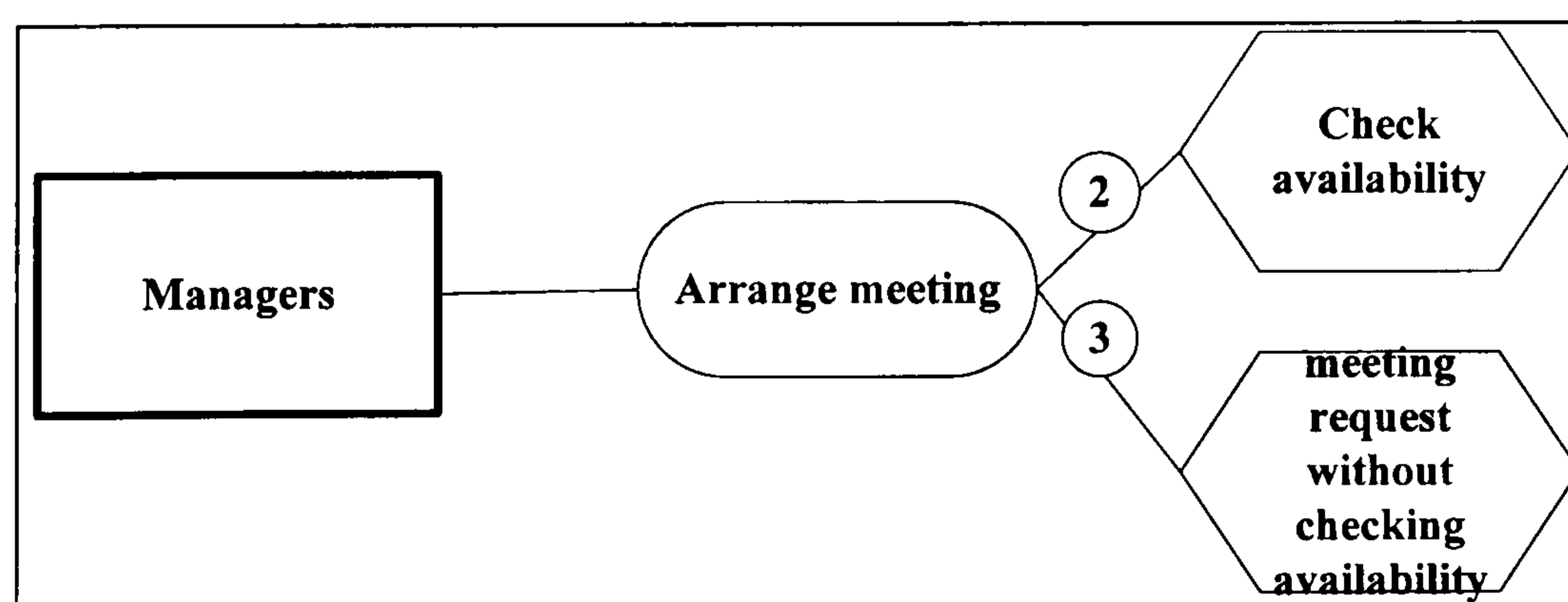
differences and the invitees are equally busy and therefore it is sometimes easier to make a phone call (DIAGRAM 5.7 M-SCOT framework ④) but when organising a meeting with people in Europe, he takes a priority so would just send meeting requests which makes her work much easier (DIAGRAM 5.7 M-SCOT framework ③).

DIAGRAM 5.7
M-SCOT framework – PA to CFO



It is the user who defines 'NetCal' usage and adapts it to their process of arranging meetings. One manager explains that even if not everyone uses 'NetCal', for arranging meetings with 3-4 people, she would check their availability (DIAGRAM 5.8 M-SCOT framework ②) but if it is around 20 people, she would send meeting requests without checking the availability of the invitees (DIAGRAM 5.8 M-SCOT framework ③).

DIAGRAM 5.8
M-SCOT framework – Managers



People make a judgement about the usage of 'NetCal' based on their learned norms as the technological system becomes deep-rooted in everyday life.

5.6.2 Practicing the organizational hierarchy through ‘NetCal’

This section presents the analysis, exposing the dynamic relationships that exist between social groups when arranging meetings. The data analysis revealed that the act of arranging meetings using ‘NetCal’ presents the temporal hierarchy that exists in social relationships. ‘NetCal’ acts as a medium through which social hierarchy and power relationships are realized, exercised and disseminated in usage. From the analysis, the arrangement of meetings can be broadly sub categorised into three classes from the perspective of an inviter as well as an invitee. These are briefly explained below.

- Meetings with superiors
- Meetings within the same level
- Meetings with subordinates

Class one: arranging meetings with superiors

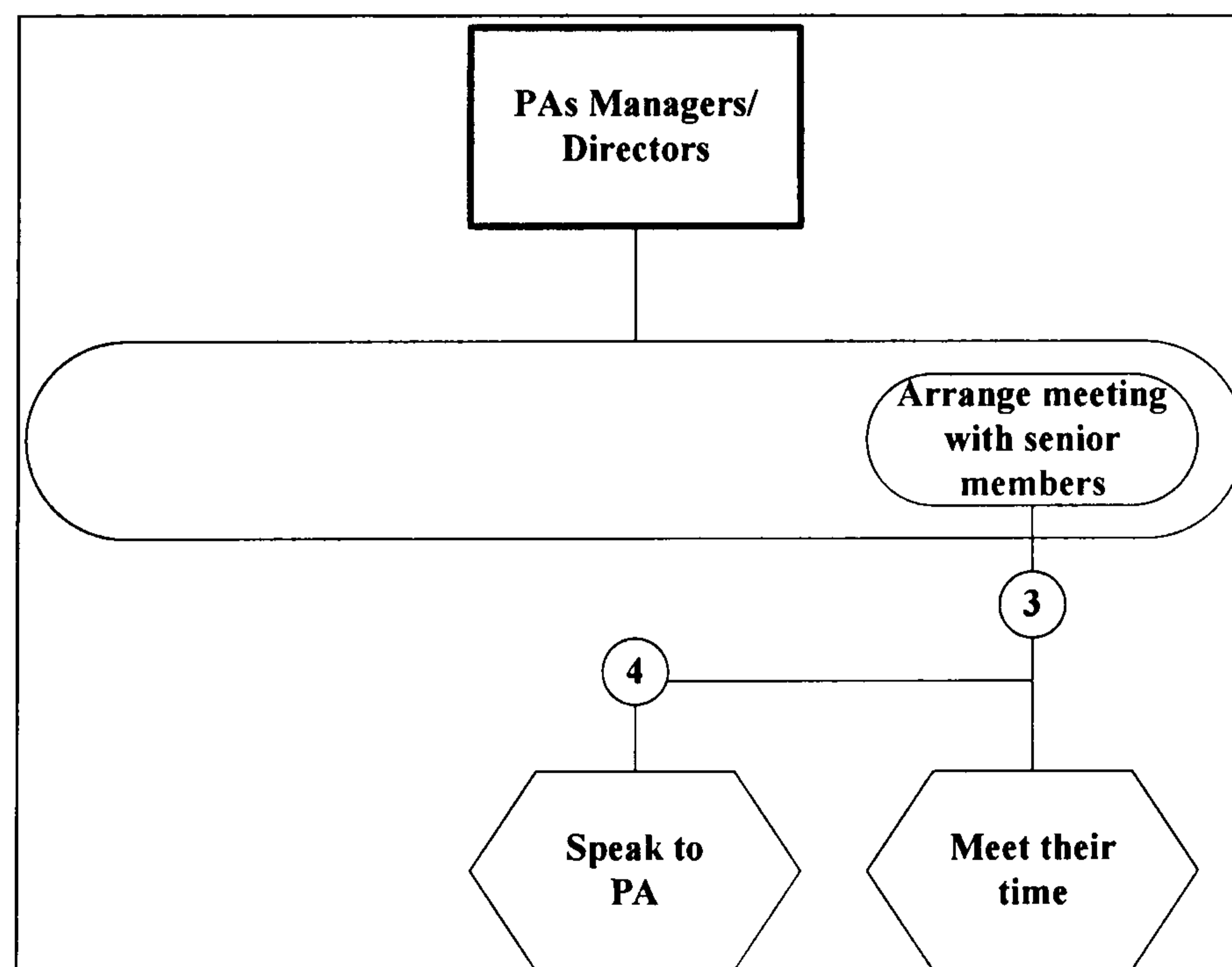
As an example, one of the PAs to a director explains the working relationship she has with other PAs to senior members and also how seniority affects the way in which the meetings are arranged. She explained, “...*I would not dream of sending a meeting request to Susan... (pseudo-name) (who is a PA to the person whose status is higher than her boss)*” (DIAGRAM 5.9 M-SCOT framework ③④). For her, it is what is expected of her, respecting the time value of the person. She continued, “*Out of respect for other people, I would phone them and ask first and I would expect that from people certainly at Director’s level but in VP level, I wouldn’t. I then try to make an alternative arrangement for my meetings...*” (DIAGRAM 5.9 M-SCOT framework ③). PAs to VPs group also agrees that ringing a PA is a normal working practice when arranging meeting as “...*the more senior is the fuller their diaries are...and also the senior PAs don’t like it when a meeting request is sent out without asking, so you have to be very apologetic*”. This non verbal agreement among PAs is also reflected on their dealing with the people who break the code by sending a meeting request without talking to them first. One of the PAs explained that it is with her boss’ acknowledgement that “...*I decline it, I don’t care. If somebody just hasn’t had a decency to actually phone me and check first, I will just decline it*” (DIAGRAM 5.9M-SCOT framework ③④). The other PA to a manager confirmed the influence of

the seniority that “...if his manager says, ‘I want to have some time with you’ and he’s got four, five appointments, any of those, five appointments can be cancelled... just drop everything so it will be down to his manager to elect the time, not for him to choose time” (DIAGRAM 5.9 M-SCOT framework ③).

For PAs, ‘NetCal’ is useful to some extent but as far as meeting with the senior members are concerned, “No, it’s the PA who is the fundamental part of this...not just it (‘NetCal’), it is useless but also out of respect for PA...” (DIAGRAM 5.9 M-SCOT framework ③). Questioning the usefulness of ‘NetCal’ for arranging meetings with senior members, she claimed that “...It would be my judgment, not what the calendar’s availability says” (DIAGRAM 5.9 M-SCOT framework ③). It is the PAs who know the managers’ temporal preferences for example, when her manager wants or does not want to have a meeting and also which meeting can be flexible to be moved around. This relationship echoes the interview findings in the pilot study in section 4.3.3 where the organization hierarchy is the main determining factor for social negotiation activity.

DIAGRAM 5.9

M-SCOT framework – PAs to Managers/Directors

**Class two: arranging meetings within the same level**

The practice of arranging meetings with people of the same status has similarities to that of PAs to senior members. However, the additional attribute here would require

the step of identifying the key people for the meeting and arranging the meeting according to their schedules. It is to complete the work of coordination of a meeting by prioritising it especially when there are a number of invitees.

Some of the interviewees explained the incorporated usage of 'NetCal' that once the meeting is agreed over the phone or instant messaging service in the case of coordinating with Europe, then a meeting request would be sent out as a confirmation so that the calendars of invitees can be updated. It is still the work of PAs for instance, willing to communicate and negotiate, required to arrange meetings with people of the same level whose calendars are full.

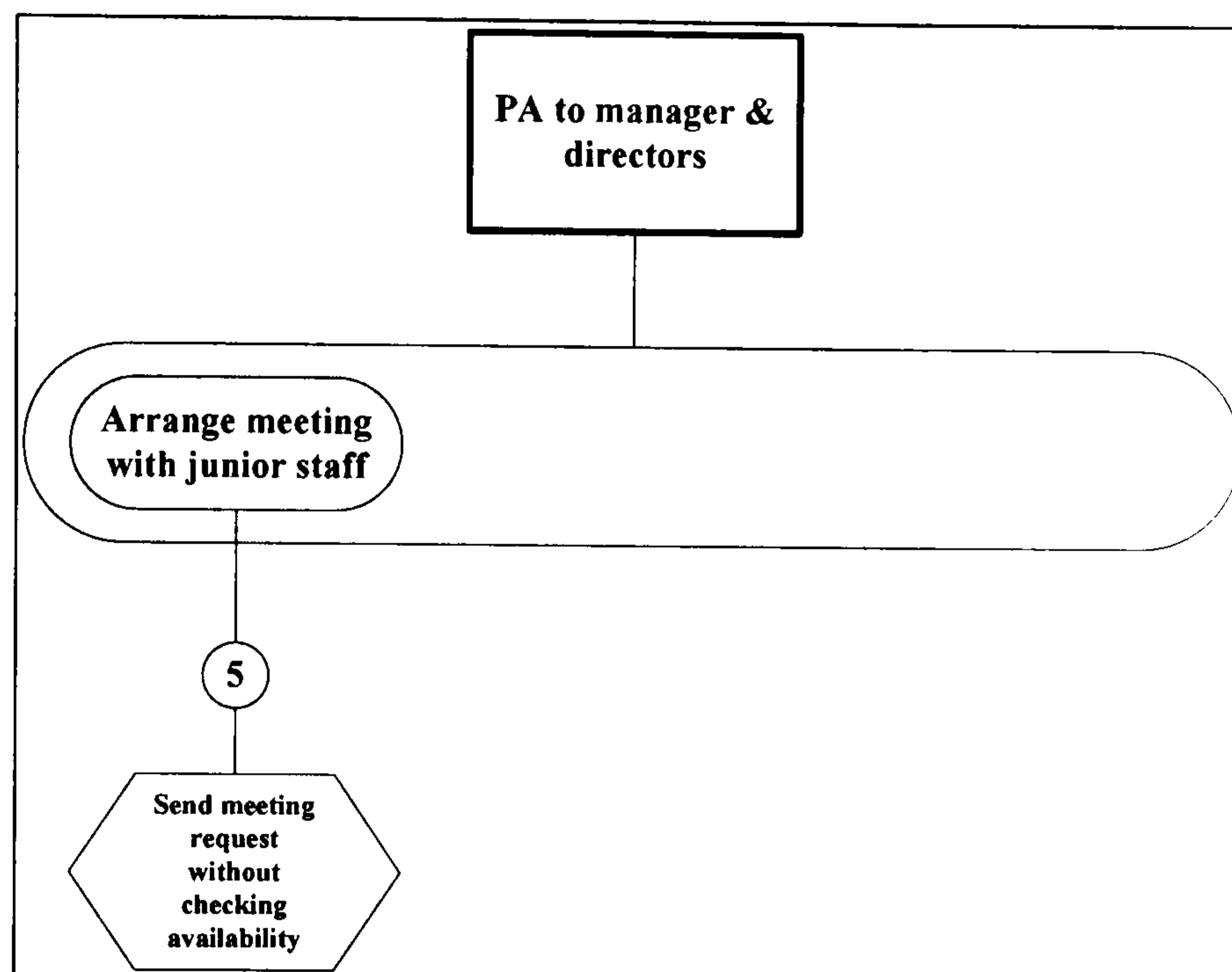
Class three: arranging meetings with subordinates

The instantaneous notification function of 'NetCal' provides the means to formalize the coordination of the time and place in this class. The use of the system removes ambiguity of scheduling. The analysis found that social excuses of not attending meetings and human errors are eradicated for example. This social interaction removal is in part due to the function of 'NetCal' which allows invitees' calendars to be automatically updated. This function is particularly useful for superiors as it acts as a meeting notification tool where the superiors tell subordinates where they should be and when. It is based on the understanding between the two parties that the value of time is not an equal relationship. This relationship and the practice are not new but what 'NetCal' is offering is that it provides the means to transmit and formalize the relationship and the working practices.

This is well summarized by one of the PAs who does not check the availability, "*just send it (meeting request) out and you will be there*". This is a 'let them sort it out' attitude towards people who are considered to be in the lower organizational hierarchy. She explains further that "*once you go below regional sales managers' level, don't tend to call to find out their availability and I will just send them meeting requests*" (DIAGRAM 5.10 M-SCOT framework ⑤). The subordinates have fewer meetings to attend and to arrange. Their work calendars are timetabled by the people above and they have no choice but to attend the meetings that are arranged by their superior unless it conflicts for example with the meeting with the clients which are

considered to take precedence. People could be put into a situation where the calendar conflicts arise due to the meeting requests from equally high positions in the company. This is when personal judgements are required.

DIAGRAM 5.10
M-SCOT framework – PAs to Managers/Directors

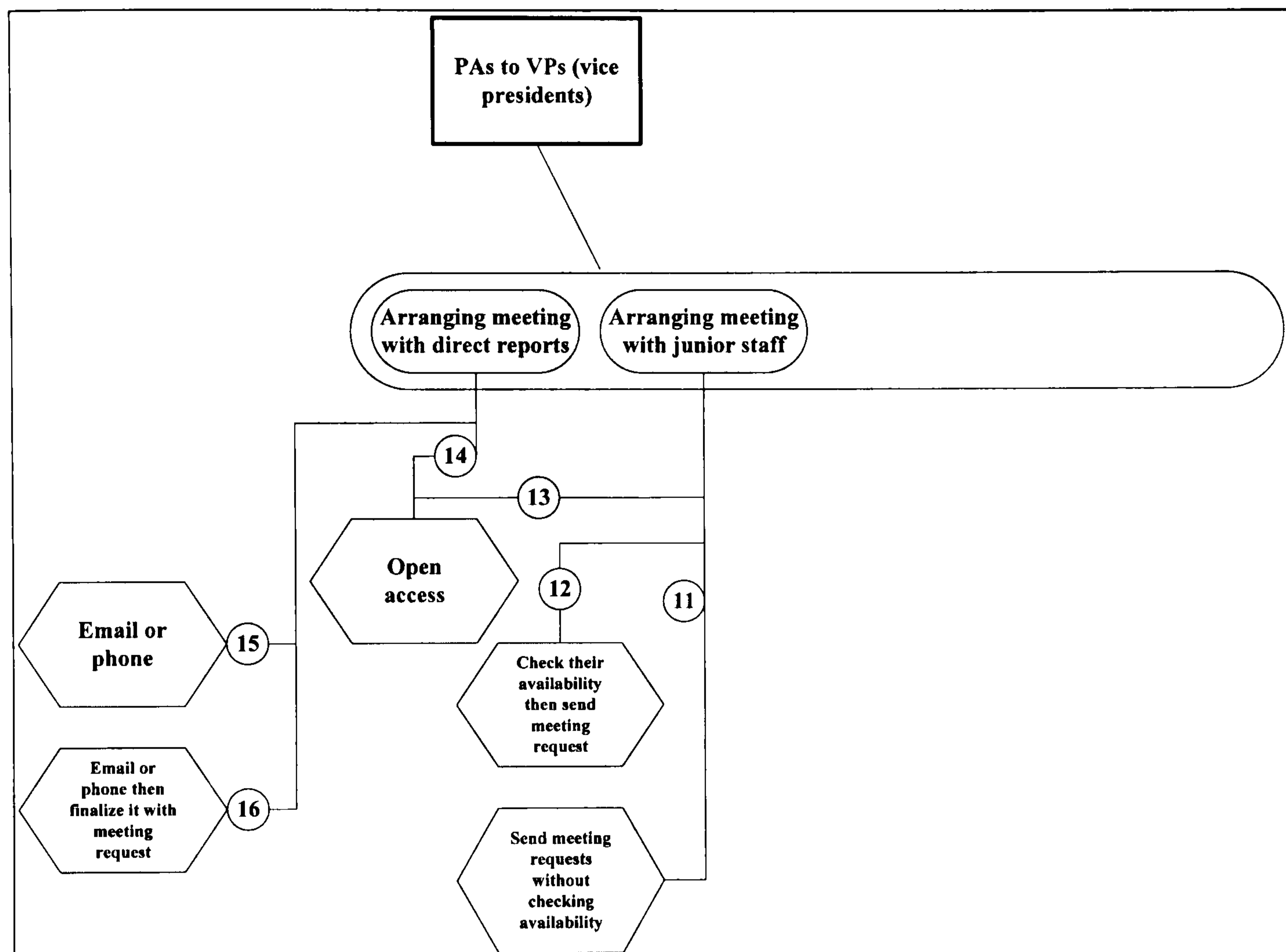


One of PAs to VPs remarked that she would check their availability in case they might have a meeting with other VPs (DIAGRAM 5.11 M-SCOT framework ⁽¹²⁾). She felt that this was necessary to avoid a conflict of interests.

In the case of arranging meetings with direct reports, PAs to VPs group uses various practices. Some of the PAs were given a viewing or even write in access to some of the direct reports. As there are frequent meetings between VPs and direct reports, PAs view and move the calendar items around in their calendars if necessary. For instance, in the engineering department, there are six direct reports and when there is a call for a meeting from senior members, she considers the direct reports having no choice but to accept the changes in their calendars. If there is a conflict, she sees what meetings they have and makes a decision on which one can be moved to fit hers (DIAGRAM 5.11 M-SCOT framework ⁽¹³⁾ ⁽¹⁴⁾). She has to make a judgement when rearranging their calendars based on an understanding of the work and work relationships. However, PAs who do not have access to the calendars of direct reports, considers calendar as a reference and not as a 'decider' that they tend to make a call and

incorporate 'NetCal's meeting request function to finalise the meeting scheduling process (DIAGRAM 5.11 M-SCOT framework ¹⁵ ¹⁶).

DIAGRAM 5.11
M-SCOT framework – PAs to VPs



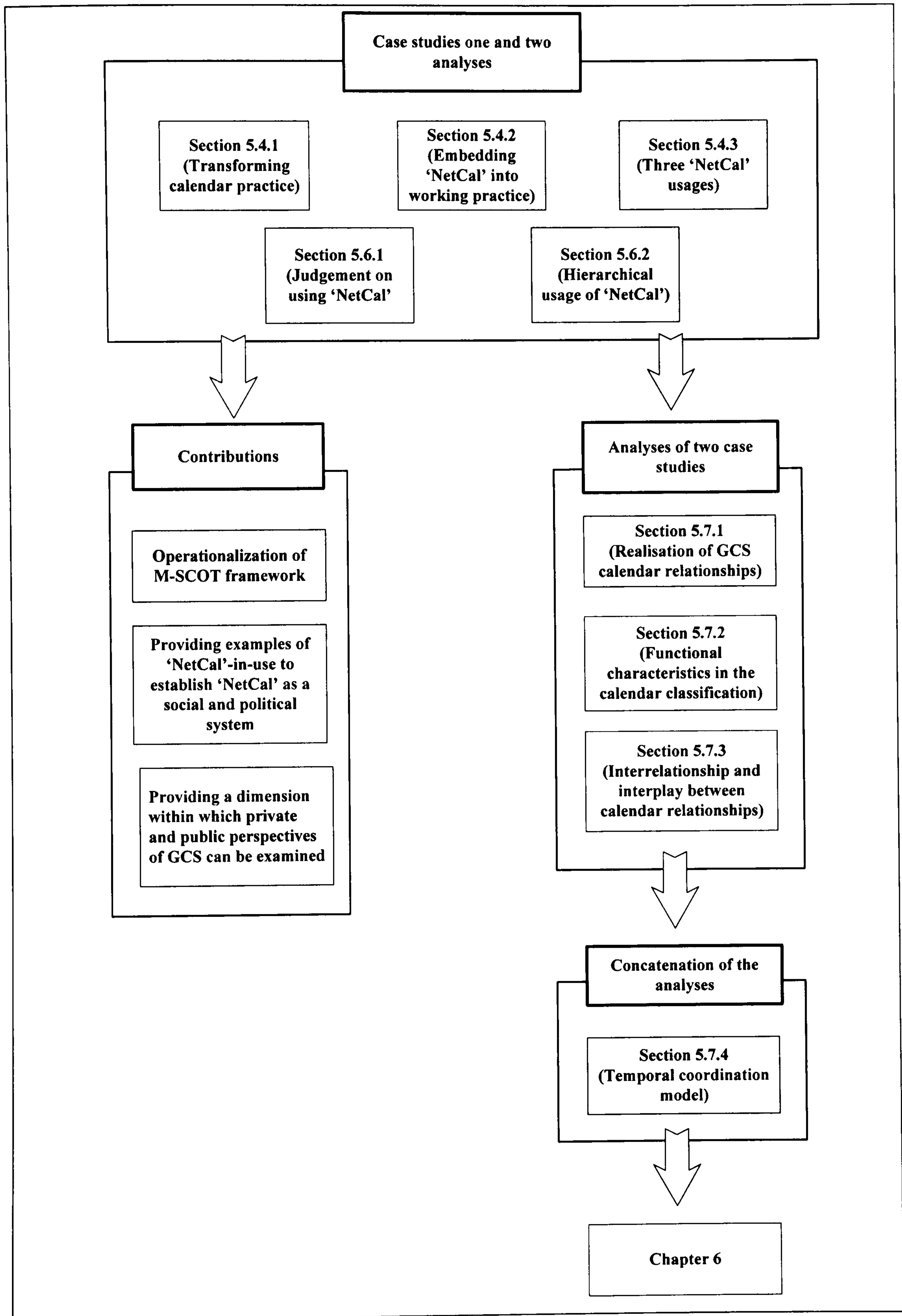
Section 5.6 has focused on the analysis on the arranging meeting activity as a key dimension of analysing temporal coordination. The discussions above in 5.6.1 and 5.6.2 confirm firstly that scheduling is a socially negotiated activity as discussed in section 4.3.3 even when the process is mediated by technology and secondly that 'NetCal' has an overtone of political relationships in that it reinforces the existing power relationships. This is based on the fact that the higher up in the organizational hierarchy the person is, the more value their time has. The discussion above has shown the ways in which temporal hierarchy is reflected and accommodated in the usage of 'NetCal'.

5.7 Implications of the case studies: a temporal coordination model

The diagram below represents the contributions and the workings of the discussions of this chapter diagrammatically (DIAGRAM 5.12). The sections above discussed findings of the two main case studies separately using the M-SCOT framework. The two general contributions of these discussions are firstly that these demonstrated the operationalization of the M-SCOT framework to be used for the analysis of technology-in-use. Secondly, the case study analyses have confirmed and developed the social and political characteristics of the current understanding of GCS further. In particular, the previous sections have uncovered a GCS dimension within which private and public perspectives can be examined. Some of the examples and the perspectives discussed here are carried forward for the in-depth discussion of the relationship between these two perspectives in Chapter 6.

This section presents the analysis from these two case studies. It uses a pattern-matching technique to confirm and expand the understanding of the classification of the three calendar relationships by differentiating the functional characteristics of them, using the classification developed in section 2.4.1. Using the analysis from the M-SCOT framework, the interrelationships and interplay between these three calendar relationships are examined. This section concludes with a temporal coordination model which is developed from the case study analysis.

DIAGRAM 5.12
Process of Chapter 5 sections



5.7.1 Confirming the three calendar relationships

Using the attributes of three calendar relationships of GCS discussed in section 4.4, the analysis from the two case study data are now formulated in a case-ordered meta-matrix display (Miles and Huberman, 1994) and these characteristic examples are presented below (TABLE 5.2). This work is based on numerous iterative readings of the data, applying the characteristics of the three calendar relationships of GCS found in the previous chapter (see section 4.4) to see if they could be found and realised in the daily working environment.

TABLE 5.2

Confirming the three calendar relationships

(Data sources are indicated with the case study site followed by reference number for the interviewee and the interview data)

Data	Individual Calendar Relationship (ICR)	Central Calendar Relationship (CCR)	Collaborative Calendar Relationship (CoCR)
'SCS'	Check calendar everyday in the morning to see what she has today. Regularly once a day and then depends on needs (Data source: 'SCS' 3.11)	Office calendar (5 people have an access to it and use it for holidays and their schedule) – because need to communicate with people in the other office (Data source: 'SCS' 14.6)	"I think the main advantage is you can arrange a meeting with other members of staff without having to either email or calling to their office. I think it is also useful if you want to have an informal chat, just to speak to somebody". (Data source: 'SCS' 3.15)
'SCS'	"I knew that I was in Glasgow some point this week but I didn't know when because it was in my calendar...it is fact that it's sort of dismissed in my head...because of the security of it being there" (Data source: 'SCS' 4.25)	No one particular is in charge of adding general meeting info. But 'WY' tends to keep eye on it to make sure both offices are not empty (Data source: 'SCS' 14.16)	"My division leader wants to know when I am not available and when I am available so she puts pressure on me and sometimes someone's organizing meetings and say, 'are you sure that you're busy next week, thinking that I am just filling up the calendar'". (Data source: 'SCS' 6.10)
'SCS'	During weekend, check what day she is free and so on... "I think it is good that I can see it from home" (Data source: 'SCS' 13.14)	they have two offices and difficult to know who is available to cover the office (Data source: 'SCS' 18.9)	Arranging meeting with 10 people "Outlook makes it straightforward and simple". (Data source: 'SCS' 20.16)
'CIM'	"there is no other way that you can plan a day, it is not possible" (Data source: 'CIM' 6.3)	"My job is managing his schedule and most importantly he is at right place at right time and making sure that I have	Find the most convenient time for her boss because he has very busy schedule and try to see if all the attendees are free at that time by using

		necessary reminders so many things that he is involved in and I also manage his calls. Basically anything that he is not, it is something that he does not need paying attention to and pass on to me that I can help with those things” (Data source: ‘CIM’ 1.1)	outlook. Try to find time that most of the people can make it ideally but if not, see what meetings that they have and also see if they can move those meetings around to fit hers. (Data source: ‘CIM’ 1.4)
‘CIM’	“It advises you so you are always on time. You are never behind the schedule. It reminds you, you have this task to do and you have this task to do” (Data source: ‘CIM’ 21.8)	Her managers and direct reports don’t really use ‘private’ tick because the hours that they work (from 8-8), it is easier for her to know when can and can’t disturb him. (Data source: ‘CIM’ 2.6)	She and another manager under him have access to the manager’s calendar. It is been set up this way in case he is away from the office for a long time and that manager is a second in command so can deal with things while her manager is not here (Data source: ‘CIM’ 12.9)
‘CIM’	The only time she uses ‘NetCal’ is when she has a recurring conference call. (Data source: ‘CIM’ 24.9)	If there is a meeting, email will be sent with date, time and place, ‘be there and that’s it’. you know something is going on and you just follow it (Data source: ‘CIM’ 4.3)	If you are a junior member then advised to use calendar. “...we are supposedly a paperless company” everything is done in PC. Not supposed to delete anything. Everything is archived. (Data source: ‘CIM’ 14.12)

This table displays the attributes of the three calendar relationships as analysed in the previous chapter. These findings firmly position the three calendar relationships. The implications of this confirmatory work leads to the questioning of the distinctiveness of the function of each calendar relationship, the attributes that separates one from the other. The next sub section examines them in relation to the functional characteristics identified in section 2.4.1.

5.7.2 Identifying the GCS functional characteristics in the GCS classification

The aim of this section is to differentiate the three calendar relationships, ‘ICR’, ‘CCR’ and ‘CoCR’ by their functional characteristics to gain a deeper understanding of their intrinsic qualities and to help to understand the implications of these relationships in temporal coordination. In doing so, the case study analysis is placed against the functional characteristics of GCS in section 2.4.1. The functional characteristics of GCS were divided into five broad functional characteristics;

‘supporting meeting arrangement’, ‘supporting communication’, ‘supporting personal calendaring’, ‘supporting work coordination’ and ‘supporting distributing calendar information’.

The analysis was based on an iterative reading of the data and the pattern matching technique to identify the functional characteristics using the classification explained above. The complete identified functional characteristics are presented in the appendix C.5. The example of the distinct functional characteristics of the three calendar relationships is now incorporated into the case-ordered meta-matrix display presented below with the data, used in the above section 5.6.1. The objective is to examine how different calendar relationships in GCS support different functions.

TABLE 5.3

The three GCS calendar relationships and the functional characteristics

Functional Characteristics	Explanations/ Examples of the Functional Characteristics	GCS calendar relationships		
		‘ICR’	‘CCR’	‘CoCR’
Supporting Meeting Arrangement	Automated arrangement of meetings and the meeting change			‘SCS’ 3.15 ‘SCS’ 6.10 ‘SCS’ 20.16 ‘CIM’ 1.4
Supporting Communication Accessibility	Availability check for a chat		‘SCS’ 14.6	‘SCS’ 3.15 ‘SCS’ 6.10
Supporting Personal Calendaring	Personal time management and a memoir	‘SCS’ 3.11 ‘SCS’ 4.25 ‘CIM’ 6.3 ‘CIM’ 21.8 ‘CIM’ 24.9		
Supporting Distributed Work Coordination	Asynchronous work coordination e.g. within line management structure, telework	‘SCS’ 13.14	‘SCS’ 14.6 ‘SCS’ 14.16 ‘SCS’ 18.9 ‘CIM’ 1.1 ‘CIM’ 2.6	‘CIM’ 12.9
Supporting Distributing Calendar Information	Information repository e.g. locating a person, meeting related information		‘SCS’ 14.6 ‘SCS’ 14.16 ‘CIM’ 4.3	‘CIM’ 14.12

Locating and placing the three calendar relationships in relation to the functional characteristics of GCS reveals and confirms firstly, that there are different processes

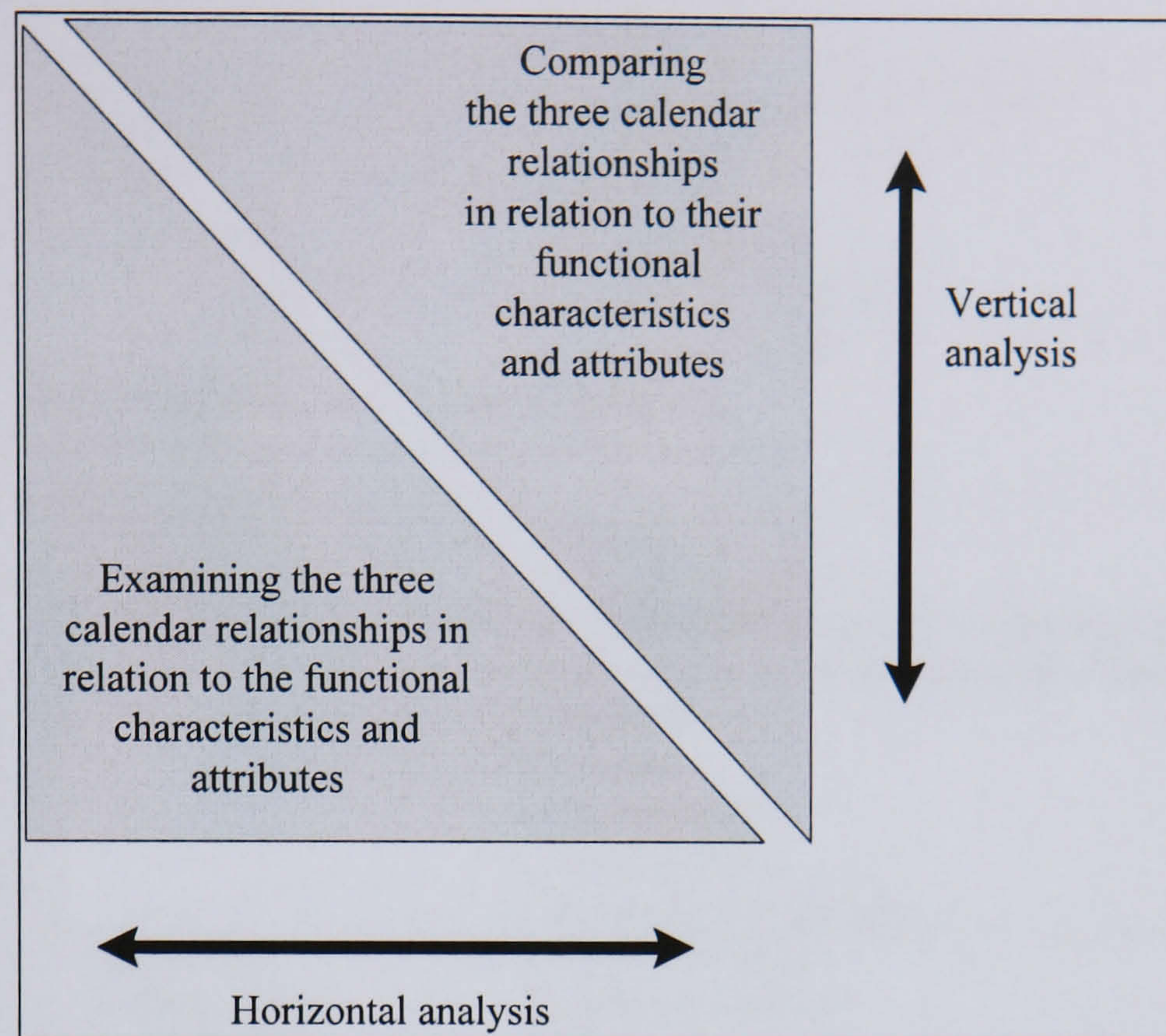
and characteristics of work needed by different calendar relationships and secondly, that there is conflict between the relationships and within the process. For example, 'ICR' of GCS is closely related to the process of supporting personal calendaring however 'CCR' and 'CoCR' of GCS is related exclusively to supporting public related work. This explains that the understanding of these three calendar relationships is a key to the discussion of the private and public concepts.

5.7.3 Implications of the interrelationship and interplay between the three calendar relationships

Having established clear differences between the functional characteristics of the three calendar relationships in the above section, the aim of this section is to focus on the GCS attributes in terms of the different calendar relationships and their functional characteristics in order to examine the interrelationship and interplay between the three calendar relationships. Chapter 2 has discussed the issues of GCS and developed the classification of the attributes of these issues (see section 2.4.2).

The developed GCS adoption model (DIAGRAM 2.1) base on the GCS literature depicts the relationships of the GCS attributes. The relationship between the attributes and how the interrelation contributes to a temporal coordination are not clear in the model. However, these are needed to be explored and examined in order to understand the underlying conflicting private and public perspectives in GCS. This sub section examines and explains the implications of the interrelationships between the three calendar relationships, the functional characteristics and GCS attributes identified in the M-SCOT framework. The comparative work is done in two directions; horizontal and vertical, described in the diagram below (DIAGRAM 5.13).

DIAGRAM 5.13
Analytical framework



The horizontal and vertical analytical framework was applied to the reading and understanding of the table below (TABLE 5.4) in order to make sense of the relationships between the three aspects (three calendar relationships, functional characteristics and attributes) of the phenomenon of GCS. The table locates the GCS attributes, identified using the M-SCOT framework in relation to the three calendar relationships and the functional characteristics.

The GCS attributes identified in the case study data are grouped into each functional characteristic first and then the functional characteristics are positioned according to the calendar relationship. Then using the analytical framework of diagram 5.13, the interrelationship between the three calendar relationships is studied.

TABLE 5.4

Cross examination of the phenomenon of GCS

GCS calendar relationships	Functional characteristics	GCS attributes (M-SCOT framework)
'ICR'	Supporting Personal Calendar	Calendar needs Calendar habits Privacy Temporal control

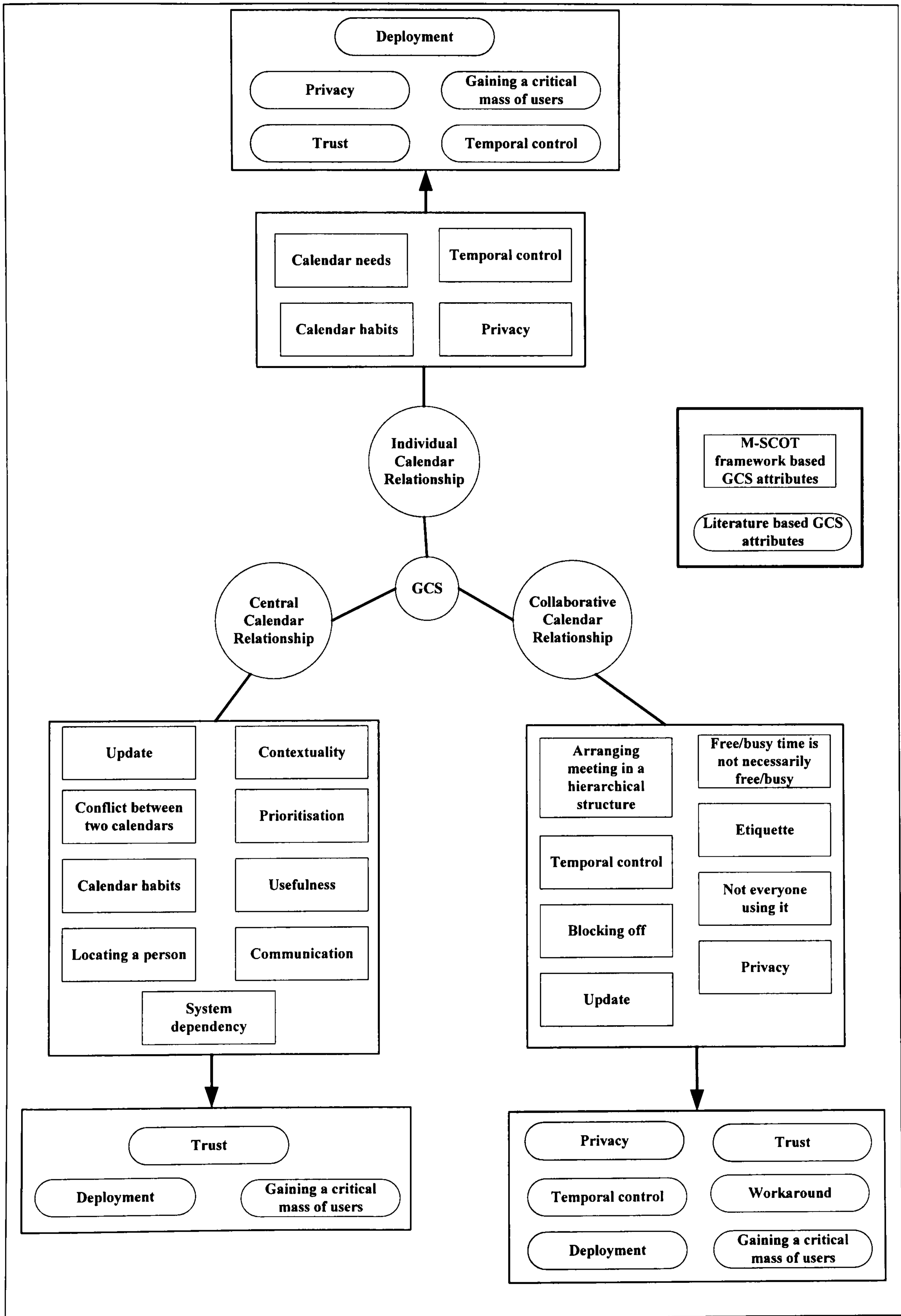
'CCR'	Supporting Communication Accessibility	Communication Locating a person Update Contextuality
	Supporting Distributed Work Coordination	Conflict between two calendars Prioritisation Usefulness Calendar habits System dependency
	Supporting Distributing Calendar Information	Locating a person Update Contextuality
'CoCR'	Supporting Meeting Arrangement	Privacy Temporal control Arranging meeting in a hierarchical structure Free/busy time is not necessarily free/busy Etiquette Update Contextuality Blocking off Not everyone using it
	Supporting Communication Accessibility	Communication Locating a person Update Contextuality
	Supporting Distributed Work Coordination	Conflict between two calendars Prioritisation Usefulness Calendar habits System dependency
	Supporting Distributing Calendar Information	Locating a person Update Contextuality

The table distinguishes and elucidates the three distinctive GCS characteristics which are represented as the three calendar relationships. It shows that the functional characteristics and the GCS attributes are clearly identified according to the three calendar relationships. The GCS attributes in the third column provide themes and examples to be used in the discussion below as well as in Chapter 6. The overlapping functional characteristics and the attributes demonstrate the multi-dimensional aspects of GCS and the fact that although they have a commonality of function, their usages are different.

The diagram 5.14 below represents the grouping of the GCS attributes found in the case study data using the M-SCOT framework in relation to the GCS attributes that were classified from the GCS literature. The M-SCOT framework has identified design attributes however these are not presented and discussed in this work, as explained in

sections 2.4.3 and 4.2. The interest of this research is on the social rather than technical mechanism of the temporal coordination. One other missing attribute is ‘training’ which this research has not focused on despite the fact that it has been argued that in order to increase the use of GCS, good training and support are required (Mosier and Tamaro, 1997). Section 4.2 also discussed an aspect of ‘training’ attribute. Nevertheless, the decision of not to include the ‘training’ attribute was made as ‘NetCal’ had been adopted for over five years in ‘SCS’ and three years in ‘CIM’. It is deeply embedded in their work practices.

DIAGRAM 5.14
Comparison of GCS attributes between the literature and the M-SCOT framework



This pictorial representation in diagram 5.14 shows a set of the relationships of the M-SCOT framework data analysis and the classified GCS literature attributes. Table 5.4 provided the attributes of each calendar relationships and these are compared with these of the literature to see if the set of literature attributes need to be modified. This revealed firstly that due to the broadness and inclusiveness of the literature based GCS attributes, the data did not show any additional attribute to those already classified from the literature and secondly, it showed the associated attributes of each calendar relationship. In the table 5.5, the three calendar relationships and their associated GCS attributes are summarised and put into a table.

This has to be noted that for example, the ‘gaining a critical mass of users’ attribute appears to be the characteristic that transcends all three calendar relationships, but each calendar relationship has different issues associated with of the ‘gaining a critical mass of users’ attribute. For ‘Individual Calendar Relationship’ (ICR) and ‘Central Calendar Relationship’ (CCR), the issue is centred by the need of individuals to maintain their calendars on-line and the realization of the benefit of using GCS. However, for ‘Collaborative Calendar Relationship’ (CoCR), the issues are different that it emphasizes the tension between the need of individual and the need of group work support.

TABLE 5.5

The three calendar relationships and the GCS attributes

Three calendar relationships	GCS attributes					
	Deployment	Gaining a critical mass of users	Privacy	Trust	Temporal control	Workaround
‘ICR’	✓	✓	✓	✓	✓	
‘CCR’	✓	✓		✓		
‘CoCR’	✓	✓	✓	✓	✓	✓

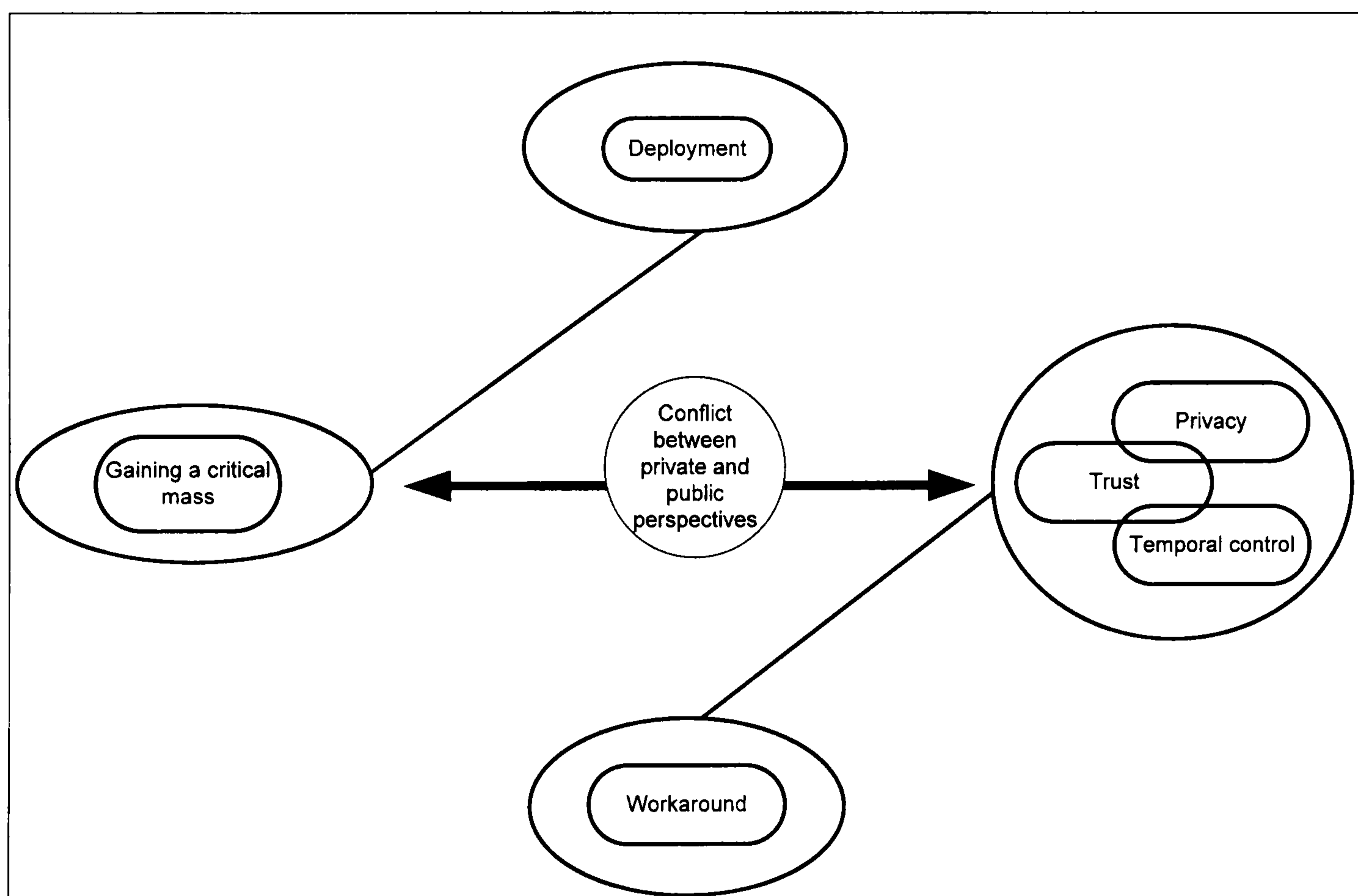
In the next section, the temporal coordination model is developed, taking into account this dynamic interrelationship of the attributes.

5.7.4 Temporal coordination model

The discussion in this chapter led to diagram 5.15 below. The model is based on the analysis of the interrelationship and interplay between the GCS attributes. It presents a

process of the temporal coordination of GCS, underscored by the conflicting private and public perspectives. The model explains the supporting role of deployment in terms of gaining of a critical mass of users for the adoption of the system. A critical mass of users invokes privacy, trust and temporal control issues in that GCS usage has to address these and overcome the underlying private and public conflict. The individual has to trust control over their time and privacy to the public realm which initiates the workaround. The workaround attribute signifies a means for both private and public perspectives to utilise sense making of the conflict for temporal coordination.

DIAGRAM 5.15
GCS temporal coordination model



In addressing the research question, the nature of the GCS temporal coordination, the question which has to be asked is how these conflicting private and public perspectives are accommodated in order to facilitate the process of temporal coordination of GCS. This question is the subject matter of the following chapter.

5.8 Summary

This chapter utilises the progressive research approach to confirm and refine the findings of Chapter 4 and also to compare with Chapter 2. The outcome exposed and firmly positioned the conflict of private and public perspectives as underlying concept that is required to be examined for the study of temporal coordination of GCS.

Using the semi-structured interview, the case study data was analysed by the M-SCOT framework and the pattern-matching technique. The analysis demonstrated firstly the suitability and applicability of the M-SCOT framework through its operationalization. Secondly, it provided the groundwork for the further investigation of the nature of the temporal process of GCS. The temporal coordination model introduced in section 5.7.4 emerged out of three progressive research stages of confirmatory and comparative layering of analysis. Firstly, the three calendar relationships were confirmed and positioned firmly in the data. Secondly, these three calendar relationships were set against GCS functional characteristics (see section 2.4.1) in order to confirm the literature study in terms of the classification of the functional characteristics and also to confirm the processes of the three calendar relationships, described in section 4.4. The analysis revealed the differences in function of each calendar relationships in that each of these three calendar relationships carries, performs and requires different processes. The last layer of analysis established and related the set of attributes to the five functional characteristics that are grouped into the three calendar relationships, by investigating the issues that can be found in the process of each functional characteristic.

This comparative work firmly positioned and confirmed the findings of Chapter 4 of the conflicting and yet, co-existing private and public perspectives of GCS in the temporal coordination. This chapter ended with the temporal coordination process model that emerged out of the layers of analysis. In the next chapter, the private and public conflict in the process of temporal coordination is examined and discussed further to see the working of conflict and the ways in which it is negotiated.

CHAPTER 6

The GCS phenomenon: the state of reflective temporal equilibrium

6.1 Introduction

Chapter 6 further discusses the conflict phenomenon between the private and public perspectives found in the temporal coordination process of GCS that emerged from the literature work in Chapter 2, confirmed and further conceptually developed by the research in Chapters 4 and 5. The purpose of this chapter is to examine the dynamic relationship between the private and public, two conflicting perspectives locating them within the process of temporal coordination using the M-SCOT framework analysis (see APPENDICES C.3 and C.4).

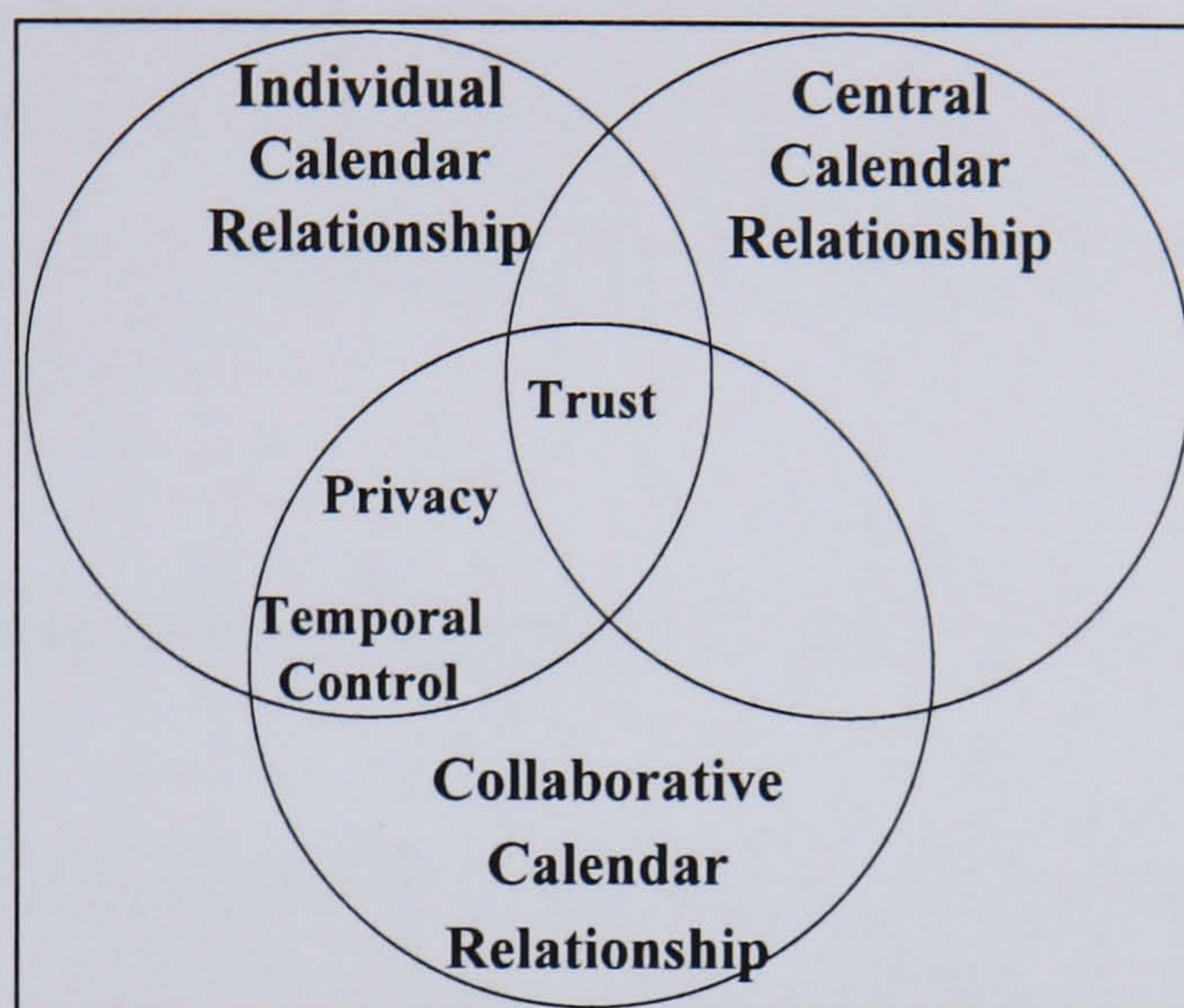
This chapter begins with a brief discussion of the ‘trust’ and ‘temporal control’ attributes as key contributing influences involved in the study of the temporal coordination. The chapter then proceeds to section 6.3 to discuss the ‘trust’ attribute. The ‘trust’ attribute in GCS-in-use is characterised as ‘blind trust’. Then, the ‘temporal control’ attribute is discussed in 6.4, introducing the concepts of ‘control-with’ and ‘control-over’, which assist in the examination of the dynamic relationship between private and public perspectives. The chapter ends with a discussion on the development of the ‘reflective temporal equilibrium model’ which presents the state of the temporal coordination of GCS and a summary.

6.2 Studying ‘trust’ and ‘temporal control’ attributes

The temporal coordination model (see DIAGRAM 5.15) showed the interrelationship of the GCS attributes, highlighting the on-going conflict between the requirement of the need to gain a critical mass of users on the one hand and the challenges of individual privacy, temporal control and trust face on the other. The M-SCOT

framework analysis revealed these three attributes in relation to the three calendar relationships (see TABLE 5.5) and this is presented in the diagram below.

DIAGRAM 6.1
Positioning 'trust', 'privacy' and 'temporal control' attributes



The particular interest here is on the GCS attributes that interrelates between 'Individual Calendar Relationship' (ICR) and 'Collaborative Calendar Relationship' (CoCR). It is when the 'ICR' is required to support the public needs and 'CoCR' is required to support private needs, 'privacy' and 'temporal control' emerge as the attributes of GCS. 'Privacy' has been identified as an attribute in the literature as a clear issue in gaining cooperation (see TABLE 2.3) and also in the analysis of the case studies (see section 5.5). However, the case studies sites in this research are largely based on the 'free/busy' GCS setting, therefore, this chapter pays particular attention to the 'temporal control' attribute which mediates 'ICR' and 'CoCR' in order to explore the workings of the 'temporal control' attribute in the dynamic relationship between private and public perspectives.

The next section discusses 'trust' in its role in supporting and underpinning the three calendar relationships in order to help to understand the nature of the private and public conflict and its implications on the design and adoption of GCS. It focuses on the temporal aspect, as a foundation and a requirement for GCS adoption in any organization as GCS requires the users to open up their calendars to others and trust can only be sustained through social understanding and learning the so-called, correct

‘conventions of diary use’ (see TABLE 2.3). The ‘trust’ attribute as shown in the above diagram, underpins all three calendar relationships unlike ‘privacy’ and ‘temporal control’.

‘Trust’ and ‘temporal control’ are interrelated attributes but these GCS attributes are examined separately to build upon a model that depicts the dynamism between private and public perspectives at the end of this chapter. The following sections 6.3 and 6.4 demonstrate that the private and public conflict in GCS is a multi-dimensional and multi-layered phenomenon.

6.3 The conflict between private and public: from a ‘trust’ perspective

Trust underscores GCS design and its usage. As GCS requires people to give an access authorization to others, trust is considered as an important aspect for its successful adoption (Blandford and Green, 2001). However, as with other GCS attributes, despite its significance, it has not been explored in the literature further. The ‘trust’ attribute can be explained from two dimensions: vertical and horizontal as it is based on both a vertical trust relationship between the management and users and a horizontal trust relationship amongst users. The literature studies have made numerous suggestions of ways to help the adoption of GCS for example, familiarizing the user with the system through intuitive user interface and hide or simplify technological complexity (Beard et al., 1990; Mackinlay et al., 1994; Grudin and Palen, 1995; Mosier and Tammaro, 1997; Tullio et al., 2002). Better system design can indeed help with the successful implementation of the system. However, the need is not just to look at the interface of the system but to have a proper recognition of the actions taking place within the social context for example, the problem of encoding trust in GCS and building and sustaining trust which are discussed in the following sub sections. A notion of ‘blind trust’ is developed as a form of trust and a mechanism that bridges the conflict between private and public perspectives.

6.3.1 Encoding 'trust' into GCS: a lack of understanding of social context

Trust is a negotiated outcome of social interaction, a latent resource that acts in the reproduction of modalities of interpretive schema, resources and norms (Giddens, 1979) that these only get replayed and enacted upon in use. Chopra and Wallace (2003) synthesized a definition of trust from the IS literature and they concluded that 'it is the willingness to rely on a specific other, based on confidence that one's trust will lead to positive outcomes'. Although the definition gives wide latitude of interpretation, the problem of enabling trust remains critical for GCS in that it requires high vertical and horizontal trusts as discussed above.

The difficulty here is that GCS is codified by the designers with their understanding of what a calendar is supposed to be and do but when it is implemented in an organization, it has been disembedded from the context from which it was originally designed. The conventional ISD approach, found in the literature, posits that people are capable of instilling trust in technology that conforms to the model of 'I trust you', a social tie between a specific trustor and trustee (Chopra and Wallace, 2003). Trust is encoded into GCS as if it is fixed and static, lifted out of the context.

One of the examples that demonstrates the lack of context of encoded trust in GCS is to do with its inability to define group boundary. The need of grouping in a shared virtual working environment for trust building is beginning to gain recognition (see Patil and Lai, 2005; www.airset.com). In face-to-face interaction, we are in control of our calendar information, as well as any other information, which we annotate in the personal calendar. We give out 'censored' rationalized information to others, the release of information is politicized, operating on a 'need to know basis' whether it is verbal or in a text form, determined according to who the person is. The technological system does not offer confidentiality which allows people to group others as we do in face-to-face relationships according to their trustworthiness. Encoded trust in GCS fails to encapsulate what is required in a social relationship.

The second example of the lack of context of the encoded trust is the fact that the notions of 'free' and 'busy' require reconsideration in GCS. The GCS literature has

also noted that free time is never really free (Ehrlick, 1987; Grudin, 1988; Blandford and Green, 2001). 'Free' and 'busy' are encoded into GCS as a trusted fact but it fails to understand the use of free time in its contextual sense. The incident at 'SCS' demonstrates this. One of the newly appointed lecturers, we call 'Joan' (pseudo-name) received a meeting request from the division leader. The division leader had checked the availability of 'Joan' before sending the meeting request to her which showed the time slot as 'free'. However, 'Joan' declined the meeting as the time slot requested was before the first lecture she had to give and she wanted to spend time preparing it. 'Joan' declined the meeting request with an explanation but later when she bumped into the division leader in the washroom, the division leader made it very clear that she was not happy that the meeting request was declined while the calendar said 'free'. This requires a defensive calendaring approach in order not to appear to be 'free' for meetings and to also avoid such confrontation with others when information given out through GCS is regarded as a trusted fact.

However, the defensive calendaring, 'blocking time off' practice has led to questioning of the trust relationship. One of the senior management perceived the practice of people blocking their calendars off as a necessity in order for the uninterrupted and productive work process. However, the 'blocking time off' practice raises a new issue of 'are you really busy?' Due to the practice being widely recognised, a fully filled calendar can be seen as questionable which generates a phone call or separate email contact. The wide perception of both case study sites was that a busy calendar does not necessarily mean that they are truly busy. The example of 'busy' is not necessarily 'busy' is given by a lecturer 'James' (pseudo-name). He explained that he blocked some time off for his own research, otherwise, he would be inundated with meeting requests. However, he has three research students that he opened his calendar to. As his calendar is full, the research students tend to book a meeting infrequently whereas he prefers to meet the research students much more frequently. His individual needs and preferences are in conflict with the needs of public. For example, his need of having an uninterrupted continuous time for his own work is in conflict with his wanting to have an easy way of arranging meetings with his students using GCS as his need of frequent but short meetings with his research students is not supported in an environment of defensive calendaring practice.

Defensive calendaring practice may be used to create a trusted working environment and to overcome the lack of its contextuality as a way to verify 'free' is in fact 'free' and 'busy' is in fact 'busy'. However it advertently led to a questioning of the trust relationship as 'busy' may not mean truly 'busy'. This is due to the fact that GCS does not support the grouping as we would normally do in social environment. There is a need of understanding and recognizing the lack of contextuality in GCS as it has a direct relation to the trust attribute, in particular, building trust.

6.3.2 Building 'trust': personal and organizational trust

For any groupware to work, it requires a critical mass of users (Palen and Grudin, 1997). The literature suggests that the critical mass could be achieved by either top-down (Markus and Connolly, 1990) or peer pressure (Grudin and Palen, 1995) or a combination of these two implementation strategies (Brown and Crawshaw, 1998). In GCS, trust relationships can be characterised into two, as personal (horizontal), and organizational (vertical), these are embedded in the daily operations and are enacted in the day to day calendaring relationships, it shapes, and is shaped by, everyday interactions. On the personal level, people expect their colleagues to use GCS and also the actor has to trust others, for example that everyone's calendar information is up to date. At an organizational level where the trust relationship is societal, actors in the organization have to trust the working environment that their use of time is not judged as a representation of their work ability. In this way, GCS is acting as an enabler to building trustworthiness in working relationships. This process enables new social relationships to emerge and form a new set of expectation in norms of behaviours.

However, some will not trust their colleagues' calendars as seen in the example of fully filled calendar above and some will not trust their management as it can be a tool for the managers to observe a subordinate's calendar use to inform him/herself about the employee, leading to a sense of 'big brother is watching'. A trust relationship is invoked through the GCS usage that people have to have trust on others that their temporal information and other information in the calendar will not be abused.

Trust in GCS can be explained by the concept of 'blind trust'. People 'feel' compelled to use it in a self-regulated way to comply with the company's norms. The uncertainty and doubts lead to 'blind trust' of compliance. This thesis proposes that 'blind trust' is a form of trust that is characteristic to GCS adoption as an enabler of bridging the private and public perspectives.

6.3.3 'Blind trust': bridging private and public perspectives

The analysis of the case studies in Chapter 5 revealed two types of GCS adoption: first, the top down adoption (case study one) and second, reciprocal benefit adoption (case study two). The case studies also revealed some initial resistance from the GCS uptake, reflecting its social and political ramifications. The adoption of GCS in these organizations can be characterised by the notion of 'blind trust'. The explanation of 'blind trust' is that; we in general, comply with the social environment that we create because we are 'forced' to take such an action but we also comply because we do not know otherwise. There is no option but to comply because of the norms and values learned throughout our lives. We accept the use of GCS because when it is imposed upon us whether through the managerial or peer pressure we in general comply with the organizational working practice, in this case, using GCS as a condition to be part of the group and these organizations.

As trust is embedded in the social environment, there are only two options for people to consider: first, having 'blind trust', which is compliance and second, rejection of using the system or refusal to comply. However, how many people actually can rebel? Refusing to work with the system in some organizations may lead to the result of losing a job. However, the case study revealed that the meeting acceptance button which updates GCS automatically by being pressed, acts as a shield for people who refuse to use the system properly. This allows such people to be seen to others like they are using the system and such usage is termed 'phantom usage' as discussed in section 5.4.3.

Recapping, the literature perceived that there was tension between personal and organizational needs in GCS in that to some degree, personal needs have to be compromised (Payne, 1993; Mosier and Tammaro, 1997; Palen, 1998, 1999;

Blandford and Green, 2001; Mynatt and Tullio, 2001; Tullio et al., 2002; Lee, 2003). To overcome such conflict between private and public and achieve a critical mass of GCS users, all the participant have to have ‘blind trust’ in the system. Some may have confidence in GCS because simply they are familiar with the name of the product or have some kind of previous experience of using it, but for others, even the concept of GCS may be alien and need time to understand the basic functions. As both case studies show, whatever doubts and uneasiness there were towards GCS initially, it became a part of working practice, deeply embedded in everyday activity.

The decision to use GCS may not have been based on ‘I trust GCS’ but rather because they would not know otherwise or do not have the option. It can be said that people use it to conform to social pressure for example, ‘blind trust’ bypasses the conscious decision making process of considering the pros and cons and assessing the risks associated with their actions. The notion of ‘blind trust’ offers an insight into the phenomenon of the resolution of the conflict between private and public perspectives and also helps the understanding of the discussion in the next section. However, the workings of ‘blind trust’ require further investigation to elucidate its role and process in bridging the private and public perspectives.

6.4 The conflict between private and public: from a ‘temporal control’ perspective

Kling and Iacono (1984) argue that the adoption of CSCW tools to facilitate coordination and collaboration of work have control issues which are, ‘..exercised by many actors in a complex social fabric rather than simply through vertical management control or through lateral work relationships’. The GCS literature also recognized temporal control (ownership of time) as an issue that has to be resolved in order to support temporal coordination (Palen, 1998). The dynamic relationship between coordination and control is confirmed by Leavitt (1973), ‘if the coordination of people in time and space is critical, tighten your control’. However, temporal control has been conceptualized in the GCS literature as relating mainly to access control and privacy. This view of temporal control mitigates against a deeper understanding of the socio-temporal implications of GCS in organizations.

The characteristics of temporal control are presented through the discussions of the supporting examples of the two concepts ‘control-with’ and ‘control-over’, drawing on the work of Boland (1979). Two elements of the control concept can be distinguished as ‘control-with’ and ‘control-over’. ‘Control-with’ is the result of the interaction between individuals and technology through which an individual forms a set of rules and meanings and applies these norms to their actions. The users make use of GCS through adaptation and integration with their working practice. ‘Control-over’ is a top down imposed control process of procedures and rules related to hierarchically structured and bureaucratically operated processes. ‘Control-with’ and ‘control-over’ concepts are used here to examine different perspectives of ‘temporal control’ to understand the phenomenon of private and public conflict.

6.4.1 ‘Temporal control’ of ‘control-with’: ‘seizing time’ and ‘optimizing time’

Blandford and Green (2001) argue that GCS helps to increase a sense of control over a user’s time management by ‘revealing information selectively and by making decisions just-in-time’. However, the perception of GCS is that of a concern or fear over losing control over one’s time, therefore having the potential to indicate resistance to its adoption. As noted above, it was found that, as expected, there was resistance to the ‘new’ technology prior to adoption in the case study sites but this was quickly dissolved over time. There are two main dimensions in temporal control that the ‘control-with’ presents which are highly related to the individual’s time management aspect and demonstrate the active participation by the users in structuring the organization’s temporal structure. These are termed as ‘seizing time’ and ‘optimizing time’ strategies. The term, ‘strategy’ is used to explain their actions being intentional and deliberate. These are discussed respectively.

‘Seizing time’

The M-SCOT analysis showed that people blocked time off in their calendars because they wanted to have time for their own use without having an interruption. It also revealed that some people were reluctant to show a true picture of their calendars to others for example, how busy or free they were. The practice of ‘blocking time off’ acts as a defence as well as a pre-emptive mechanism. The interviewees typically

commented that they felt it was necessary to ‘block some time off’ to make sure other people do not fill their calendars up. This phenomenon turned out to be an accepted part of an organization’s internal practice and norms. Consequently, it was accommodated as an anticipated action in the daily activities amongst the users. Blocking time off is one of the examples of workaround practice which has a knock on effect on scheduling practice and working relationship. It can lead to follow up telephone calls and emails or increase in doubts and untrustworthiness as discussed in 6.3.1. This finding firstly confirms the existing literature where the effectiveness of GCS was compromised due to the practice of individual’s blocking-off large chunks of time (Brown and Crawshaw, 1998; Palen, 1998, 1999; Blandford and Green, 2001) through creating a fictitious appointment (Palen, 1998, 1999; Blandford and Green, 2001; Lee, 2003). Secondly, when viewed from the concept of temporal control, the ‘control-with’ perspective of his or her own personal use, the user had an active engagement in his/her temporal structuring through ‘seizing time’ as a part of their routine.

‘Optimising time’

The second strategy of the ‘control-with’ in ‘temporal control’ seems, at first glance, a counter intuitive phenomenon. In this case, users are able to exercise control over their time by deliberately either accepting or tentatively accepting requests for meetings while this may also mean that they are knowingly making double bookings. Although having a double booking function is a problem for the admin staff, this serendipitous feature of GCS is exploited as an information repository. This then allows and facilitates the users to be able to prioritize and legitimize the choice to which booking he or she chooses to attend. This might be a problem for the person who called the meeting as it is difficult to know then who is attending or who is not. Conflicting meetings are an inevitable part in any organization, which leads to the choice and the decision-making about which meeting to attend. From the individual user’s perspective, it is ‘control-with’ that the prioritization and decision-making are exercised at their convenience.

The ‘control-with’ is thus located with the user. Through their proactive actions of firstly, blocking, they are effectively controlling when others can and cannot make appointments with them and therefore, meetings are allocated according to their self selected pre-announced free time. Secondly, accepting or tentatively accepting all meeting requests means that the user can control the prioritization of events. This allows the user to control their calendar without the necessary mindful practice of negotiation.

6.4.2 ‘Temporal control’ of ‘control-over’: ‘temporal panopticon’ and ‘temporal conformity’

The ‘control-with’ of the individual perspective is mirrored by the ‘control-over’ by management, imposing the organizational temporal structure. There are two strategies in ‘control-over’ which emerged: ‘temporal panopticon’ and ‘temporal conformity’.

‘Temporal panopticon’

Perception of, and the nature of GCS is related to and compared to echoing that of panopticon. At one of the case studies sites, the need of ‘seeing’ was openly acknowledged as discussed in section, 5.4.1. For management, the advantage was clear and the effect of GCS is that of Panopticon. A British philosopher and social reformer, Jeremy Bentham developed a ‘model prison’ in 1791. This innovative architecture was adopted by Foucault as a metaphor for the operationalization of power through the ensuring the visibility of the spatio-temporal location of individuals (Ball and Wilson, 2000). For him, the ‘panopticon’ represents the way information is used in a modern society. Foucault (1991) explains the effect of the ‘panopticon’ as being ‘to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power’. With increasing concerns over monitoring workers, Foucault’s views have been adopted to see whether we are living in a world of electronic panopticon. There have been steady theoretical as well as empirical researches on the concept of panopticon in IT/IS (Zuboff, 1988) as especially for virtual organization, the control issue is one of the primary concerns for managers (Kurland and Egan, 1999). What people are worried about using GCS is the idea that their manager can see

their calendar without being seen through the network. There has been literature and empirical studies on the use of e-mail as a social control mechanism (Romm and Pliskin, 1998, 1999) but not yet in relation to GCS.

In spite of the initial perception of GCS as a surveillance tool, identified in the pilot study, discussed briefly in section 4.2.4 together with the head of school's aim to increase the visibility of employees and the initial resistance to GCS noted at one of the main case studies in the M-SCOT framework analysis, the analysis has not found any clear supporting evidence for temporal panopticon being operationalized. However, it has to be noted that the existence of the force to impose conformity of calendar practice and willingness to conform to it is in fact partly due to the effect of 'panopticon'. This research has identified the panopticon characteristics of GCS and future research into the effects and the operationalization of 'panopticon' is necessary, indicated here as potential future research.

'Temporal conformity'

One of the key findings of this research is that the adoption of GCS helped to reinforce the existing hierarchical relationships of the organization through the setting the normative process of GCS usage (see section 5.4.1). GCS acts as a means to promote and encourage conformity in the organization, based on the notion of 'blind trust' discussed above. Temporal conformity refers to the ways in which people conform to the group practice related to calendaring and scheduling. This phenomenon of conforming is also seen in the research domain of decision-making, where it has been widely acknowledged that there a pressure on the individuals as members of group to conform to group norms (Janis, 1982).

Any coordinated activity demands conformity (Doob, 1971) and this can be seen clearly in GCS. The first example is where the management (including the secretaries) use it in their routines and daily practices to 'impose' conformity in the calendar norms and practices as discussed in section 5.4.1. The second example is when management initiates an appointment via GCS, using displayed temporal information of the subordinate and then the meeting is subsequently declined; the rejection to attend was seen as deviant from the expected organizational norms as the details of the incidence

is described in section 6.3.1. These analyses show that this is an example of a management's attempt to structure the individual's time, the public interests crossing the boundary of the private by imposing a public temporal structure into what is previously known as privately negotiated and privately engaged realm. Therefore, failing to adapt this practice could result in conflict between management and subordinates. This issue has been recognized in the literature (see Blandford and Green, 2001; Ehrlich, 1987a; Grudin, 1988) even though this has not been conceptualised and discussed using the concept of conformity.

The concepts of 'control-with' and 'control-over' have provided the ground work to develop a model to show the relationship between private and public perspectives in the temporal coordination of GCS. The synthesis of the concepts used in this section is represented in a table below (TABLE 6.1).

TABLE 6.1
Analysing temporal control attribute

Private perspective		Public perspective	
'Control-with'	Seizing time	'Control-over'	Temporal panopticon
	Optimizing time		Temporal conformity

6.5 The reflective temporal equilibrium model and discussion

This research highlighted the phenomenon of conflict between private and public perspectives in GCS. Sections 6.2 and 6.3 have discussed this phenomenon from 'trust' and 'temporal control' perspectives in order to understand the dynamism of private and public in the temporal coordination of GCS. The discussions were based on the relationship between individuals and the management, reflecting the conflict between private and public perspectives. The objective of this section is to combine the discussions above to introduce a model that depicts the state of the conflict between private and public perspectives in the temporal coordination.

The model developed here borrows on the concept of reflective equilibrium by Nelson Goodman (1955, 1979) who discussed the relationship between inference and the judgement we make on that particular inference. He explains that we make a

judgement through continual interactions with inferences. This is a state of reflective equilibrium (even though Nelson Goodman has not used the term to describe the state) which is in continual interaction in order to accord with each other (Everitt and Fisher, 1995). The interest here is the realization of the state, neither as a static nor as a permanent point of closure but continually changing through interaction. This basic interactional aspect of the concept of reflective equilibrium is applied to the realization of the conflict between private and public perspectives in the GCS phenomenon. Reflective equilibrium represents a state of stable GCS usage in the organization that GCS becomes part of working practice and certain norms and values are established among users. However, these norms and values are continuously formed and reformed. Both case study organizations where GCS has been used for over five years are in a state of reflective equilibrium such that the phenomenon, underpinned by the conflict between private and public perspectives, is realized through negotiation and renegotiation between individuals and between individuals and the management. In order to focus on the temporal element and perspective of the discussion, it is rephrased as reflective temporal equilibrium.

6.5.1 The ‘reflective temporal equilibrium model’

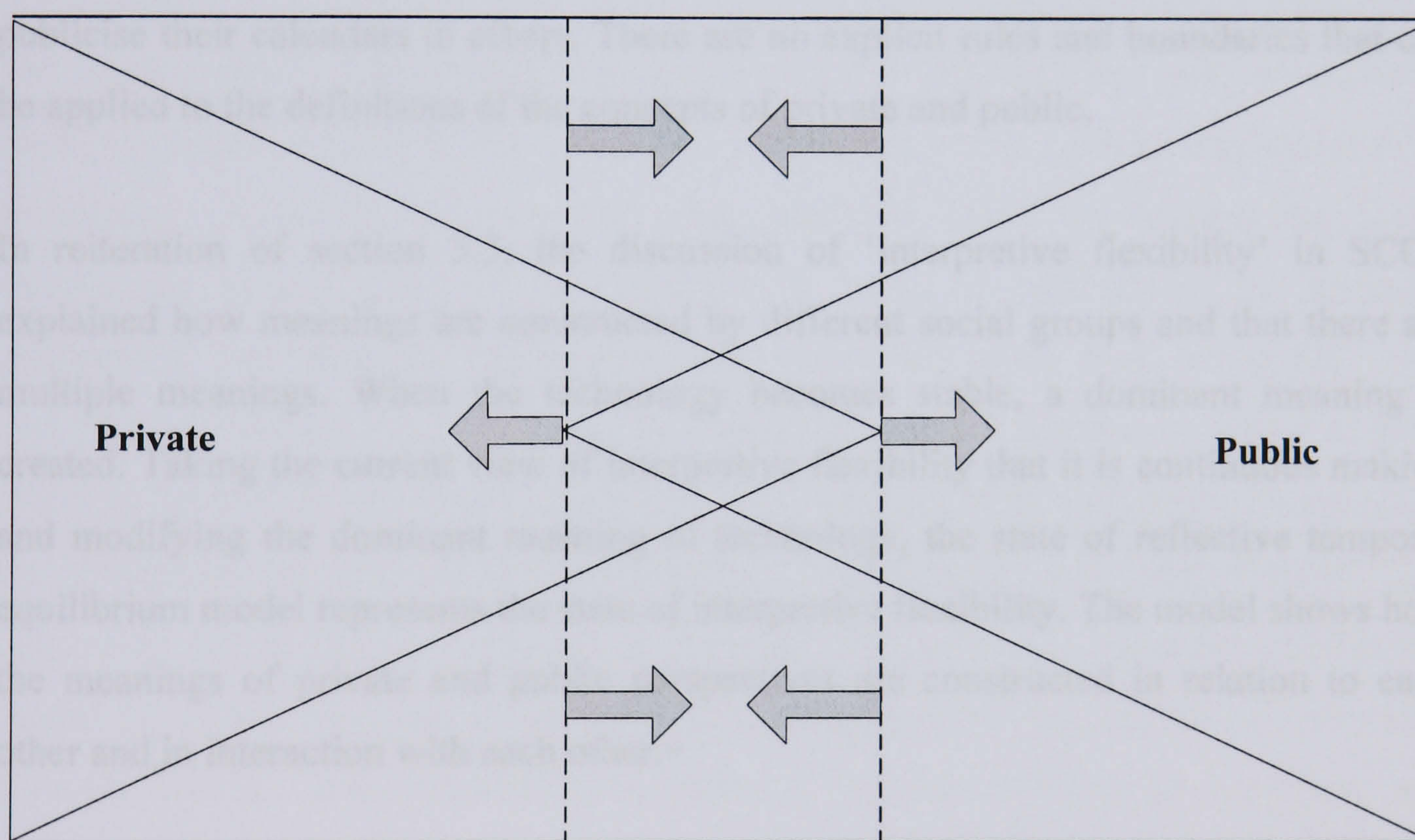
The work of this research focused on investigating the underlying concept involved in the process of the temporal coordination of GCS. The uncovered phenomenon of the evolving conflict between private and public perspectives in the process of temporal coordination in GCS is derived from the two GCS adoption requirements. For GCS to be utilised: first, the system has to support individual as well as group work and second, a GCS requires individual’s willingness to publicise what is generally considered to be ‘private’ information.

In the section 6.4 above, the two concepts, ‘control-with’ and ‘control-over’ were applied to the data to comprehend the dynamic relationship and conflict between private and public perspectives. ‘Control-with’ shapes one’s own ‘time-management’ strategy. This proactive strategy is employed to extend ones own ‘time-management’ strategy out into the organizational working practices. This is where individuals are involved in organizational temporal structuring through ‘seizing time’ and ‘optimising

time' strategies. However, the perspective of 'control-over' represents the management's making use of GCS, utilising what GCS does. 'Temporal panopticon', the notion of monitoring and surveillance, underlies the 'temporal conformity' strategy which coerces the users into following the work practice of the organization, colloquially, 'the way we do things around here'.

These contrasting perspectives have been developed into a model to represent a state of reflective temporal equilibrium (DIAGRAM 6.2). The private and public perspectives which are inherently different, are in a state of continual tension but working in accordance with each other which results in producing the temporal coordination.

DIAGRAM 6.2
Reflective temporal equilibrium model



This model signifies both private and public, pushing out to gain temporal control and the forces leading to the creation of a state of reflective equilibrium. It is a state of the temporal structuring at work, a continual exchange of the forces from both the private and public spheres. It creates the degree of latitude, the overlapping zone, in which reflective interaction and a continual dialogue take place between private and public perspectives. It is a state of fluid and dynamic relationships. The force of one side could be greater than the other in other organizations for example, highly structured

and hierarchical organization with an inflexible use of GCS could produce a public dimension pushing deep inside the realm of the private realm. If it is extended too far, consequently, it may result in an unsatisfactory working environment or the technology may fail to be widely accepted. The more the degree of latitude expands, the more dialogue of interaction and communication takes place. The state of the reflective temporal equilibrium model is context dependent. The conflict between private and public perspectives is in a state of continuous change and is required to be negotiated and renegotiated.

However, it has to be noted that private and public concepts are dependent upon the view point taken. The elements that constitute the concept of private may be acceptable for one person, but not necessarily for another, for example, working hours are considered for some 'public' in that they are either willing to or compelled to publicise their calendars to others. There are no explicit rules and boundaries that can be applied to the definitions of the concepts of private and public.

In reiteration of section 3.3, the discussion of 'interpretive flexibility' in SCOT explained how meanings are constructed by different social groups and that there are multiple meanings. When the technology becomes stable, a dominant meaning is created. Taking the current view of interpretive flexibility that it is continuous making and modifying the dominant meaning of technology, the state of reflective temporal equilibrium model represents the state of interpretive flexibility. The model shows how the meanings of private and public perspectives are constructed in relation to each other and in interaction with each other.

The study found that GCS spanned from private on the one hand and public on the other, bridging them to offer a tool that enables asynchronous temporal coordination in a virtual environment based on continual interaction and conflict. It is an on-going enacted phenomenon instigated in interplay between private and public perspectives underpinned by 'blind trust' that results in the realization of mutual benefits through which new working practices are formed. This enactment shapes the organizational temporal structure and also helps to structure working practices and relationships.

6.6 Summary

The aim of this chapter was to explore the phenomenon of conflict between private and public perspectives in order to understand the construct of the process of temporal coordination of GCS. In so doing, the attributes of GCS, ‘trust’ and ‘temporal control’, have been discussed. Trust was discussed as a foundation and as a requirement for GCS adoption. Section 6.3 introduced the term, ‘blind trust’ to illustrate the difficulties and problematic nature of GCS adoption and also as a form of trust that bridges private and public perspectives.

Having recognized the aspects of ‘blind trust’ in GCS-in-use, the next step for the research would be to develop a generic trust model which can be applied to other systems in order to recognize different instigations and patterns of blind trust. Section 6.4 discussed two concepts of temporal control found in GCS in-use, ‘control-with’ and ‘control-over’. ‘Control-with’ is categorised into ‘seizing time’ and ‘optimizing time’ strategies, indicating the norms that individuals create through interaction with technology. ‘Control-over’, on the other hand, is based on hierarchical social relationship among users. It is explained in terms of two strategies: ‘temporal panopticon’ and ‘temporal conformity’. The individuals move from seeing GCS as a tool to ‘control them’ (control-over) to a situation where it becomes a tool that helps ‘them to control’ (control-with) their time. The analysis of these aspects demonstrates the dynamism of temporal control between ‘control-with’ and ‘control-over’. The discussion led to the development of a model. The reflective temporal equilibrium model represents the state of temporal coordination which is continuously evolving through conflict and negotiation. Chapter 7 provides firstly, an overview and recapitulation of the thesis, secondly, the IS implications of the findings and finally, the discussion and directions for future research.

CHAPTER 7

The IS implications and discussion

7.1 Introduction

The aim of this thesis was to investigate the nature of the GCS process of temporal coordination using both grounded and progressive research approaches, enabling the capturing and exploring of the issues of GCS-in-use. The findings of Chapter 6 led to the development of a ‘reflective temporal equilibrium model’, presenting the dynamic interrelationship between private and public perspectives which underpin the temporal coordination of GCS.

This chapter is comprised of two sections. The first section summarises the chapters in this thesis and their findings, reflecting upon the three broad research questions and objectives described in section 1.3. The second section discusses the IS and ISD implications, focusing on the future design and strategies for implementation and adoption of GCS. This section further discusses the research contribution illustrated in section 1.5 which includes an evaluation of the M-SCOT framework as an analytical method for studying GCS-in-use and also its implication for future IS research. The chapter concludes with a discussion of the issues that were encountered during the research, and with suggestions for the directions for future research.

7.2 Examining temporal coordination of GCS

Chapter 1 ‘*Overview*’ provided the context and the rationale for the research question. Increasingly organizations adopt the virtual environment, facilitated by ICT and consequently, there are changes in working practice, relationships and processes which have led to the need for an increase in coordination of work. This chapter introduced the research interest in GCS, which are designed to support the temporal coordination of a geographically and temporally diverse workforce. The specific

interest of the study is to understand the dynamic relationships involved in the temporal coordination in a virtual environment. Having established the context and the rationale of the research questions, this chapter also presented the objectives and an overview of the thesis.

Chapter 2 '*Literature at work: exploring the phenomenon of GCS*' began with a brief examination of some of the characteristics of the calendar, the political and social nature of the calendar and our desire to manage and control time. This positioned GCS within a wider context of the calendar and also help understand the nature of the social issues of GCS-in-use. Chapter 2 then moved on to a critical examination of the current literature and understanding of GCS. The work of the literature review was two fold: first, the classification of the GCS functional characteristics and second, the classification of the GCS attributes. These were the underpinnings of the study of the process of temporal coordination as they provided the 'what' and 'how' of the construction of the process. These were used in the later chapters 4, 5 and 6 to compare and contrast with the case study data to help the development of the 'temporal coordination model' (DIAGRAM 5.15) and the 'reflective temporal equilibrium model' (DIAGRAM 6.2).

Chapter 3 '*Research design: building a research framework*' outlined and justified the research perspective and method adopted for the data collection and analytical techniques used in this thesis. There are two perspectives that underscored this research: first, a 'grounded approach' catering for the themes and issues to emerge out of the data and second, a 'progressive research approach' which allowed the findings of each stage to inform the next stage, tightening the focus of the research and construct theoretical concepts. The case study method was adopted to examine the actions and processes of GCS-in-use and the research design progressively refined and reflected upon the findings from two stages: stage-one, two pilot studies and stage-two, two case studies. The semi-structured in-depth interview was used as a primary data collection technique, supplemented by observations, questionnaires, documentation and photographs. The collected data was then analysed using the modified SCOT framework (M-SCOT) and the pattern-matching techniques. The 'SCOT' framework was modified to capture the social and design issues of GCS-in-

use and to examine the dynamic process of temporal coordination of GCS. The pattern-matching technique enabled validation of the findings through continuous comparison work. This chapter ended with the research and analysis framework, presenting the logical flow of the research and the techniques used.

Research Question One: How do people utilise GCS in organizations?

Chapter 4 '*Pilot Study: proceeding with the research framework*' addressed the first research question, 'how do people utilise GCS in organizations?' and reported the findings of the two pilot case studies which are comprised of two stages. Stage one was designed to capture the general usage of GCS and confirm the GCS attributes using questionnaires. However, in the follow-up interviews, it was revealed that different perceptions and usages of GCS existed. It also highlighted the need for these different calendar relationships to be investigated, consequently, the questionnaire research approach was deemed no longer suitable. After reviewing the findings of stage one of the pilot studies, the results were fed into stage two, acting as a prompt for further investigation which consisted of an in-depth interview study. In the second stage of the pilot study, the interviews took place with both GCS users and non-users in a variety of organizations, firstly to understand the different perceptions and usages found in stage one and secondly, to capture, confirm and extend the GCS attributes. Interviewing non-GCS users was considered important in this stage for two reasons. Firstly, it was to support the finding from the first stage which suggested that GCS was used as a personal calendar. Consequently, it was necessary to study such calendar usage in order to construct the characteristics. Secondly, studying non-users could provide a valuable insight into the GCS attributes in relation to the context of calendars in general.

The findings revealed three calendar relationships: 'Individual Calendar Relationship' (ICR), 'Central Calendar Relationship' (CCR) and 'Collaborative Calendar Relationship' (CoCR). The categorization of these three calendar relationships confirmed the premise which was initially constructed in Chapter 2, using the study of the literature that: the conflicting private and public perspectives underlie the dynamism of GCS. The relationship between private and public conflicts was

discussed through the GCS relationships matrix and the calendar negotiation matrix. The work of Chapter 4 was two fold. First, it prompted a further in-depth case study using the interview technique to investigate the socially embedded process of temporal coordination and the underlying phenomenon of the private and public conflict. Second, it identified the need of a research technique to analyse a dynamic social environment.

Research Question One: How do people utilise GCS in organizations?

and

Research Question Two: How is the temporal coordination process of GCS enacted?

Chapter 5 '*Case studies: the process of temporal coordination*' continued to answer the research question, 'how do people utilise GCS in organizations?' and attempted to answer the second research question, 'How is the temporal coordination process of GCS enacted?' Chapter 5 therefore aimed firstly, to capture the functional characteristics and attributes of GCS, as a data-set to compare with and contrast against the literature, secondly, to confirm and validate the Chapter 4 findings of; the three calendar relationships and the social implications of GCS-in-use. The working of this chapter was to discuss, examine and explore the understanding of different GCS attributes and the way in which these interrelate to each other. This chapter demonstrated the operationalization of the M-SCOT framework which was applied to both case studies to uncover the social and design issues of GCS. The analysed data was set against first, the three calendar relationships and second, the functional characteristics and finally, the GCS attributes using the pattern matching technique to compare and contrast and also to validate the findings. This was to examine the multi-dimensional and multi-layered phenomenon of temporal coordination of GCS. The developed 'temporal coordination model' (DIAGRAM 5.15) showed the continuous social engagement of the private and public perspectives. This promoted further questioning about how the process of temporal coordination is sustained, prevailing over the conflicting private and public perspectives.

Research Question Three: How is the process of temporal coordination of GCS sustained?

Chapter 6 ‘*The GCS phenomenon: the state of reflective temporal equilibrium*’ discussed the working of the private and public perspectives using two interrelated GCS attributes: temporal trust and control in order to investigate how the temporal coordination in GCS is sustained. It was argued that trust is a key requirement for a successful GCS adoption and the chapter introduced the notion of ‘blind trust’ as a form of trust that could act as a bridge for the conflicting private and public perspectives. The temporal control was discussed using two concepts found in GCS-in-use: ‘control-with’ and ‘control-over’ to demonstrate the dynamism of private and public perspectives at work. Using these two attributes of GCS, the model of a ‘reflective temporal equilibrium’ (DIAGRAM 6.2) was developed to illustrate the continuously evolving state of reflective temporal equilibrium.

7.3 The IS implications: the research contributions

The thesis implications for IS research and ISD are examined in this section, elaborating and further discussing the contributions that are presented in section 1.5.

Classification of the GCS literature into two groups: functional characteristics and the GCS attributes. This will support future theoretical work and practical design of GCS.

From the analysis of the GCS literature, the thesis presented the classification frameworks of the functional characteristics and the attributes of GCS. These classification framework tables could be used as a basis to further the theoretical work and practical design of GCS in the future. For example, section 7.4 introduces some of the future research areas and these classification frameworks will help to theorize the comparison work between free/busy and open view settings (Discussion 1) and also provide a foundation for the future research on ‘blind trust’ (Discussion 5).

Introduction of the modified SCOT (M-SCOT) framework as an analytical technique which was adapted from Pinch and Bijker. The operationalization of the M-SCOT framework was demonstrated successfully in uncovering and examining social and design issues of GCS-in-use.

The M-SCOT framework demonstrated in this thesis through the operationalization was found to be a suitable research technique to capture the emergent themes and issues (see Chapter 5, APPENDICES C.3 and C.4). The M-SCOT framework offers the research advantage in presenting the data findings in a systematic way. It displays a clear relationship between the issues and solutions. The M-SCOT framework successfully demonstrated its capability to present and manage complex and multi-dimensional data. This has an implication for analysis in the wider IS research domain.

It provided a clear visual representation of the issues and solutions from one specific artefact perspective and also one specific 'Relevant Social Group' (RSG) perspective. In so doing, it broke down the complexity of the system-in-use into manageable segments for analysis from one group of actors' perspective. The M-SCOT framework helped to empirically confirm the different design needs for different social groups. The importance of the grouping was discussed in section 6.3.1. A social grouping is an important part of our lives and the accessibility of one's personal information could depend on who the enquirer is. There is a need for GCS to be flexible such that the various groups' needs could be accommodated to gain a critical mass of users. However, the mainstream GCS lack the recognition of the needs of the groupings which are continuously negotiated through evolving social relationships.

Formulation of three distinct GCS calendar relationships and uncovering their intertwined characteristics in their operationalization: 'Individual Calendar Relationship (ICR), 'Central Calendar Relationship' (CCR) and 'Collaborative Calendar Relationship' (CoCR). This recognition of the various perspectives within GCS enables a clearer theoretical picture of GCS which will help shape and inform its future design.

The current literature on GCS has failed to clearly identify different calendar relationships that exist within GCS-in-use. The categorization of GCS into three calendar relationships, undertaken by this study highlights the importance of contextualization that plays in the understanding of GCS. As discussed in section 4.4 and confirmed in section 5.7.1, each calendar relationship has a distinct calendar role, process and relationship with the user such that these differences need to be recognized and accounted for in consideration when designing GCS. For example, for the 'Individual Calendar Relationship' (ICR), it has to support the idiosyncratic usage of calendar, expression of the individualism and individual's privacy, protecting the identity of the user, if required or requested. These needs of 'ICR' have to be recognized and at the same time, design of GCS has to support group and organizational scheduling function of 'Collaborative Calendar Relationship' (CoCR) in that some degree of individual calendar information will have to be publicised in order to facilitate a group interaction.

This thesis examined the social interaction as it is the social issues that determine the design specification, unlike current software developments which tends to look from the technical interaction, by focusing on the user interface and functions, rather than the wider contextual aspects. The majority of the current GCS design requires the user to perform in a systematimised way of social interaction which results in workarounds.

The three contributions in the above text boxes highlight the need of having ranges and degrees of flexibility in system design such as Flexibility Analysis (FA) which has been suggested as a development technique interweaving the three components: technology, environment and organization together (Fitzgerald, 1990; Avison et al., 1995; Fitzgerald et al., 1999). The process of temporal coordination is constrained by social and political environments. Therefore, for groupware such as GCS to succeed, user requirements for GCS must capture the context and the social relationships within the organization.

Development of a GCS 'temporal coordination model', revealing the dynamic relationship between the GCS attributes involved and the underlying private and public perspectives, leading to strategy options for future implementation.

The 'temporal coordination model' of GCS (DIAGRAM 5.15) in Chapter 5 presented the GCS attributes and their interrelationships. It has an implication for understanding the adoption of GCS in the virtual working environment where coordination and collaboration of work is required and temporal control is highly desirable. These adoption criteria (see DIAGRAM 5.14) for GCS coupled with the understanding of the working of conflict and negotiation in adoption of GCS (see DIAGRAM 5.15) have a broader implication for the implementation strategy of such technology in an organization.

Development of a 'reflective temporal equilibrium model' to demonstrate the state of temporal coordination. The implication is for future implementation strategy of GCS.

This model (DIAGRAM 6.2) has an implication for the future use in assessing degrees of the adoption, penetration and influence of GCS in organizations. Assessments can be made using the model to evaluate and examine the current GCS usages and the relationship between management and their subordinates. The results of such an examination can help to enhance or modify the future design, or through adaptive maintenance, by adding or redesigning some of its functions to create an 'optimum', desired relationship, reflecting the organisational structure. For example, by redesigning the function of double booking in GCS (section 6.4.1), so that it will not allow people to double book, the balance between management and the subordinates can be shifted. This will result in reducing control people have over their time. People will have to make a decision there and then, rather than put it off and make a decision at their convenience.

7.4 Discussion and direction for future research

As the discussion on the thesis and the direction for future research are highly related these two are discussed together and presented below as seven discussions and in some cases with their implications and possible outcomes.

Discussion one: comparison study of GCS view settings

The 'reflective temporal equilibrium model' was interpreted as an 'optimum' relationship between the manager and the subordinate. This reflected the successful adoption of GCS in organizations with a balance of temporal control achieving without due overweighting towards one side. The balance of temporal control could be explained by the fact that a restricted view setting (showing only free/busy) offers individuals' privacy for their calendar contents in that it gives the users a degree and a sense of temporal control over their time while organizational temporal structure could also be implemented. An assumption can now be made that the restricted GCS view setting may be advantageous in catering for the needs of balanced temporal coordination in a virtual working environment. However, the case for successful adoption advocating the open view setting GCS (showing the content of the calendar) (Palen, 1998) would provide an interesting future research comparison case-study. The proposed research study would examine the open view settings to establish the implications of this setting upon the dynamics of temporal control between the manager and the subordinate.

Discussion two: cultural dimension

The first stage of pilot case study of Chapter 4 took place in South Korea. As the study was to gather an overview and the characteristics of the GCS attributes, the cultural difference was not considered to be a significant factor. The interest of this research was in the cross organizational comparison to see if there was a continuity of themes and characteristics of GCS. However, a cultural comparison of perception and usage of GCS and the implications for the 'reflective temporal equilibrium model' could provide a new dimension to the GCS research.

Discussion three: panopticon effect

The research identified the phenomenon of ‘panopticon’ to be one of the critical dimensions in the process of temporal coordination of GCS. Further research into the perception of the effect of GCS in the early stage of its implementation would provide a better understanding of GCS adoption.

Discussion four: the M-SCOT framework for IS research

The M-SCOT framework proved to be suitable for the research conducted in this thesis. However, adoptability and suitability of this framework for a wider IS research is needed to be explored for future research for example, the application of the framework to examine different technologies-in-use.

Discussion five: research on ‘blind trust’

The concept of ‘blind trust’ was developed in section 6.3 based on the GCS usage case study and literature. The next step would be to collect further empirical data to validate the concept in relation to its significance for ISD.

Discussion six: ‘reflective temporal equilibrium model’ in IS

The developed ‘reflective temporal equilibrium model’ was based on two pilot studies and two case studies findings. There are many organizational and other environmental enabling factors for the formation of the reflective temporal equilibrium. Different organizational working practices and different organizational structure may influence the dynamism. The next step would be to apply the model to other organizations that use GCS to see if this could be further validated. It also needs to be applied to the organizations using ICT other than GCS to see if the ‘reflective temporal equilibrium model’ is applicable.

Discussion seven: private and public conflict on the Web

The increase in the need for cooperation and collaboration of work across time and space, together with the growing use of web-based technology and the emergence of the paradigm of interconnected web weaving (Berners-Lee and Fischetti, 1999), have resulted in the proposal of seeking an alternative approach for designing GCS, for example, recognizing the need of social grouping as discussed in the implications above. The key aspect of future research needs to address is the ‘convergence of technology and contextuality’ (Jones and Spiro, 1995).

The phenomenon of the interaction between the private and public conflicts discussed in this thesis may be exclusive to GCS. The finding of this research could help to construct a framework for future research into examining the conflict between private and public perspectives of Web based systems and their adoption.

Endnote

This thesis conducted an enquiry into the temporal coordination of GCS focusing upon the dynamic relationship between private and public perspectives and their unlikely marriage. Like any relationship, the boundaries of private and public realms are being constantly challenged, changes occurring over time as other pervasive technologies question the dynamism and the sustainability of associations made in virtual environment.

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APPENDIX A

Data preparation

A.1 Comparison between a full transcription and a sentence summary

A full transcription

Explained what this interview was about briefly.

Q: How long has 'NetCal' been used at 'SCS'? (not recorded)

A: It's probably five years. I came back in 1997 and started some of changes in about 1997 and use of calendar is probably from 97 and 98.

Q: Maybe you can explain to me, how and why the decision was made?

A: I came back as a head of school. And, and I think practically nobody was using a calendar system, and maybe one or two but that was it. And I was sitting in my office, watching my admin staff trying to make an appointment. It consisted of telephone conversations went sort of like this. 'hello, this is X and I need to make an appointment with you and K and Q and okay, you can do it this day, this day and this day. Okay I will get back to you'. Then they go to K. and they spend another hour on the phone, then find out one person couldn't make any of the dates. And the other aspect was that okay we can look up on the board, you can see when people are teaching, but you know academics, that's fraction of their life, and they are all supposed to come in and fill it in after the conference, 'I've gone here' but they never did. So I took a decision, basically, I wanted to implement the calendar system, a 'NetCal' because I was using it and my office staff were using it, quite quickly and we pushed it out to the rest of the school.

Q: Okay. Somebody was telling me that 5 or 6 years ago, 'SCS' was trying to make a kind of image as digital 'SCS'. And does it coincide with that?

A: It's certainly coinciding with that idea. From a school's perspective, what we were trying to do was just to get a very good way of managing calendars, diary etc.

Q: How did you implement it? Was there any strategy or plan to do that or was it too trivial application?

A: Well, it is not trivial application. Getting people to adopt a diary system, calendar system is quite hard and even now I know it's not 100% in use. And basically because I was a head of school and everyone's line manager. If I decided to do something and I can make it happen which isn't the case in many universities. And also I was able to sell the benefits to all staff.

Interrupted by his secretary

A: So, strategy is too grand a word for it and I wouldn't claim that I have strategy for anything but I have plans and plans go on this case sort of discuss with the division leader and make sure division leaders were on board. Started to implement it by very simply starting to send people meeting requests and got to the stage where people were getting used to strange email messages come along and then people, computer guys to begin with, they work it out very quickly, 'what are we supposed to be doing, just happen and stick it in their diary'. Then moved to a situation where I made mandatory that all meetings, all activities are in diary so I could make an appointment with anybody.

Q: Okay. How did it go down with the division leaders, were they happy?

A: They were reasonably happy because they spent a lot of their time, running around trying to find staff for meetings. One thing we can guarantee about the academic institution is that there is no requirement for meetings so you know, spending half an hour phoning around, walking up and down the corridor, trying to find a date on everybody's diaries is just a nonsense. The other thing I did was I bought all the division leaders not this particular one (he showed his PDA) but the predecessor to Palm Pilot. And so they can sync the diaries. So they've got now electronic copy of diary and electronic diary in the machine which means, they've got a reason for keeping both up to date.

Q: The division leaders' diaries, as far as I know, are open to the administrators here. How did that decision come about?

A: Well, any of the administration staff can put an appointment into my diary. That's simple. One of the things that again, division leaders are like line managers but also deal with the program issues. And they will get students turning up and knocking on the door so generally what we decided again what we discussed, we agreed what was a good idea was to make their diaries open to the office staff so students could be told to come to the office to put an appointment in division leaders' diaries.

Q: So, privacy has never been an issue anyway?

A: Providing people could see a benefit and the benefit that division leaders saw immediately was they won't going to get lots of students banging on their door, 'can I make an appointment to see you?' Although, okay, students are still encouraged to send an email, it's much easier to say to students, 'Look, if you want to come and see me, go to the office, put an appointment in my diary and that will be it or email me and I will put it myself'. It means that you are no longer walking around with these 15 meetings in your head, you are supposed to remember and so they've got reasonable efficiency out of it. Some of them actually sit there actually tab into a Palm Pilot, but most of them say just go to the office. And if you want privacy within 'NetCal', you can always just, god forbid but if you have a doctor's appointment, you didn't want anyone to know about it, or let's say, you have a job interview, you didn't want anyone to know about, you can always put as a private meeting, you will not see the details, they will see it blocked out but they won't see you know what you block it about. We haven't encouraged staff to publish, there is a facility in which you can publish in website but we are not encouraging staff to do that. Someone may do it so there is a little bit of control, we have enough control so if you are happy about it. What I can say is that the engineers joined us in August, it may take some time to get them to do it.

Q: You said that the officers could write in your calendar. You must be inundated with the meeting requests, how do they know which one to put in and which one not to?

A: Well, basically, exactly same way as they accept meeting if I am clear and if I am not clear then they will ask and basically, a lot of the time, leave management of my diary to me so I can print out weekly basis and just see I look at say, 'look, I don't want anything in this space, here etc. Okay sometimes it goes wrong.

Q: So, they would accept a meeting request and you will go through which one you might like want to...

A: I am quite often I will accept a meeting request which...

Q: Well, I am here so (laugh)

Q: I have been talking to academic staff here and majority said to me that they were very happy with 'NetCal' but there is a view, it's a minority but they don't want to be managed in this way, as an academic they feel...

A: You've got no option because it is a managed institution.

Q: Do you see this as a management tool?

A: I think it's an essential part of an efficient administration system. I don't see it as a part of management, I don't sit there poring over people's calendars to find out what they are doing and when they are doing it, I just want to know that you know, if I want to make a meeting, I can send around the message and people have the option to say no.

Q: As you said, it requires people to change their calendaring habits because some people might have used a paper calendar for the last 40, 30 years. You are asking them to change it. How does that work?

A: In 1997, I tried to use an electronic diary, maybe 3 or 4 times and always given up and gone back to my A5 academic diary and it didn't work because I then had two incompatible diaries. One was in machine and a paper one which I carried around me. It actually works, if you have one diary and for that you need a device like this or something. In fact, I would encourage any academic member of staff who wants one, buy Palm Pilot. These days, it's relatively cheap. That makes it much easier. Each morning, it beeps me to tell me if I am suppose to be somewhere and makes a whole thing more transparent and easier to use. My bigger regret, if you want regret...

...is we never gone much further than a diary system. We do make use of the ability to send around the voting slip. And we used that several times when we wanted to get a quick poll. Trivial things like, we used to provide coffee in the staff meeting area and couple of other areas in school and we got a number of requests that we put a water cooler. We could have one or the other. I am not paying for both so we put a simple voting slip. The general balance of the vote was the water cooler and to have put around like a self evaluation document and asking people to vote whether they accept the document. That is slightly better than just sending out a straight email because we can actually see who has voted and who hasn't. I have tried using a task management system once or twice but that is harder and within 'NetCal', it isn't one of clearly strong features. It's little bit, it seems a lot of effort to me to allocate someone a task. And in academia, you don't allocate a task to one person but you allocate to several

but it doesn't seem to like that. The other problem we have is we end up issuing appointment request for things, I would describe as being standard academic calendar issues and again it is a weakness of a current version of 'NetCal' we are using so for example, I know when, we know in advance roughly when a course board will be, a subject board will be, a school meeting, a division meeting, there are whole host of things but at the moment, they are sent out individually as meeting request. This is a weakness because then a member of staff is physically having to go yes, yes, yes, yes and no, no, no. We had a look at something two years ago which was to create a central calendar which replicated into everyone's calendar but it didn't work. My understanding is that next version of 'NetCal', 2002 actually has a central calendar which I understand. That would be a great advantage for me, again it cuts down minor effort that staff has to do. Another regret, I still know staff do not make 100% use of calendar system. It is a very simple rule, if they don't turn up, they say because of they don't use a calendar, that's their problem, not mine.

Q: How important do you think it is to have this sort of system in the academic environment?

A: Very important. If you are going to allow people as much management which don't exist within an academic institution then there has to be a pay back. I am happy that academics feel they can almost plan their own life. That's fine but there is a certain time that I need to know I can call meetings or meetings can be arranged and what I don't have is because I have a very small admin team, what I don't have is time for an admin officer to sit there and spend a half morning phoning trying to get 10 people. So to get to keep the freedom they have, there is a requirement to take a responsibility to keep it up to date. The balance is that we never asked them to keep a time card, I never asked them to keep a timesheet. We can survive if they keep the calendar up to date. There is a nothing worse than a phone call and it looks so unprofessional, you pick up a phone to someone who say, is so and so in, and you go, don't know, when he will be in, don't know, and can I make an appointment to see him, hmm, ye, give me your number and I will...what will be your impression if you were phoning, let's say, BP's head office, and you got that, you will say, what a bunch of jokers.

Q: If I just ask your calendar, it seems to me that you don't manage your calendar. Admin staff manages your calendar. Are you confident?

A: Yes

Q: How long have you been working with them?

A: We had a complete change in August when my admin officer was promoted and went down to registry and last year, Audrey managed part of time and Rachel managed part of time and Wendy managed it part of time. I have the ultimate responsibility for making sure calendar works. And what I will do is, I will check it up and something has been put in and I am not happy with then I will change it.

Q: Do you also put your personal appointment as well?

A: It's quite easy. I don't have a personal life. I am rather sad individual. Yes, things like I've got a dental appointment and my wife's birthday are in there, my wedding anniversary is in there along with reminders. Put a week before to remind me to go and get a present, a card. That was put in by my previous admin officer whose got fed up reminding me the day before that it was my wife's birthday or it was my wedding anniversary.

Q: Right. And you don't mind sharing all that.

A: If I did, I just mark it as a private so no one to see it

Q: Just a last question. You have identified a scheduling problem within this school. Do you think that has been addressed, solved?

A: It's has been reduced. When I first came back, the school was about 35 academics staff roughly and about 4 admin staff and two technical support staff. Let's say, 40 staff all together. Now including researchers and research assistants etc. 115 staff. Has it have solved all the problems? No. but the one I definitely got rid of from the most of academic staff is that I can make an appointment and I know everybody is going to receive email which asking accept, decline and tentative and ends in diary system. Other than other parts of university, we don't have that problem anymore. I think my admin staff spends an hour every month, phoning around mostly when the external people are involved.

Q: Even though I said that was the last question, I just ask you a few more. Why do you think this school adopted and use 'NetCal' more than any other school at '?

A: Because I wanted it to happen.

Q: As far as I understand, you sent out email and nobody seems to really remember, apart from receiving one email, was that enough to make...

A: Yes. As I said, it is a managed institution so a line manager looks after 15 staff and I manage the line managers who look after academic staff. It is easier for me make something to happen than it is for a head of department probably in your university.

Q: When was that the division structure introduced?

A: The division structure dates back at least 10 years but the way it is run at school, it dates back to when I came back in 1997. Basically, I was originally here as a division leader, I went to University of Humberside as a head of department and came back here as a head of school. And so I knew the system. The problem with the division here prior to me coming back is that division leaders were seen as leaders not managers. They had no line manager's responsibility and no budget responsibility so what I did was basically creating a management team for school which is me and the division leaders. Division leaders were given clear management responsibility for the academic staff within the division and the programs and for budget. So they've got very clear line management responsibilities.

Q: Have you always been in academia?

A: I've done, I have been in academia most of my working life but I run my own businesses, consultancy companies so I know how to get things done.

Q: When you say, consultancy, is it a management consultancy?

A: Computer consultancy, educational writing consultancy, development of multimedia consultancy, you name it; I probably have done it at some point.

Q: How long have you been in academia?

A: 20 years

A summary format

Q: How long has 'NetCal' been used at 'SCS'? (not recorded)

A: Use of calendar could have been 5 yrs (could be from 1997 or 1998) and started some changes from 1997 when he came back as a head of school to 'SCS'.

Q: Can you explain to me how and why the decision was made?

A: When he came back to 'SCS' as a head of school, he saw admin staff organizing meetings. He saw how inconvenient it is to arrange a meeting using telephone with a few people and also to see where staff is. The board shows the teaching time but it is only fraction of their time. It was not accurate enough to know where people were. Then he decided to implement a GCS. "I took a decision basically I wanted to implement 'NetCal' because I was using it and my office staff were using it quite quickly then I pushed it out to rest of the school".

Q: Somebody was telling me that 5 or 6 years ago, 'SCS' was trying to make a kind of image as digital 'SCS'. And does it coincide with that?

A: There was a movement some time in 1997 to push 'SCS' as a digital university. It coincides with that idea but from the School's perspective – to get very good way of managing calendars, diaries etc.

Q: How did you implement it? Was there any strategy or plan to do that or was it too trivial application?

A: "It (calendar system) is not a trivial application. Getting people to actually adopt a diary system, calendar system is quite hard. Even now I know it is not 100 % used basically because I, as a head of school and everyone's line manager, if I decided to do something, I can make it happen which isn't the case in many universities but this is not the case in many university and also I was able to sell the benefits to all staff" strategy is a too grand word for it. But I had a plan. Discussed with the division leaders to make sure they were on board. Started to implement it by sending out meeting request, got to the stage where people get used to strange emails and because they are computer literature, they knew what they were supposed to do. Make sure that all meetings and activities should be in diary so that he can make an appointment (interrupted by his secretary)

Q: How did it go down with the division leaders, were they happy?

A: Division leaders were happy. It's nonsense to chase people to make an appointment. Academics are not required to attend meetings. Bought all division leaders Palm Pilot so they can synchronize it with GCS "They've a reason for keeping both of them up to date".

Q: The division leaders' diaries, as far as I know, are open to the administrators here. How did that decision come about?

A: Admin can write in appointment in his. Division leaders are line managers. People knock on doors. They discussed and agreed that it is a good idea to open their calendar so that student can make an appointment with admin.

Q: The privacy has never been an issue anyway?

A: Benefit was that less students knocking on the door. If you want to see me then go to admin and arrange the meeting. "That means you are no longer walking around with these 15 meetings in your head that you are supposed to remember. So they've got reasonable efficiency out of it". If you want privacy, you can always put as a private so people will not see. There is a facility that you can publish your calendar on website but we haven't encouraged people to do that even though some might do that. "There is a little bit of control, a little bit, we've got enough control about it". Engineering joined in last August and he recognized the time it takes for them to use 'NetCal'.

Q: You said that the officers could write in your calendar. You must be inundated with the meeting requests, how do they know which one to put in and which one not to?

A: Admin staff accepts meeting if his calendar is clear and if he is not then they will ask. They manage his calendar by printing it out weekly basis then go through if there is something that he does not want.

Q: So, they would accept a meeting request and you will go through which one you might like want to...

A: Quite often he accepts a meeting request

Q: Majority was happy with 'NetCal' but there is a view, it's a minority but they don't want to be managed in this way, as an academic.

A: "You've got no option. This is a managed institution"

Q: Do you think this as a management tool?

A: "I think it is an essential part of an efficient administration system. I don't see it as a part of management, I don't sit there pouring over people's calendars to find out what they are doing and when they are doing it. I just want to know that if I want to make a meeting I can send out one message and people have the option to say no".

Q: It requires people to change their calendaring habits because some people might have used a paper calendar for the last 40, 30 years. You are asking them to change it. How does that work?

A: He tried to use electronic diary for a few times but had gone back to the paper because they were not compatible. "I then had two incompatible diaries. One was in machine and a paper one which I carried around with me". Need a device like Palm Pilot. "Make whole thing more transparent and easier to use"

His regrets - (1) "We've never gone any further than a diary system" use a voting system. Used to have a coffee machine but some asked for water cooler so used a voting system. (2) "Tried to use task management system once or twice but that was harder". Within 'NetCal' it is not commonly strong feature. Needs a lot of effort to allocate someone a task. (3) the other problem they have - End up issuing appointment request things he describes as "standard academic calendar issues" again it is the weakness of the current version of the 'NetCal' they are using. There are host of meetings such as course board, subject board, division meetings are sent out individually as a meeting request and staff have to answer separately. Therefore he is looking for to create a central calendar which replicated into everybody else's calendar. It did not work. 2002 has a central calendar feature. Cut down minor effort

that member of staff has to do. (4) Not 100% of staff making use of 'NetCal'. "It is a very simple rule, if they don't turn up because they don't use calendar. That's their problem, it's not mine".

Q: How important do you think it is to have this sort of system in the academic environment?

A: Very important. Have a small number of admin so can't waste time to get 10 people. "To get to keep the freedom that they do have, there is requirement to take responsibility for keeping that thing up to date". "we can survive if they just keep the calendar they using it up to date" "There is nothing worse than getting a phone call...it's so unprofessional, you pick up a phone and say, it there so and so in and you go don't know, when will he be in, don't know um..Can I make an appointment to see him? Hm...ye..give your number and I will..what will be your impression you are calling BP's head office and you get that".

Q: It seems to me that you don't manage your calendar. Admin staff manage your calendar. Are you confident?

A: Yes

Q: How long have you been working with them?

A: August last year there were changes as his admin officer moved to the registry. "I have the ultimate responsibility for making sure calendar works".

Q: Do you also put in your personal appointments as well?

A: Personal appointments are recorded in the office one which the admin staffs are managing – e.g. dental appointment, wife's birthday, and wedding anniversary.

Q: You don't mind sharing all that?

A: Don't mind people seeing it but if not, he would just make it as private.

Q: You have identified a scheduling problem within this school. Do you think that has been addressed, solved?

A: Since then scheduling problem has been reduced. When he came back as a head of school, there were only very roughly 35 academic staff and about 4 admin staff and 2 technical supports, it's now, including researcher and research assistants, 115 staff. He can make an appointment and know that everybody is going to get it and end up in their calendars.

Q: Why do you think this school adopted and use 'NetCal' more than any other school at 'SCS'.

A: "Because I wanted it to happen"

Q: As far as I understand, you sent out email and nobody seems to really remember, apart from receiving one email, was that enough to make...

A: "This is a managed institution." By having division structure helps. It is easier for me to get something to happen than is for a head school in your university.

Q: When was that the division structure introduced?

A: At least for the last 10 years but the way it runs in this school, it dates back when I came back 1997. He was a division leader before then. He went to other university as

a head of school. Problem with the division here prior to him coming back was that division leaders were seen as leaders not managers. So gave line manager responsibility. They had no budget responsibility so what he did was that he created a management team for school and division leaders were given clear management responsibilities for programs and budget.

Q: Have you always been in academia?

A: Have been in industry running his own business. "Knows how things get done".

Q: When you said, consultancy, is it a management consultancy?

A: Computer consultancy, educational writing consultancy, development of multimedia consultancy etc.

Q: How long have you been in academia?

A: 20 years.

APPENDIX B

Pilot study questionnaire and interview questions

B. 1 Pilot study-stage one questionnaire

I would like to thank you for answering this questionnaire. This is to understand the effective use and management of time in relation to the use of Groupware Calendar System (GCS) in organisations. This questionnaire is part of on-going research on the use of GCS in the U.K. The result of this questionnaire will be used strictly for this purpose only.

Calendars in Paper - any paper calendar e.g. filofaxes, diaries.

Calendars in Electronic - any electronic calendar e.g. computer based calendar but for the single user only, electronic personal organisers, mobile phones, PDAs.

Groupware Calendar Systems (GCS) - any calendar that allows a group of people to share e.g. Microsoft's Outlook, Lotus Notes and Yahoo.

Part A. General Calendar Usage

1. What type of calendar do you use at work? Please number them in the order of frequency. (e.g. using only one type then, put number 1 only)

- Calendar in paper
- Calendar in electronic
- Groupware Calendar System (GCS)
- None - Go to ***Part C***
- Other

Please specify _____

* If you do not use GCS, please go to ***Part C***.

Part B. About Groupware Calendar System (GCS)

2. How long have you been using GCS?

- Less than 1 month
- 1 month - 6 months
- 6 months - 1 year
- Over 1 year

3. What kind of training have you had for GCS? Please tick as many answers that are appropriate.

- A thorough training on all the functions of GCS from a vendor
- Basic training from a vendor
- A thorough training on all the functions of GCS from IT department or your department
- A basic training from IT department or your department
- From colleagues
- Learned by yourself

4. How often do you use GCS?

- Several times a day
- Once a day
- Once or twice a week
- Once a month
- Rarely

5. What is your privacy setting for others to see your calendar?

- Open
- Free/Busy

6. What is/are the main reason(s) for using GCS? Please tick as many answers that are appropriate.

- To arrange a meeting
- To locate someone (e.g. in meeting, on business trip)
- To see what others are working on
- To see the progress of other's work
- Other

Please specify _____

7. How accurate are the details of other's calendars?

- Very accurate
- Accurate
- Moderate
- Less accurate
- Not accurate at all

8. What was the primary reason you started using GCS?

- A company policy
- A department policy
- Colleague(s) were using it
- My intention to use it
- Other

Please specify _____

9. Do you use GCS when you are outside of the office?

- Yes - please specify (e.g. computer at home, PDA)
 No

10. Do you think GCS helps improve work efficiency?

(Individual level)

Completely Agree 1 2 3 4 5 Completely disagree

(Departmental level)

Completely Agree 1 2 3 4 5 Completely disagree

(Organizational level)

Completely Agree 1 2 3 4 5 Completely disagree

11. What are the advantages and disadvantages of GCS?

Advantages _____

Disadvantages _____

12. Do you put personal schedules in GCS?

- Yes - Go to *No. 14*
 No - Go to *No. 13*
 Depends on the details
 Please specify _____

Part C Future GCS Use

13. Would you put personal schedules in GCS?

- Yes
 No

Part D Demographic Information

14. Gender

- Female
 Male

15. Age

- Over 20
 20 - 30
 31 - 40
 41 - 50
 Over 51

16. What are your job title and department?

Job title _____

Department _____

17. How long have you been working for the company?

18. How would you rate your IT skills?

- Expert
 Advanced
 Intermediate
 Novice

If you are willing to be contacted at a future date regarding this questionnaire, please provide your name and e-mail address below.

Name _____

E-Mail Address _____

I thank you once again for your time.

B. 2 Pilot study-stage one follow-up interview questions

Questions A (About the Interviewee)

1. How long have you been working?
2. Can you describe your work?

Questions B (General Calendar Use)

3. Do you use a calendar?
4. How many calendars do you use other than GCS?
5. What kind of calendar do you use?
6. Any particular reason?
7. Can you describe the calendar usage?
8. How important is it to you?

Question C (Background of GCS Use)

9. When did you start using it?
10. How did you start using it?
11. Was there any training?
12. Was there any peer pressure or pressure from above?
13. When did you find it useful?
14. When did you find it not so useful and rather hinders your working progress?
15. Why do you use GCS? e.g. meeting scheduling, etc.
16. A typical scenario of the way you use GCS?
17. Not so typical scenario?
18. How important is it for your work?

Question D (Viewing Others' Calendars)

19. What is your viewing setting, e.g. open or free/busy?

(Version 1-open view setting)

20. Do you look at other peoples' calendars?
21. Any reasons?
22. Whose calendar do you look at mainly?
23. How often?
24. Does people can read your calendar have any effect on what you write in?
25. Are you able to change others' calendars?
26. If so, how often and why?
27. If not, why?

(Version 2-free/busy view setting)

28. Are there any difficulties in having a 'free/busy' setting when you schedule a meeting?
29. How useful is having a 'free/busy' setting?
30. Do you feel the need of opening up calendars so that everyone can see the details of each other's calendar?

Question E (User Evaluation)

31. Any difficulties in using GCS in general?
32. Would you like to suggest any improvements in GCS that you are currently using?
33. How useful is it for mobile work or for working from home?
34. Is there anything else that you would like to add?

Questions F (Personal Details)

35. Your full name
36. Age
37. Gender
38. IT skill

B. 3 Pilot study-stage two interview questions for GCS users

Questions A (About the Company and Interviewee)

1. About the company? (company description)
2. How many employees are there in total?
3. Which section do you work in?
4. How many people are there in your section?
5. How long have you been working?
6. Can you describe your work?

Questions B (General Calendar Use)

7. Do you use a calendar?
8. How many calendars do you use other than GCS?
9. What kind of calendar do you use?
10. Any particular reason?
11. Can you describe the calendar use?
12. How many personal appointments do you have per week?
13. How many business appointments do you have per week?
14. How important is it to you?

Question C (Background of GCS)

15. Which product do you use?
16. How many people are using GCS in your work place?
17. And how many are using it actively?
18. How many people do you share your calendar with?
19. A typical scenario of the way it is being used there?
20. Not so typical scenario?

Question D (Background of GCS Use)

21. When did you start using it?
22. How did you start using it?
23. Was there any training?
24. Was there any peer pressure or pressure from above?
25. When did you find it useful?
26. When did you find it not so useful and rather hinders your working progress?
27. Why do you use GCS? e.g. meeting scheduling, etc.
28. How important is it for your work?

Question E (User's GCS Usage Pattern)

29. How often do you use GCS per day?
30. How many times do you update it e.g. add or delete events?
31. How many times do you view it?
32. What is the length of look ahead e.g. a week or a month?
33. How many appointments do you have per week?
34. What determines which ones get noted in your calendar?
35. How many appointments in your calendar get rescheduled?
36. What do you do if an appointment occurs when you have no access to your computer?
37. Do you use your GCS for anything other than writing down the appointments?

Question F (Viewing Others' Calendars)

38. What is your viewing setting, e.g. open, free/busy?

(Version 1-open view setting)

39. Do you look at other peoples' calendars?
40. Any reasons?
41. Whose calendar do you look at mainly?
42. How often?
43. Does that people can read your calendar have any effect on what you write in?

44. Are you able to change others' calendar?
45. If so, how often and why?
46. If not, why?

(Version 2-free/busy view setting)

47. Are there any difficulties in having a 'free/busy' setting when you schedule a meeting?
48. How useful is having a 'free/busy' setting?
49. Do you feel the need of opening up calendars so that everyone can see each other's?

Question G (Scheduling meetings using GCS)

50. Have you used GCS to arrange a meeting?
51. If so, how often?
52. How effective was it?
53. Is it a normal practice there?
54. How was the meeting organised before?
55. Any problem or difficulty you have experienced using GCS?
56. Can you recall any 'critical incidents', in which GCS has failed?
57. What happened when rescheduling occurred at the last minute?

Question H (Mobile Use)

58. Do you work from home?
59. If so, how often?
60. How useful/not useful is GCS when you work from home?
61. How often do you work outside of the office?
62. Do you use any mobile technologies such as PDA or mobile phone to view your calendar?
63. If so, how useful/not useful?

Question I (User Evaluation)

- 64. Any difficulties in using GCS in general?
- 65. Would you like to suggest any improvements in GCS that you are currently using?
- 66. What kinds of effect do you think GCS has on the general working practice?
- 67. Is there anything else that you would like to add?

Questions J (Personal Details)

- 68. Your full name
- 69. Age
- 70. Gender
- 71. IT skill

B. 4 Pilot study-stage two additional interview questions for managers and secretaries

Questions A (Manager and Secretary Calendar Use)

1. How often do you view the calendar?
2. What are the reasons for using the current calendar artefact?
3. How important is the calendar for your work?

Questions B (Manager)

4. How many meetings do you have per week?
5. What is the typical scenario of using the calendar with the secretary?
6. Does your secretary have an access to your personal calendar information?
7. If no, why?
8. If yes, why?
9. How often do you work outside of the office?
10. How are the meeting requests handled by your secretary while you are outside?
11. How do you handle the meeting request while you are out of the office?
12. If you have a calendar other than the one you share with your secretary, how do you manage them?
13. Any problem of synchronization of calendar?
14. Any issues on sharing calendar with the secretary?

Question C (Secretary)

15. How does an appointment arise normally?
16. What is the typical scenario of sharing a calendar with the manager?
17. How many appointments get rescheduled?
18. What are the main reasons?
19. Was there any incident that your calendar management has failed on you?
20. What are the advantages of using the current artefact?

21. Disadvantages?

22. Have you used any other calendar artefact?

B.5 Pilot study-stage two interview questions for non GCS users

Questions A (About the Company and Interviewee)

1. About the company? (company description)
2. How many employees are there in total?
3. Which section do you work in?
4. How many people are there in your section?
5. How long have you been working?
6. Can you describe your work?
7. Do you work outside of the office?

Question B (General Calendar Use)

8. Do you use a calendar?
9. How many calendars do you use?
10. What kind of calendar(s) do you use?
11. Why?
12. How long have you been using the calendar (s)?
13. Do you have a separate calendar for personal use?
14. If so, any reason?
15. How often do you open your calendar to view?
16. How often do you open your calendar to add or delete?
17. How important is it for you to have your calendar with you?
18. What are the reasons you use a calendar?

Question C (Meeting Arrangement)

19. How many personal appointments do you have per week?
20. How many business appointments do you have per week?
21. How do you arrange meetings?
22. Any difficulty?

Question D (Future GCS Use)

- 23. Do you think GCS would be useful for you?
- 24. If yes, why?
- 25. If no, why?
- 26. Anything you would like to add?

Questions E (Personal Details)

- 27. Your full name
- 28. Age
- 29. Gender
- 30. IT skill

APPENDIX C

Case study data analysis

C. 1 Interview questions: case study

First

1. Name of the organization
2. Total number of people in the organization
3. No of department
4. Organizational background information e.g. nature of business
5. Any other GCS products used in the organization

Second

6. How many people are working there (total no.)?
7. What GCS software do you use?
8. How many people are using GCS?
9. How long has it been used?
10. Why using GCS?
11. Why 'NetCal' not others?
12. What is the default of viewing?

Third

13. What is your job title and role?
14. How long have you been working for this organization?
15. How many meetings (appointments) do you have per week?
16. How many meetings do you attend per week?
17. How many days do you work from home per week?
18. How often are you on mobile?

19. How do you arrange meetings?
20. How are meetings get arranged for you?

~~21~~

~~21~~

21. How many calendars do you have?
22. What are they? (Paper? Electronic?)
23. How long have you been using the calendar (s)?
24. Do you have a separate calendar for personal use?
25. If so, any reason?
26. How important is a calendar for you?
27. And to your work?

~~28~~

28. How long have you been using 'NetCal'?
29. What was the reason you started using 'NetCal'?
30. Why do you use it?
31. Was there any pressure to use it?
32. When do you use it? (For what job?)
33. Any typical scenario of the way you use 'NetCal'?
34. How often per week for the purpose you mentioned?
35. What is the most important feature or function that it has?
36. How often?
37. Do you give tasks to others using 'NetCal'?
38. Do you view your colleague's calendar?
39. For what reason?
40. How often do you view other's calendars?
41. What is your calendar viewing setting?
42. Do you mind if your colleagues view your calendar?
43. Any issues?
44. Do you have your personal appointments on the calendar?
45. Any incident that 'NetCal' has failed? (example)

46. Any incident you can remember with using 'NetCal'?
47. What do you think about 'NetCal'?
48. Any advantages of using 'NetCal'? (example)
49. Any disadvantages of using 'NetCal'? (example)
50. Have you used any other GCS?
51. How important is it for you?
52. For your work?



53. How do you arrange meetings using 'NetCal'?
54. How often?
55. What do you think of it compare to other ways of arranging meetings such as using phone calls or emails?
56. Is there anything else that you would like to add?

C. 2 Questionnaire

Please tick the appropriate box

1. Was there pressure from others to start using 'NetCal'?

Very much Some Neutral Not much Not at all

2. Is there pressure from others to keep your schedule up to date?

Very much Some Neutral Not much Not at all

3. How important is 'NetCal' for your work?

Very important Important Neutral Unimportant Not important at all

4. How useful is 'NetCal' for?

(1 = Very useful, 2 = Useful, 3 = Neutral, 4 = Not very useful, 5 = Not at all useful, 6 = not applicable)

Managing your personal calendar

1 2 3 4 5 6

Arranging meetings

1 2 3 4 5 6

Finding out where a person is (locating someone)

1 2 3 4 5 6

Delegating tasks (project management)

1 2 3 4 5 6

Finding out the availability for an informal chat

1 2 3 4 5 6

Accessing your/others' calendar(s) from home

1 2 3 4 5 6

Accessing your/others' calendar(s) while on the move

1 2 3 4 5 6

Other usage, please state, _____

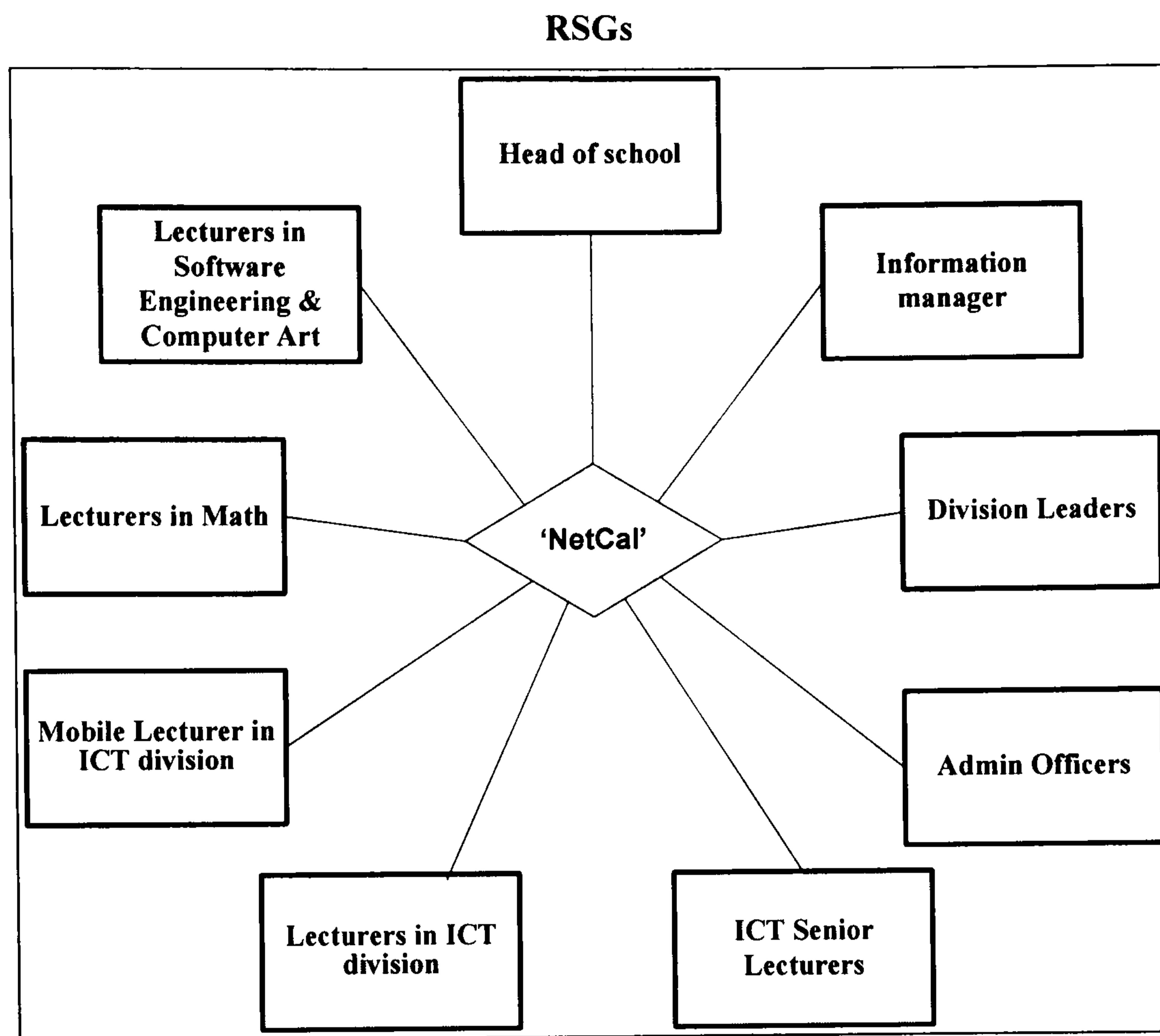
1 2 3 4 5 6

5. Do you think that 'NetCal' helps improve work efficiency?

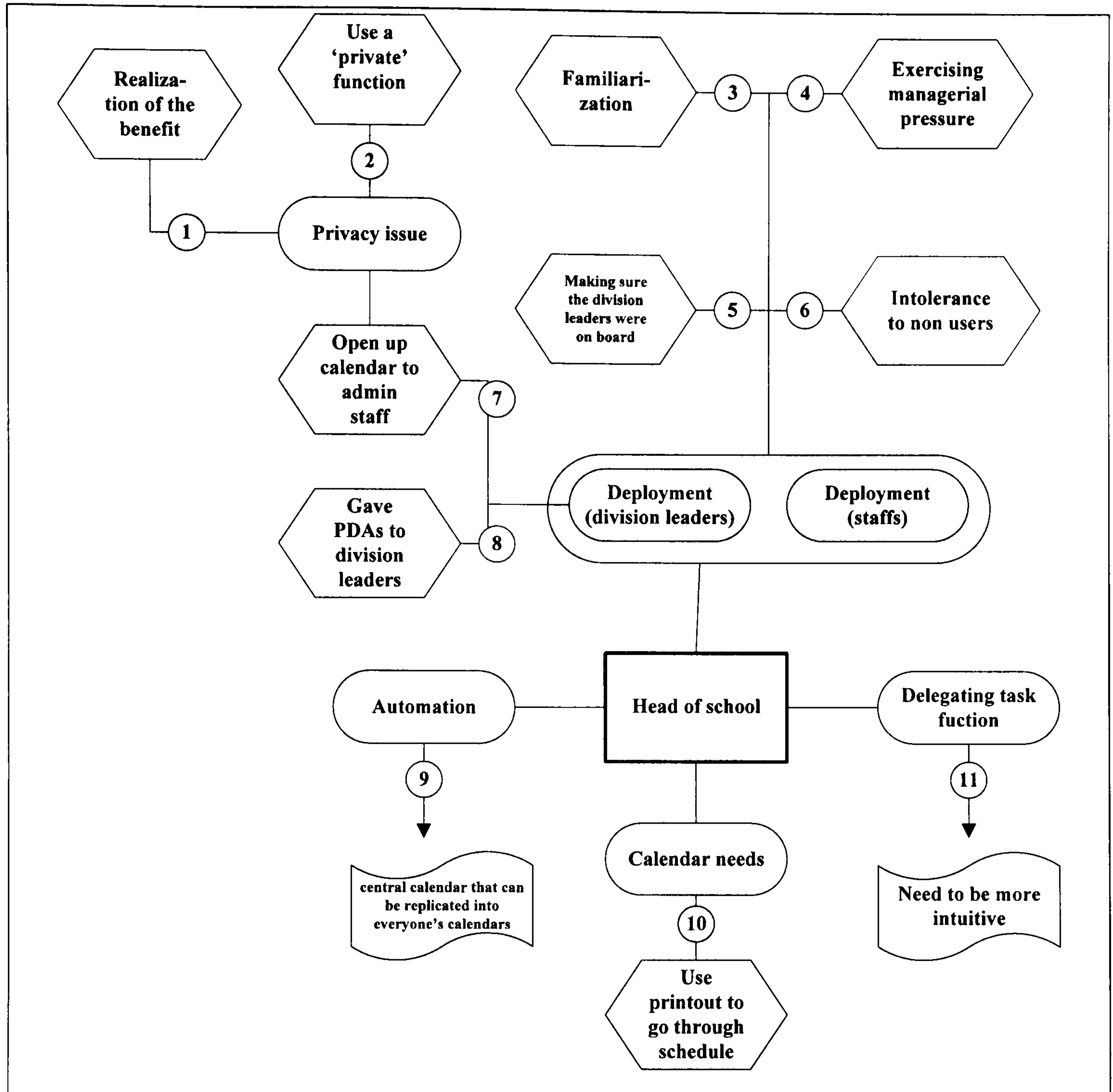
Completely agree Agree Neutral Disagree Completely disagree

Thank you very much

C. 3 'SCS' M-SCOT framework analysis



Head of School



1

22.7 The privacy has never been an issue in anyway?

Benefit was that less students knocking on the door. If you want to see me then go to admin and arrange. "...that means, you no longer walking around with these 15 meetings in your head that you suppose to remember. So they've got reasonable efficiency out of it..."

2

22.7 The privacy has never been an issue in anyway?

If you want privacy, you can always put as a private so people will not see. There is a facility that you can publish your calendar on website but we haven't encouraged people to do that even though some might do that. "...there is a little bit of control, a little bit, we've got enough control about it..."

3

22.4 How did you implement it? Were there any strategy or plan to do that or was it too trivial application?

"Started to implement it by sending out meeting request, got to the stage where people get used to strange emails and because they are computer literature, they knew what they are supposed to do". Make then mind up that all meetings and activities should be in diary so that the head of school can make an appointment.

4

22.4 How did you implement it? Were there any strategy or plan to do that or was it too trivial application?

"It is not a trivial application. Getting people actually adopt a diary system, calendar system is quite hard. Even now I know it is not 100 % used basically because I, as a head of school and everyone's line manager, if I decided to do something, I can make it happen which isn't the case in many universities and this is not the case in many university board".

22.13. How important do you think it is to have this sort of system in an academic environment?

Very important. small admin so can't waste time to get 10 people. "...to get to keep the freedom that they do have, there is requirement to take responsibility for keeping that thing up to date..."

22.20 As far as I understand, you sent out email and nobody seems to really remember, apart from receiving one email, was that enough to make?

"...this is a managed institution. Having division structure helps..."

5

22.4 How did you implement it? Were there any strategy or plan to do that or was it too trivial application?

"...and also I was able to sell the benefits to all staff. Strategy is a too grand word for it. But had a plan. Discussed with the division leaders to make sure they were on..."

6

22.12 It requires people to change their calendaring habits because some people might have used a paper calendar for the last 40,30 years. You are asking them to change it. How does that work?

"It is a very simple rule, if they don't turn up because they don't use calendar. That's their problem, it's not mine..."

7

22.6 The division leaders' diaries, as far as I know, are open to the administrators here. How did that decision come about?

Admin can write in appointment in mine. Division leaders are line managers. People knock on doors which can be disruptive. We discussed and agreed that it was a good idea to open their calendars to admin staff so that students can make an appointment through the admin staff.

8

22.5 How did it go down with the division leaders, were they happy?

Division leaders were happy. It's nonsense to chase people to make an appointment. Bought all division leaders Palm Pilot so they can synchronize it. "...they've a reason for keeping both of them up to date".

9

22.12 It requires people to change their calendaring habits because some people might have used a paper calendar for the last 40,30 years. You are asking them to change it. How does that work?

The other problem we have - End up issuing appointment request, "...standard academic calendar issues...". It is the weakness of the current version of GCS we are using. There are host of meetings such as course board, subject board, division meetings are sent out individually as a meeting request and staff have to answer separately. Therefore I am looking into a central calendar which can replicate into everybody else's calendar.

10

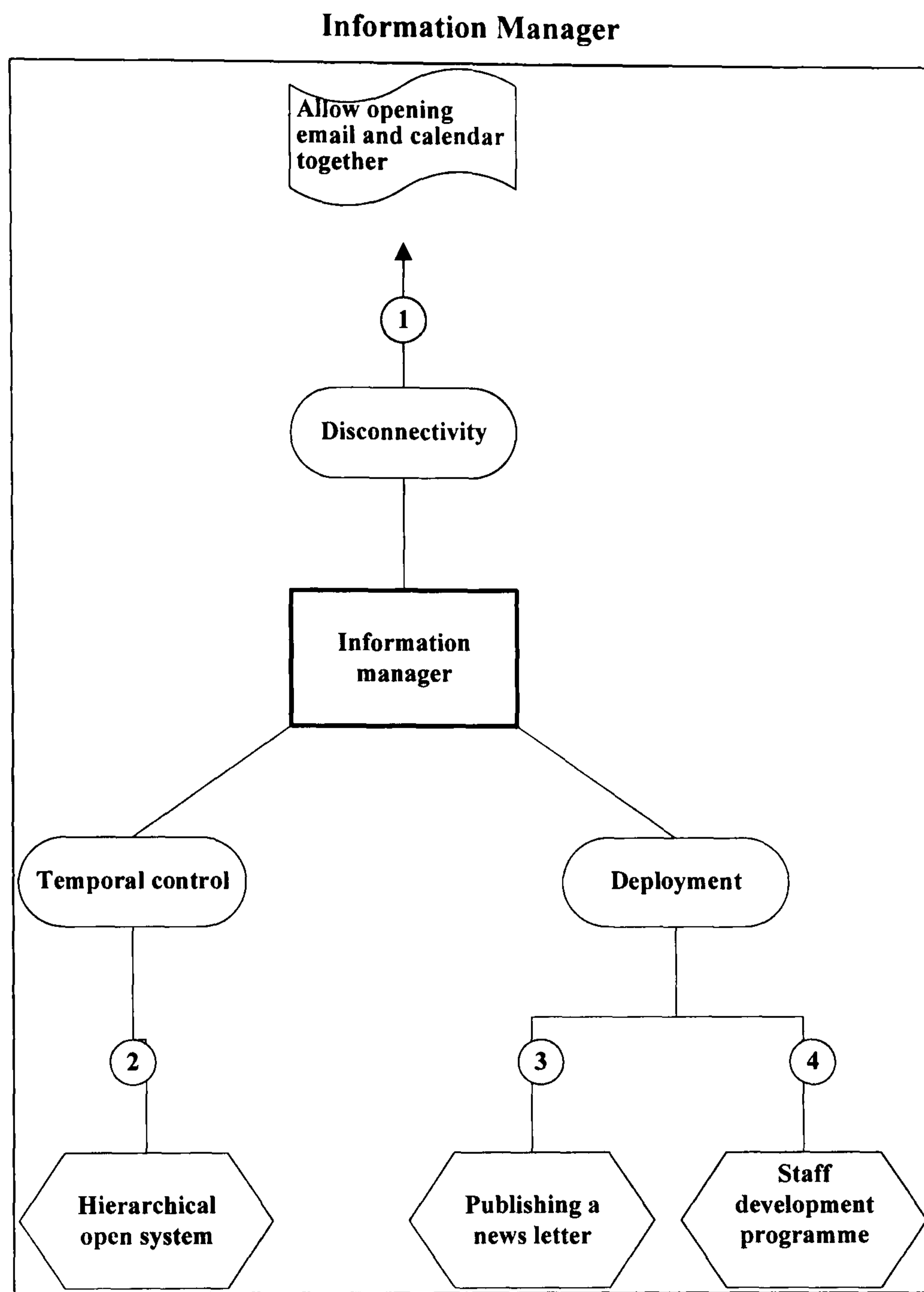
22.8 You said that the officers could write in your calendar. You must be inundated with the meeting requests, how do they know which one to put in and which one not to?

Admin staff accept meeting if my calendar is clear and if not then they will ask. They manage my calendar. I print it out weekly basis and then go through if there is something that I do not want.

11

22.12 It requires people to change their calendaring habits because some people might have used a paper calendar for the last 40,30 years. You are asking them to change it. How does that work?

"...tried to use task management system once or twice but that was harder..." Within GCS, it is not commonly strong feature. Needs a lot of effort to allocate someone a task.



1

21.28 Are there any disadvantages?

"The way the package is laid out, 'NetCal' package is laid out, could have been more intuitive for staff..." You need to come out instead of not being able to open up inbox and calendar together.

2

21.13 In your division, do you have an open system?

Information services has an open system so if the meeting is not so important then contact the person and say "...could you move that because you are the only one person can't make that..." "...that extra ability to be able to determine exactly what meeting is allows me to perhaps move meeting around"

21.14 How many people are there in your department?

About 100 people in information services.

21.15 How often do you arrange meetings?

Arrange meeting daily basis and "...services department pretty much evolve around meetings. Therefore it is vital to coordinated easily..."

21.16 How many people do you have an open access to?

"Depends but it is kind of hierarchical. Me being a manager, pretty much top of the tree, you can see anybody's calendar."

21.17 Are they told to open up their calendar to you?

By default, you get free/busy setting. "...because services is hierarchical, it is expected that your manager will be able to find out where you are at any given time" and you can mark private so not all information is going out.

21.18 Do they put their personal events and appointment?

They expect people to put down if they are going out of the office. They might just put 'appointment' and not telling what appointment it is but that additional information is needed for it to work efficiently so "...we encourage people to put everything in there..."

3

21.24 Apart from the staff development, is there any other measure you take to encourage more people to use it?

Used to run news letter explaining things that people should be aware of 'NetCal' and so on. That does not come out very often now. Should do more on explaining benefits and reflection that look, you've got this application, you can do this and that.

4

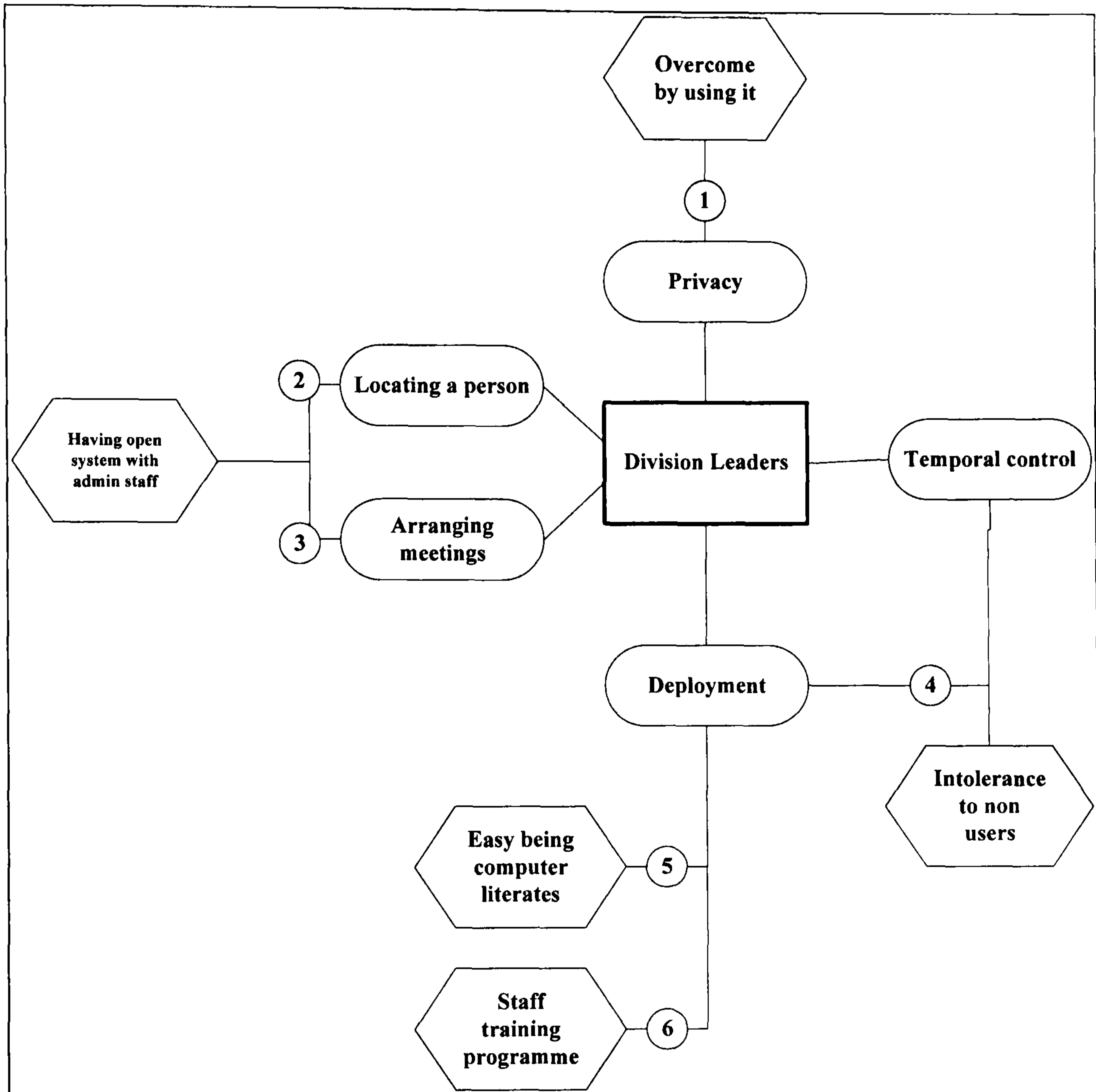
21.9 You mentioned that you encourage people to use it. How do you do that?

Runs staff development programme, normally once a year but runs more than once a year but rather more frequent now.

21.11 Is it expected for people to attend?

"If you are moving to something like this, a lot of people don't like computers telling them how to run the life and essentially, that's what 'NetCal' does, screen pops up and tells you, you have to in a certain place at certain time. People don't like that. It is a cultural change to make people to use computers to manage their time and life effectively and a lot of people who's been doing things in certain ways over a number of years, quite resistance to that change..." Encourage more people to come along to the staff development course because "...more use they make of system, more productive themselves are and university as a whole..."

Division Leaders



1

9.4 Do you know why?

"I think perhaps school of computing is more used to computer and less frightened about it whereas some other schools, they would be more concerned about strange things whether or not their activities are being monitored. I don't think that they fully understand how the tool works and I think that is a part of a problem".

9.6 You mentioned that in other department they were worried about being monitored and so on, was there privacy concern within this school?

There was, some of mathematicians to begin with but once they realised that what they are doing is not shown, that overcome very quickly.

2

9.19. You mean the three admin staffs in the office?

Yes. "...I also like that from a point of view that I have two children and I want to make sure that if the school ever phones the University, they can find me very quickly. And the only way for that to happen is for the school office to know where I am. So I am happy that they know where I am all the time. I have no difficulty with that".

3

9.15. How do you see the changes after using GCS?

One of the substantial changes for me personally, students will go to the student office to make an appointment with me and they book. School office has an open access. "...I gave a full access to see where I am... I want them to know that if I am abroad, it's going to take some time for me to get back. There is no point of booking an appointment too close to that. That has made a big difference to me. I received far less email from students, 'can I see you on Tuesday at 10 o'clock and emailing back 'no, I am sorry, I am busy but how about 11 o'clock and email back and say 'no, I've got class' all that junk administration has gone because the school office is doing the booking for me".

4

9.7 Do you enforce using it?

"Within the division, the basic policy is if your calendar says you are free then you are free therefore, if I book an appointment with you then you come to my appointment. It's that simple as that. If you didn't want to be free for that time, it should have been in your calendar".

9.9 Some people might say that academics environment is different from the business environment and don't want to be managed in this way. How do you think of that?

"We are a business, we are a business and I am a manager. It is my responsibility to know where my staff are and it's their responsibilities to ensure that I know where they are. I don't think that they feel restricted by this because if they tell me they want to work from home, then that's fine, you work from home, you put it in your calendar that you are working from home. I don't have any difficulty with that what so ever. If you want to spend two hours going for a stroll in the afternoon to get some idea, I have no problem with that either, just put it in your calendar. It's actually quite simple. We are not restricting their freedom by asking them to block off their time in their calendars but in many ways what we are doing is, we are increasing their freedom because it means that they can then look in advance 'okay, I am going to devote this time to me and for me to think about things'. Blocking off the calendar, something won't happen at the same time".

5

9.4 Do you know why?

"I think perhaps school of computing is more used to computer and less frightened about it whereas some other schools they would be more concerned about strange things whether or not their activities are being monitored..."

9.5 Were there any training, what this software does and what benefits that they can get out?

There was a university wide training but don't know how many people from this school attended. People in this school are used to just try out different software. We are less concerned about the training than business school. There is a training sessions every year for staff.

6

9.5 Were there any training, what this software does and what benefits that they can get out?

There was a university wide training but don't know how many people from this school attended.... There is a training sessions every year for staff.

Admin Officers



1

14.8 Does your 'Cats' calendar synchronise with your personal calendar?

I have to have two separate entries. "...it would be very handy if I could do something in my calendar and automatically update the other...it would save a lot of time..."

2

14.6 Do you share calendar among yourselves in this office?

Have 'Cats'. Office calendar (5 people have an access to it and use it for holidays and their schedule) - because need to communicate with people in the other office.

18.10 People put some of their personal events in 'Cats', has it been any problem?

Because the office is supposed to be open all day, we have to know the lunch breaks so that we can arrange the cover. Try to open the office all day. We don't need to give an explanation. This is not university practice but this is useful. Because it was difficult to know who is available during the lunch hour and the two office are in distance.

19.17 Do you put your personal things in 'Cats'?

Put personal things for lunch time but nothing else or course or something that to do with work 'Cats' "...I think, I go swimming twice a week and RA goes to fit class once a week and it was, I was trying to go on days when she wasn't going so...and if you were meeting a friend and have a longer lunch, you've got to see what rest of the people are doing..."

3

1.17 Did they have an open system when you moved to there?

No, I suggested that it would be an idea because people phone and say 'can I speak to somebody' then can tell them exactly when the person is going to be back. You can be busy all day so useful to tell them when they can get hold of the person.

4

19.11 Anything don't like about 'NetCal'?

"There was conflicting appointments but it wasn't telling us that. For start, it was a problem"

5

18.4 Is there any problem sharing the head of school's calendar?

Sometimes the head of school does not let us know that he is on holiday.

6

1.33 How do you arrange meetings with people who don't use 'NetCal'?

"... missing a meeting because you didn't know it was in your calendar was not considered to be an excuse because we all are supposed to be using it"

1.37 Can you trust other people's calendar? Is it accurate?

"...it should be...Most of the time now ye, again occasionally with academics, they don't put their teachings in so you might find that 'oh, I can't do that because I am teaching' and my general response to that is 'it was not in your calendar' so I am not very sympathetic. "

7

19.9 Where there any training?

There was a two hour training. "...it was okay but it's not until you actually using it, you get used to and you come across queries and things like that"

8

1.33 How do you arrange meetings with people who don't use 'NetCal'?

"...I sometimes had to show people how to use it properly..."

9

1.33 How do you arrange meetings with people who don't use 'NetCal'?

"...I think it is to do with keep plugging away at it. Then eventually, people will get a notice 'oh, that's how it's happening now..."

10

18.5 How do you see the double booking?

Do not accept if the head of school is out of the office but if he is in then ask him to choose. When he is not in the office, I decline the conflicting appointment.

11

1.39 How was it for you when the system was down?

"That was a nightmare...". I did not know what it is when, even though I knew that I had meetings. Then I phoned around people that I thought I had a meeting with and asked when the meeting was. "...Hiccups happen"

12

14.3 Can you tell me why?

When students or other people want to see one of the division leaders, I can tell them where CL is. Other admin staff also have access to CL's calendar.

14.4 Does she has personal events in her calendar?

"Yes, CL puts everything, dental appointment, hospital appointment. If she feels it is too too personal, she will just say busy but she is one of good ones".

14.5 Do you think it is important to have an open system?

"Yes, she gave me an access to look at her calendar so she is comfortable with it...it's good for us"

18.3 Do have access to other staff?

All the division leaders. Have write in access for some division leaders - sometimes write the meeting e.g. putting it in CL's calendar - don't even put my name in 'write access'. Does not do that very often but maybe a dozen times in semester.

13

1.133 How do you arrange meetings with people who don't use 'NetCal'?

"People who I am pretty sure not using it or not responding to, I will possibly prior to meeting, give him a phone call"

14

1.6 How do you use calendar in the registry office?

Use 'NetCal' to check people's availability and arrange meetings.

15

1.11 How many calendars do you have?

One personal (wall calendar to keep a track of what I, my husband and children are doing) and one work calendar.

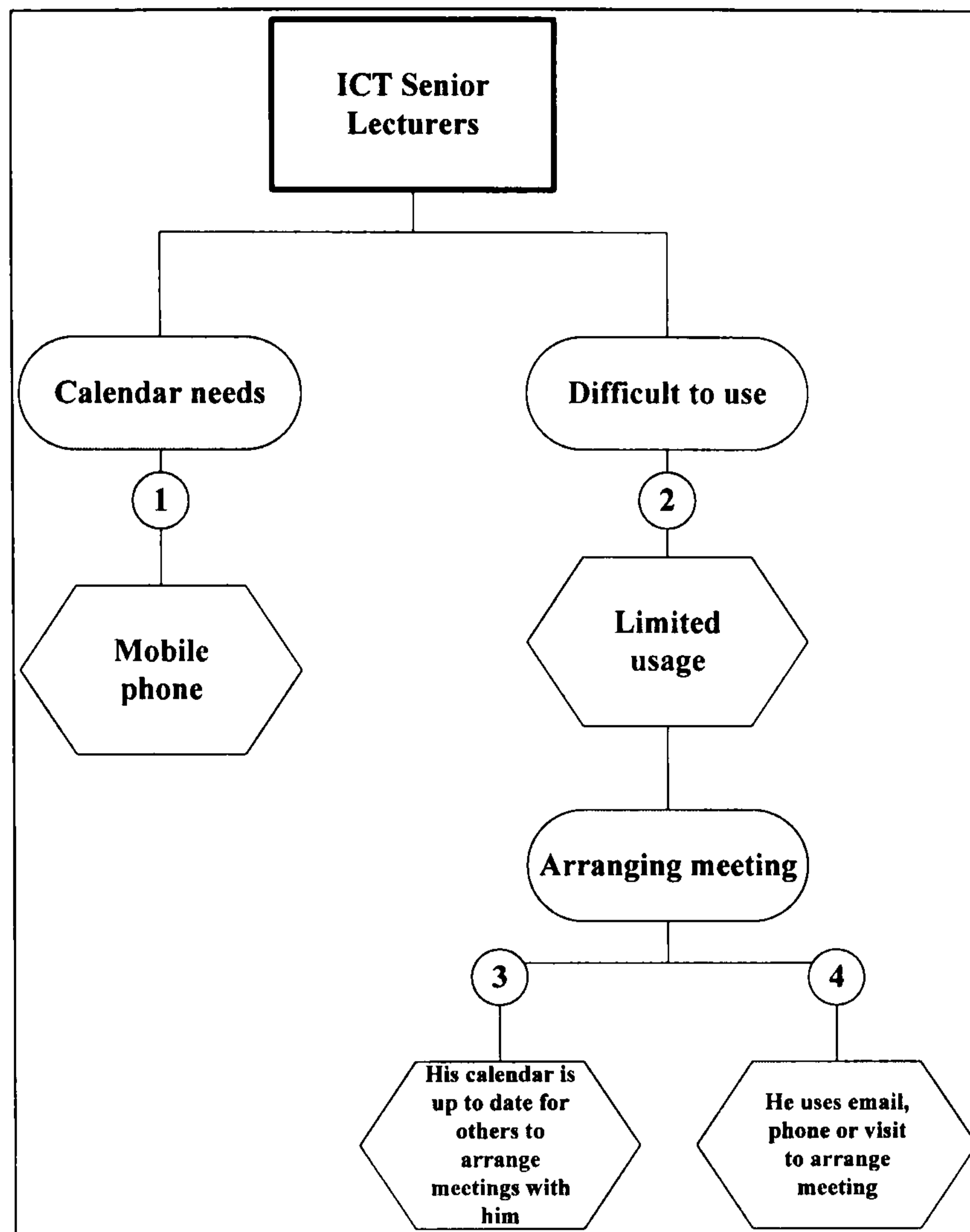
1.12 How do you use them?

If personal appointment happens during workings hours then put it in a work calendar because it affects my availability at work.

14.9 Do you have any other calendar?

(pointing to the wall calendar at her desk) "Quickly to remind myself" which has my holidays in. Have another calendar which my daughter made- things happening outside of the work. 'Cats' calendar- everything to do with University work and girls in the office. Have an academic diary which I take to the meetings. Personal 'NetCal'- anything to do with me. Having all these calendar and making sure they are up to dated - "...It's really time consuming"

ICT Senior Lecturers



1

12.2 Do you have any other calendar?

Use only 'NetCal' and no other calendar. Keeps some on my mobile phone.

12.3 How do you synchronise?

If it can, never try to synchronize them. Don't know how.

12.4 What goes on to 'NetCal' and what goes on to mobile?

Most of appointments are in 'NetCal' and occasionally put on mobile to remind myself.

2

12.5 What do you think of 'NetCal'?

If somebody send me an appointment, I get confused. I was never sure the difference between task and meeting request. If I can, I will accept it and if I cannot I will say I can't. Use a lot, keep everything in it, use it everyday but use is very basic. Use a reminder and put reoccurrence events but that's all.

12.8 How do you arrange meeting?

I don't know how to do it. Somebody has to show me. PT showed me once to set up a meeting. I found 'NetCal' difficult to use. 'NetCal' is not intuitive. Found it difficult than what I used before. Cannot understand the terminology. Can not understand the differences between task and a meeting request. It refers to task but for me that is not task and it's an appointment. "...I've found difficult to get used to 'NetCal'". Don't understand a personal address book and a contact list at all. "...I just don't have time for that. It's not clear and a dummy like me, I never use it..." People use calendar and I will attend meetings that people sent me. I just don't hold many meetings of my own. Not formal ones. Informal ones yes.

3

12.22 How accurate is your calendar?

If they need to see it then they can so I up to date.

4

12.10 Would you check their availability?

I will go down and ask them when they are free...'Are you free on certain date?'

1

20.7 Do you use any calendar or diary?

'NetCal' is the only one and use it at home which my wife puts things in. Try to put things to both work and home 'NetCal' but not satisfactory. So put my personal things to my work 'NetCal'.

2

20.8 How do you synchronize two 'NetCal'?

Trying to remember and put things to let wife know the teaching time and when she cannot hold of me. But would be nice if these two can be synchronised.

3

3.12 What do you your wall calendar for?

Personal meetings, major things like holiday, exam dates to glance it. Use it because it was given as a present. To "...glance it..."

13.3 Were you using any other calendar before becoming a member of staff?

Had a paper diary before started working here. At home, I have a wall calendar in the kitchen to write down personal appointments.

4

6.15 You seem to have a lot of meetings and you don't print them out?

Prints out when I go away. When I know that I have a busy week when I come back then I use it to remind myself things that have to be done in that week.

11.13 Were you told to use it?

"Occasionally, CL sends around email saying, 'have you all put your timetable in?' It will be helpful if the timetable is automatically put into my calendar..." even though I would still print out for a quick view.

16.2 Do you have any back up?

Print out to plan ahead since the incident happened. Printed out four months to plan holiday etc. Good to view four months together. To see whole summer.

5

6.1 You did put 'very much in pressure', can you explain to me what you mean by that?

"The head of school one day decided that we would use 'NetCal' so the school office can arrange meetings so initially, there was a lot of pressure. Initially, I have to admit that I did resist a little bit um...but then after about 10 minutes, I realised it was a quite useful"

6

6.21 Any advantage you can think of?

It is in a system so not going to lose documents. You can lose a diary but it is in system.

13.3 Were you using any other calendar before becoming a member of staff?

Had a paper diary before started working here. At home have a wall calendar in the kitchen to write down personal appointments.

7

6.13 Do you feel you need a backup?

The most important thing is the teaching and I have a timetable on the notice board.

16.2 Do you have any back up?

Print out to plan ahead since the incident happened.

8

6.29 There was a day when the system was down so how was it for you?

Good excuse to blame the information system for not knowing the meeting but knew the teaching timetable and other important things.

9

3.16 Do you think there are disadvantages?

"If you rely on it too much and if the system goes down, you could end up not knowing what you are doing...I have a teaching timetable up there which I usually memorised it anyway..."

6.11 Do you have any other calendars?

'NetCal' is the only calendar and it is a big problem. Sometimes, network is not as reliable.

6.12 How often do you view your calendar?

In the morning he has to see what the agendas are for that day and once or twice it happened that it took around 10-15 min to open up calendar so it was a problem.

10

Once she was scheduled through 'NetCal' to meet the division leader as her calendar says she was free. However, that was right before the first lecture she had to give so wanted to spend time to prepare for it. Therefore she declined it with explanation but later when she bumped into the division leader in the toilet, she was told that she was not happy that the appointment was declined. For her, because the calendar says free the division leader expected it was free. (free in the calendar does not mean that the person is free)

11.3 How was the idea of sharing calendar?

"I have no problem with that. The only problem is that I forget to put something in and people are assuming that I am free. That occasionally but not very often happens"

11

3.15 What do you think are the main advantages of 'NetCal'?

"I think it is also useful if you want to have an informal chat, just to speak to somebody..." Useful to check availability for an informal chat to see when someone is likely to be free.

13.17 How many meetings do you arrange?

If I want to talk to someone in the building, I would go and knock on the door first (if they are near by) then if they are not in then check their availability on 'NetCal'.

3.23 When would you view other people's calendars?

When I just want to speak to them briefly but in case they are not in the office both formal and informal.

6.24 Does 'NetCal' helps communication?

Cut down phone calls, emails, coming around. For example, working on a project with biology department and they do not use calendar. To organize meetings, end up with 50 emails, who can make it or who can't.

20.11 Do you check someone else's calendar?

"If I am looking for someone or got to speak to them, before rush around, look at the calendar, are they in?"

12

3.15 What do you think are the main advantages of 'NetCal'?

"I think the main advantage is you can arrange a meeting with other member of staff without having to either email or calling to their office"

11.7 How has your work changed?

"Find much easier to find time to meet with people because I can look up when they are available and find a suitable time"

16.14 Do expect people would accept the meeting request more?

Everyone would accept, normally people do. "...If you try to get 5 or 6 people together... sometimes, it is so difficult to find a free slot and when you see one, you go for it. and your expectation is high"

13

20.15 When you receive a meeting request through 'NetCal', do you feel you need to accept it because your calendar says you are free compare to phone?

It is easier to make decision whether to attend a meeting or not because I can see who are being invited. Through 'NetCal', I get more information on the meeting.

14

11.19 Do you block some time off for your research and etc?

When I do not have teaching and work from home, I block off and I expects others to do that. But when I want to see someone and a whole day is blocked off, I might speak to the person to see how the person feels about it.

15

6.18 You said, delegating tasks and you put 'neutral'. Can you explain to me what you mean by 'neutral'?

"I don't like sending tasks to people. If I am going to ask someone to do something, I prefer to do it face to face or ask by email. I do have a odd colleague who sends me task and I know how I feel when I get sent a task by someone who is a colleague. I can understand if it is sent by a head of school or a head of division or whatever but by colleague is wrong, it is not polite"

16

16.15 Would you say there is pressure to accept a meeting request more?

Possibly a little bit of pressure to accept the meeting request. Decline it with a good reason and not just decline but give a reason as well.

17

3.20 If you are going to arrange a meeting with someone in this room, would you still use 'NetCal'?

"More likely, I will say to them when you would be likely to be free and, or I might look at the calendar and then see. I wouldn't just set up a meeting without talking to them"

18

7.12 Do you think there is a privacy issue?

"I wasn't very keen on the idea. Before I was really used it, I wasn't sure how it worked and anything then I thought, gush, you know, I've got to justify my existence in a work schedule. You know, have time blocked off for whatever otherwise people will assume I was doing nothing but that hasn't really turned out. I don't think people do do that, you know"

19

11.13 Were people told to use it or would they just find out?

"...It will be helpful if the timetable automatically put into my calendar..."

6.20 What changes are there after using 'NetCal'?

"The biggest change is I am much happier that I know what my agenda is at work. In the past, there might be a meeting arranged and by the time I got back to the office, I get totally forget to put in the diary, forget the room number whereas if email comes with task or meeting, it is pretty automatic"... All the details of the meetings are put into a calendar directly.

20

7.3 Do you think there is any changes in the way you work?

Not sure if work productivity has improved since using 'NetCal', maybe marginally. It just has changed. Getting too many emails and it becomes a job in itself. There are more emails from the admin staff.

21

20.24 Is there any other advantage or disadvantage of 'NetCal' that you can think of?

Interface could be better to give a better overall picture. The way it is structured with the week or month view it is not good. More up to date interface would be useful. Maybe need revamp in interface to easy to utilise.

20.25 Do you use a task pad?

Used occasionally but it is not easy to use and functional. Use it once or twice a month when there are a lot of things that I have to remember and get it done "...It is not easy and straightforward..."

22

11.14 'NetCal' gives a warning but still accepts double booking, what do you think about that?

Important to have double booking "...because sometimes I want to be double booked. What I find, a bit of an issue. I want to know that the meeting is going on. And I can look back again even though I won't be attending it so I can for example send out or you know, tell other people or meet a colleague just before the meeting. If I decline a meeting, it disappears from my calendar. Quite often put things tentative even if I know I won't attend so I can keep it as a record. Sometimes want to know that meeting is going on even though she won't be".

23

3.14 Do you use access your calendar from home?

I can but not often. Access email from home and look at the calendar just to remind myself what I have in the next day.

11.9 How often do you use a Web-based calendar?

Maybe once a week. "...If it is a weekend and I am thinking maybe I don't have to go in tomorrow morning something like that..."

24

7.6 What do you think about arranging meetings using 'NetCal' compare to phone calls etc?

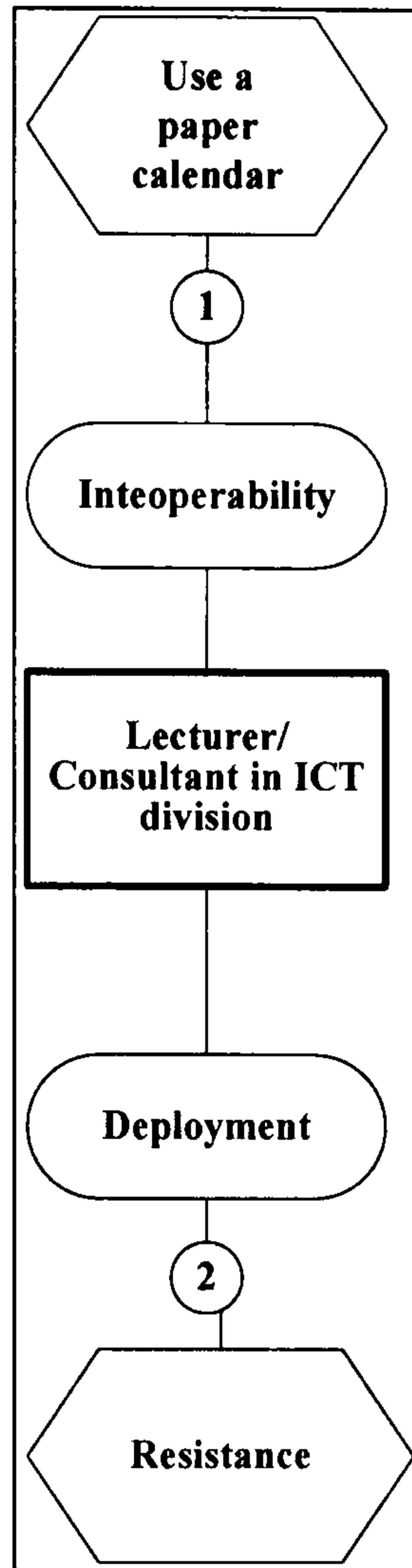
Actually aspect of using 'NetCal' to see the availability is good but a lot of colleagues don't keep their calendars up to date so it comes back and saying 'sorry, I can't'.

25

6.10 You mentioned some pressure from colleagues for up to date. Can you describe for me what sort of pressure you mean by that?

"My division leader wants to know when I am not available and when I am available so she puts pressure on me and sometimes someone's organizing meetings and say, 'are you sure that you're busy all week, next week, thinking that I am just filling up the calendar'".

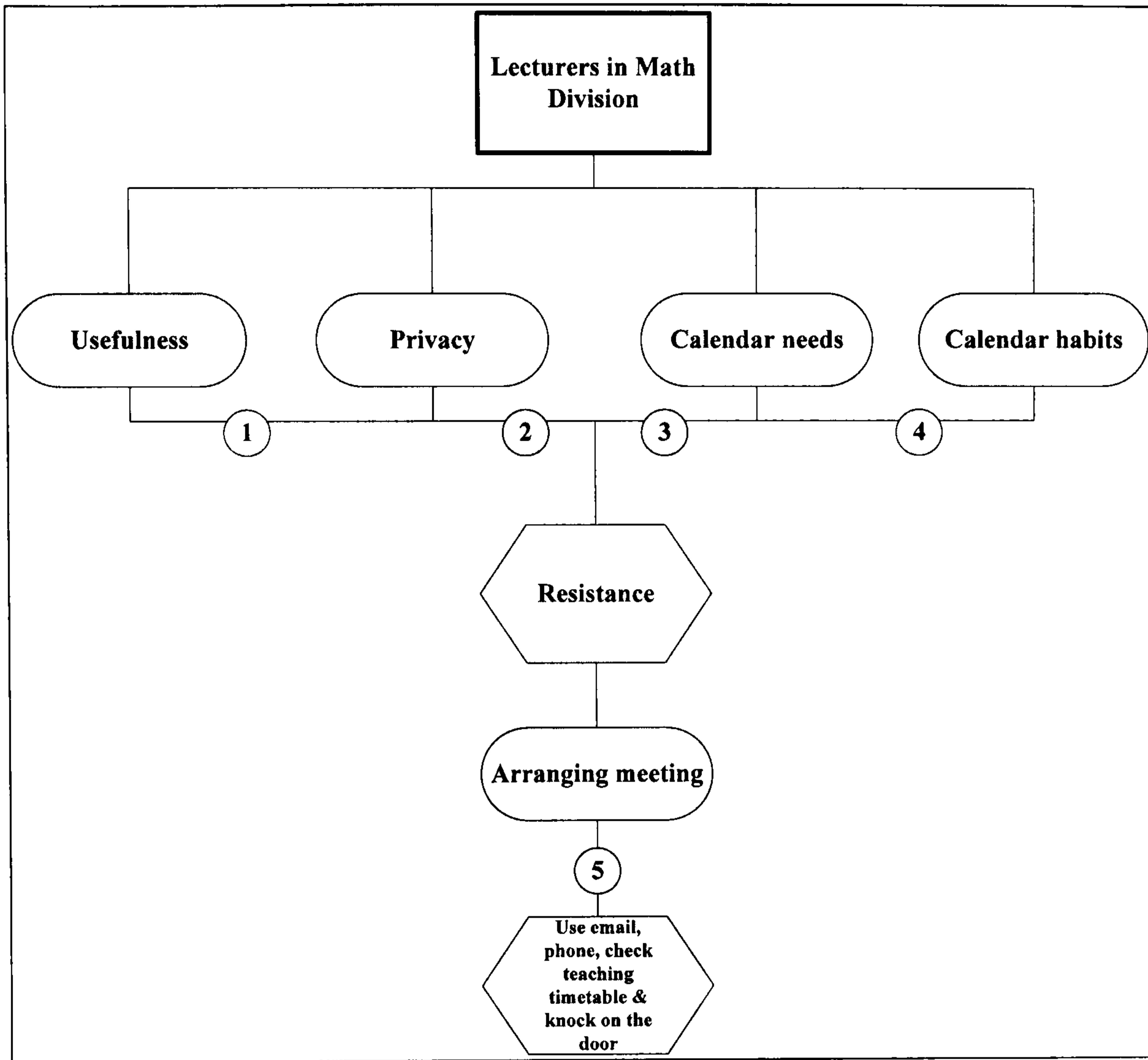
Lecturer/Consultant in ICT Division



①
5.7 Have you used any other electronic calendar?
 No but looked at them. It takes all morning just to get on the network system. Everybody is on different network. Paper is the easiest. Because I am a consultant so it is easier to use paper calendar.

②
5.14 No pressure here then?
 “No, I wouldn't want it in here because it's different kind of work...” Academic needs time to think to be creative. Don't want them to know what I am doing, Enjoy the freedom that I'm allowed to be. Don't want to focus on meetings, tasks and activities, don't want to be task orientated and managed. Nature of business is different. Freedom and creativity are very important.
5.15 How different?
 Your work is billable. In here you are an academic. You protect your time as much because that is when you can think. For academic, GCS is not important. "...well, you know, I am sure my colleagues have been saying a lot of time that wish they didn't know where we were and what we were doing because if they don't know what we are doing and where we are, we then probably doing something valuable. Probably more valuable than sitting in a meeting, that's true...” The question is where the high value is generated. Don't think a project management solution is a right one for academic environment. There has to be some in there but has to think about how academics work and accommodate between resource schedule and what they have which is time.

Lecturers in Math Division



1

2.6 You don't think 'NetCal' offers that?

"...You've got to enter there (indicate the screen) again and plus computer crashes then your diary is gone. It does, it does go down from time to time..."

2.12 What are the differences between paper and electronic?

I can carry a paper calendar and doesn't fall down.

2.13 But then you can have a portable electronic calendar to carry?

Don't want to carry stuff unless I have to. Carry a calculator which is an essential tool. Time spent on putting information in and out is more troublesome. Don't use a mobile phone.

2

2.8 Isn't it easy to use calendar if you use 'NetCal' email?

Use email a lot. "...Non of their business what I am doing..."

2.27 Many people are using it and you are not convinced?

Even if it becomes compulsory, I still would not use it.

2.28 How do you get away with that?

"...You've got to live in autonomy..."

3

2.2 How do you arrange meetings?

Use a desk diary, "...could not live without that (paper desk diary)"

2.17 Do you keep all your paper calendar?

Have been keeping diaries since 1970.

2.18 Why?

"...Sometimes nice to look where you went on a holiday that year"

4

2.11 How many calendars do you have?

One for work (a paper desktop calendar) and one for personal (a pocket size paper calendar) use.

5

2.2 How do you arrange meetings?

Arrange a meeting usually by email or phone.

2.4 How people arrange a meeting with you?

People can phone up or send email or knock on the door.

1

10.8 What do you do if appointments occurs while you are on move?

Memorise it.

15.2 Do you have any other calendar?

No other calendar, no diary, just memorize.

2

10.9 Have you used any other calendars?

Used paper calendar until this academic year in conjunction with 'NetCal' but synchronization problem occurred so decided to ditch a paper calendar. Prints out 'NetCal' and writes things on it so not to forget and take it home during holiday. Used 'NetCal' for the class and a paper for teaching note. Relied on paper diary but now rely on 'NetCal'.

3

15.7 You don't use calendar at all?

Use email to remind myself what I am supposed to do on that day. Keep emails (invitation email, accept the meeting but use email to keep record)

15.9 Are you using email inbox as a calendar?

Use it to remind myself. Things I am supposed to do stays in my inbox. Once a week clear the inbox. Jobs to do. Around 50 emails in my inbox.

4

5

10.2 Is there a pressure to use?

There is a pressure to use and expected to use it. "...As more and more people use it, more and more people use it..."

6

4.25 How do you feel now?

"In some senses, I don't like it because I becomes over reliant. I knew that I was in Glasgow some point this week but I didn't know when because it was in my calendar but it is this Friday. It is a fact that it's sort of dismissed in my head... because of the security of being there. And also I don't look at my calendar from home so, an occasion, I have come into work and realised that I had to be somewhere very soon or find myself in a 9 to 11 meeting when I had in my mind doing other things. In that sense, it dominates time and risk of losing a track of what you are up to because you become over reliant. There was a time that there was a power cut, I think, yes it went off for about two days and it was great. No email for distraction, No meetings, I didn't know so I couldn't go... The ones that I wanted to go, I remembered. It was quite liberating when the system was down".

4. 28 How accurate is your calendar?

"Normally, keep it up to date because I am fairly depend upon it"

10.7 What are the advantages?

"It is a central repository of all our meetings and I kind of lost without it..." Access from home is not easy.

7

4.6. How do you use 'NetCal'?

I block some time off for my own research and for work so my calendar looks full and when Phd students see it then it will look busy because it shows only free and busy. So students book in a wider interval - not very useful because I want much more short but frequent meetings with them. Important to see students when it is needed.

10.13 Do you block time off?

Got to block some time off to make sure people don't fill it up. You've got to block it off some time because not many time is available during the term time.

10.15 Has 'NetCal' ever failed when you tried to arrange meetings?

It can fail because people block day off so people have to book further away. There is a lack of judgement because it is not contextual and because it only shows free and busy.

8

10.4 How useful is it?

Sensible way to arrange meeting is using 'NetCal'. When people have different working hours then it is easier to use 'NetCal' to arrange meeting. Teaching 14-15 hours a week. People work in a different time.

9

15.3 How do people arrange meeting with you?

A division meeting is held at same time, same place and same day so I know. Even if there is nothing to discuss, we have a meeting once a week.

10

4.15 Is that mean that you learned...

"Yes, the other issue is, it is very very difficult sometimes to predict when you might want to talk to someone. I got stuck with a problem on last Thursday morning and someone was passing, 'can you give me a hand on this?' for 25minutes. I could not have seen that coming as a particular meeting so there are many many more informal meetings...sometimes I spend a half of the day just going around to different people to see what they are doing, what they are up to. There is no way that can reasonably fit into 'NetCal'"

4.29 What about other people's calendars?

Never really had a trouble. But it is not entirely accurate though. "...For example, I said, I have a meeting at Glasgow this Friday and the meeting request was sent from 10, start of the meeting until 2 which is the end of the meeting. Effectively, I look free before 10 and two to five but I'm not so I have to then augment the meeting request by probably separately putting time of start and the end as two separate events because if I stretch the box, then I am changing the meeting time that other people don't know so I can't just stretch the box".

4.36. Do you think that Outlook helps ad hoc meetings or informal chats?

"No, when I am free, I am at my desk and looking free. When I am not, my head is in book and I don't want to be disturbed. I think that is most important part. I don't think you can take a people part out of this. It's really a cliché thing to say but that is what's all about"

4.40. Even if you can see the their calendars?

No, because not everything goes to calendar. "...It does not deal with context" unless it is open but then there is business sensitivity so it won't be a good idea. You can have busy, it can have somebody busy, it happened to me, it says I am busy but next day I am clear...The fact is that I could be arriving at the airport from Edinburgh at 2 o'clock in the morning on previous day but by the time I get home it's 4 o'clock. I am not coming until half past 12. That isn't in the calendar that I am not coming in so then schedule me to travel back to London, having just got in from somewhere else, no, no thanks. So it doesn't capture that"

10.15 Has 'NetCal' ever failed when you tried to arrange meetings?

It can fail because people block day off so people have to book further away. There is a lack of judgement because it is not contextual and because it only shows free and busy.

11

4.13 You are part of a research group. How do you arrange meetings?

"If I am trying to arrange a meeting on this floor, it is depends on who it is with. Some member of staff prefer to use calendar, sometimes just talk to them when they look free..."

4.14 Is it depends on their preference or your preference?

"I think it is a little bit of both but if it is me looking for a meeting then it is their preference mainly".

10.7 Do you think that 'NetCal' helps an informal chat?

Would not use 'NetCal' if I need to talk to someone next door for an informal chat. Depends how important it is but would go and knock on the door if the person is on the same floor. Depends who that is and what relationship I have with. I would make an appointment to meet someone from Information services.

12

4.33. So you think it should accept that conflicting...

"Ye, yes absolutely, I think you should be able to be double booked for yourself. I don't think any software should preclude you from having two meetings parallel..."

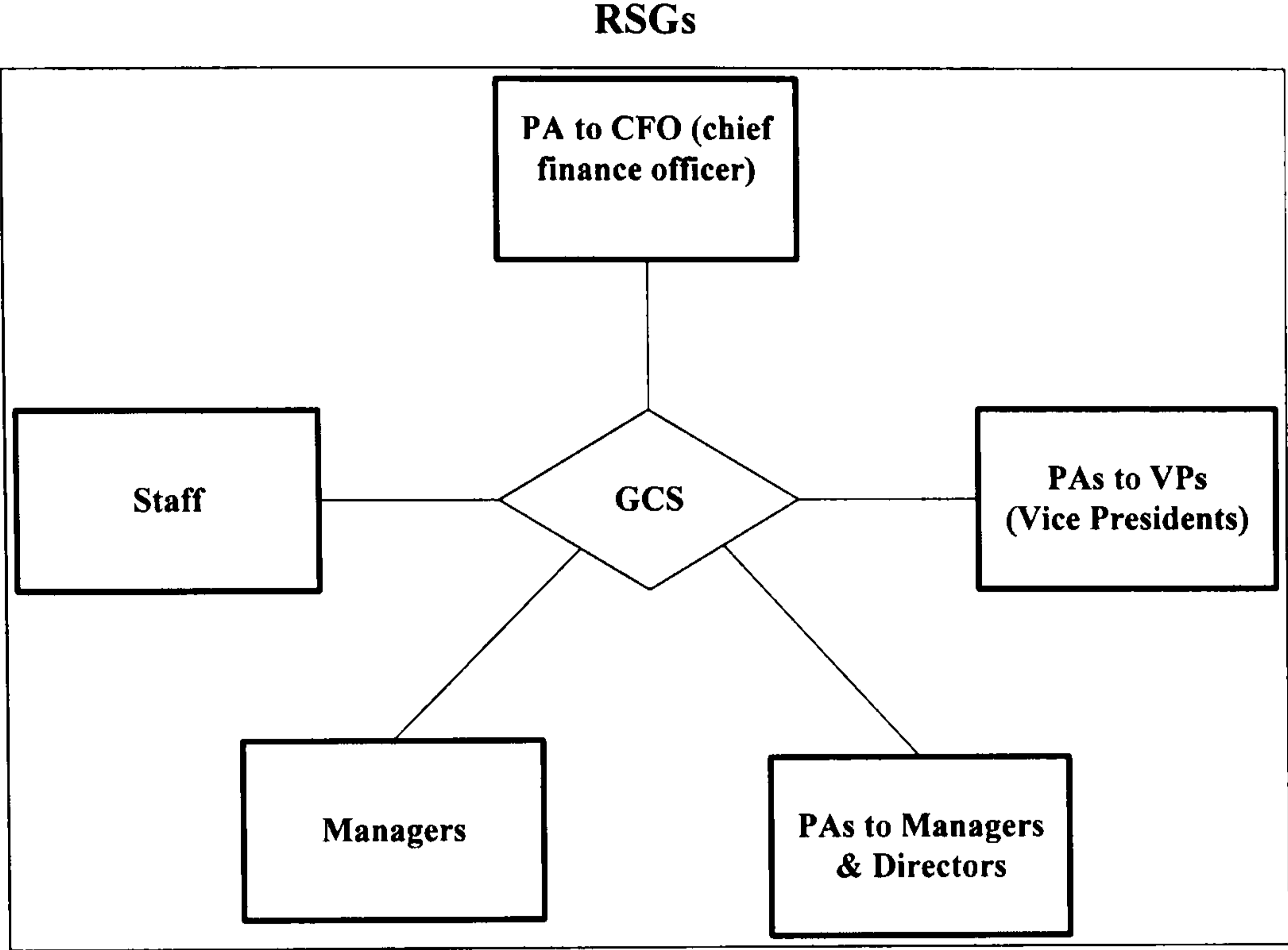
4.34. Why is that?

"That is my choice, not software's... If it is not clever system, it will choose the first one that went in but some priority need to be override... I need to make that choice and 'NetCal' lets you do that..." I have to be able to decide which is the most useful meeting to go to.

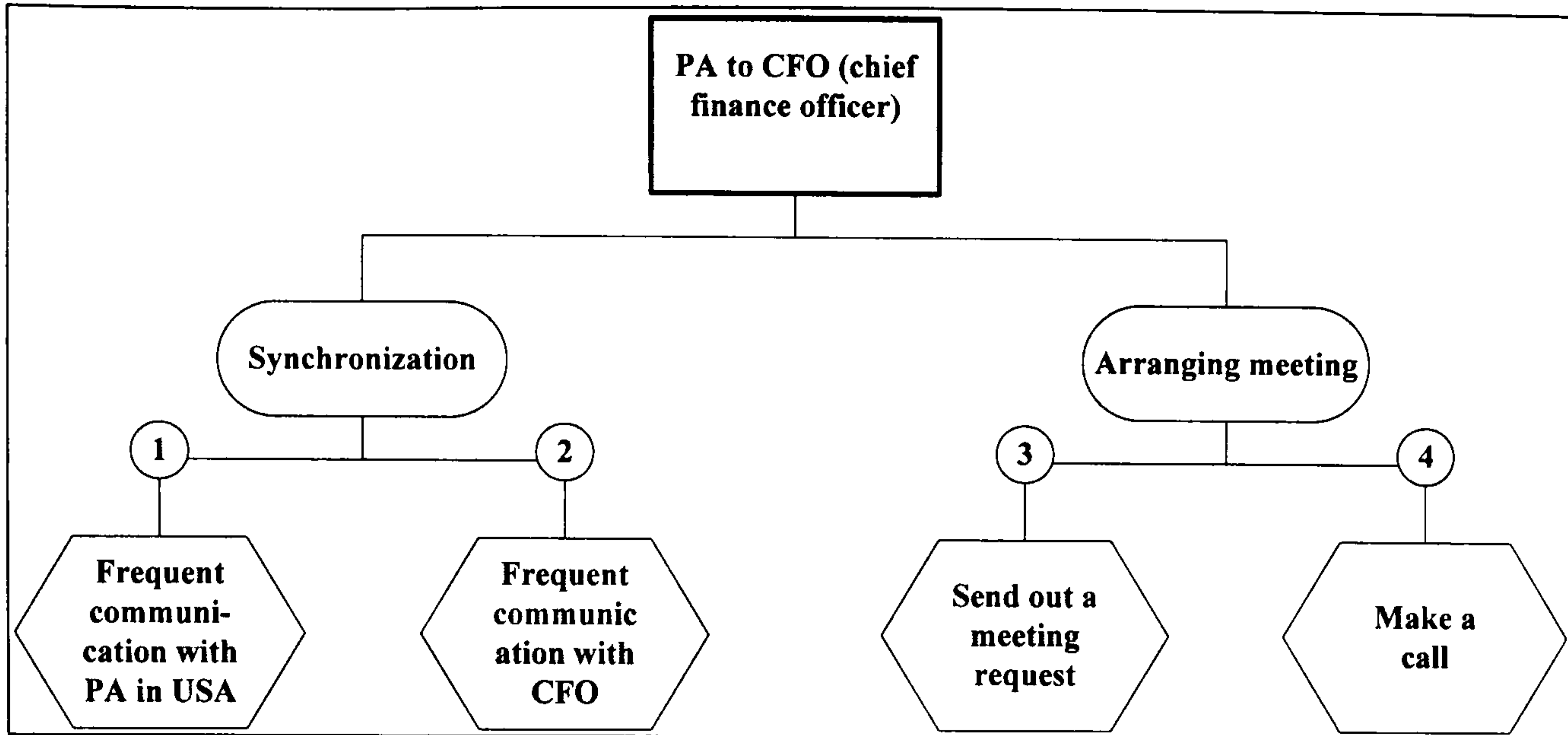
10.18 What do you think about accepting double booking?

Should accept. Depends on priority and I will make a judgement.

C. 4 'CIM' M-SCOT framework analysis



PA to CFO



①

10.8 He must have schedules in the USA.
 He lets me know about his schedule in US by phone, email or forwarding emails to me. He has another PA there helping him. I communicates with her (a PA in US) as well using an internal telephone line maybe once or twice a day because he needs a lot of documentation regarding MEMA or he needs to sign a document etc.

②

10.9 So you talk to him often.
 I speak to him when he gets up and talk about what is happening and what he has so on. Talk about calendar and emails. I let him know what I did, who I have delegate the job to etc. "...so, it's not that I don't know the job, it's just trying to get used to somebody else who you work with. When the PA in US arranges a meeting, she copies me so that I can block off the time.

③

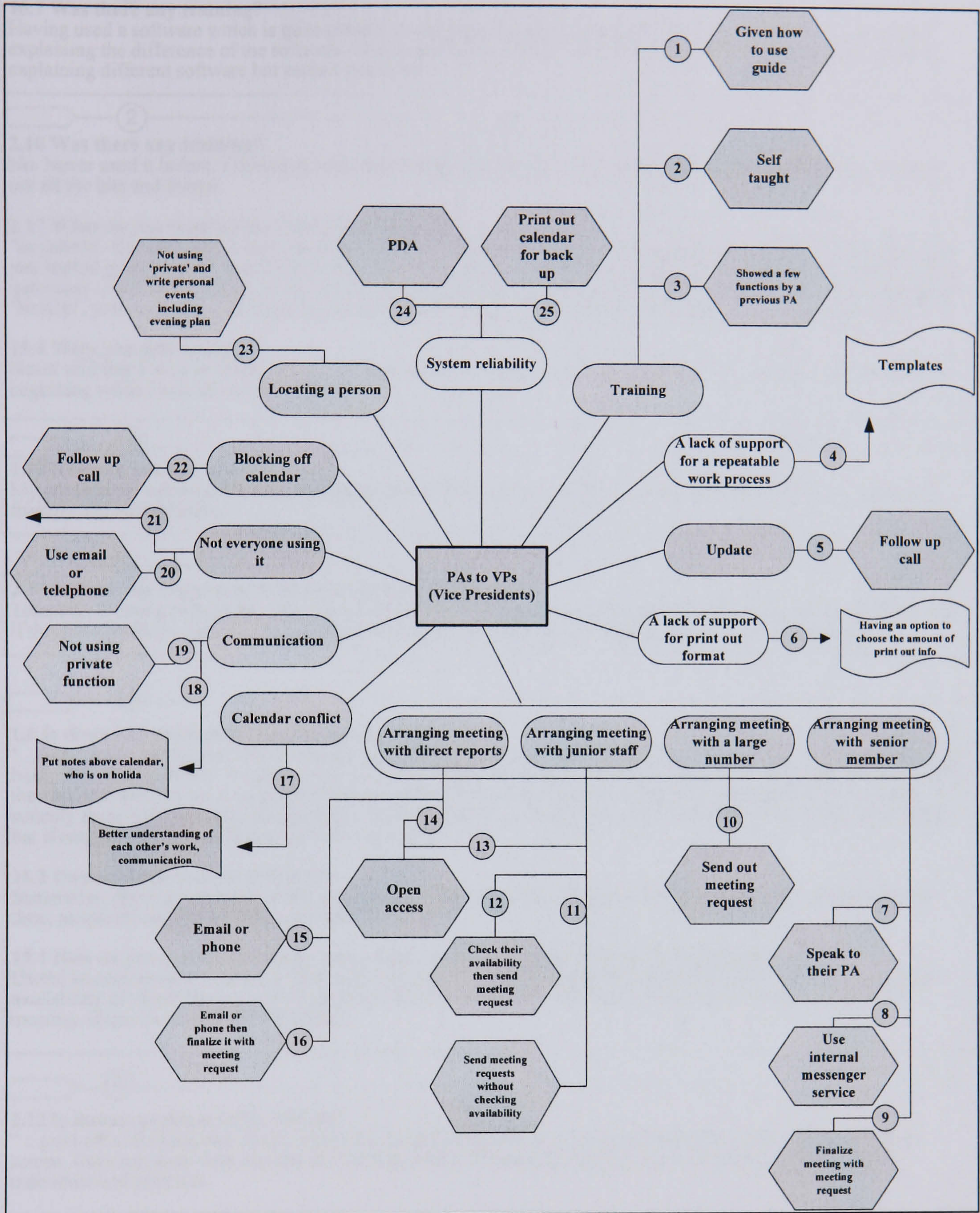
10.2 How do you arrange a meeting for him?
 Depends. When Asia Pacific and America are considered, because of the time differences it is difficult to arrange meeting and they are also busy. When organising a meeting with people (controllers) in Europe, he takes a priority so my work is easier. I send out email. When I send out email for a meeting request, I not only send it to the attendees but also their secretaries so that they can rearrange the schedule.

10.4 When you arrange meetings, do you check the availability?
 Look at the availability at all time but it is the only time that he can do then add a note saying that it is the only time that he can do so please make yourself available. And if it is a mandatory meeting, I put, it is a mandatory so you must attend.

④

10.5 How different is it for you when you arrange a meeting between USA where you cannot see the availability and Europe and the rest where you can see the availability?
 Because of the time difference, they might not have time to check their email so sometimes making a phone call is better.

PAs to VPs



①

16.7 Was there any training?

Having used a software which is quite similar, it was okay. But there was laminated guide has been given to staff explaining the difference of the software. How to use guide. When I first joined the company, there were courses explaining different software but cannot remember.

②

2.10 Was there any training?

No. Never used it before. I turned up and started using it. 'NetCal' is extremely easy to use but takes time to figure out all the bits and things.

2.17 What do you think about 'NetCal' in general?

"In general, it is very user friendly because I had no training on it. I just started going through when I first started, I just started going through menus and tried and error, you pretty much can't blow up your computer in 'NetCal'. It's quite easy...whereas if you try to use Access things like that you can quite easily lost and to do lots of damage but in 'NetCal', you can't really do anything too stressful. It is quite user friendly and the Help topics are very useful..."

15.4 Were you told to use it?

Never told that I have to use it. When you open email, it comes up with calendar. I started using it for myself in the beginning when I was an assistant PA.

③

1.12 How did you learn?

My predecessor sat me down and showed me few of the functions so it was quite straightforward. It is a quite user friendly and easy to learn.

④

2.19 Is there any suggestion to improve design of 'NetCal'?

Template. Meeting request has only time and place information but I want to have 'if there is a problem tick a box or if there is a problem, call my PA and things like that instead of typing out same thing over and over again.

⑤

1.6 Is there any problem in scheduling meetings?

"...many times, people just block a whole day that they are busy...that's when you have to call to actually check why busy, what does it mean". People sometimes forget to put that they are on a holiday so "...looks free, you assume that they are free and you set it up and the last minute you will get a message or something saying that 'no, I am not actually there' but your calendar didn't say that so if people use it as it should be used then it will make a life simpler but if not, we just have to follow up with a few calls"

11.2 Do you check their availability?

Sometimes, check availability before arranging a meeting but also always verbally check as well because a lot of time, people do not update their calendars.

17.4 How do you arrange meetings with people under her, would you check availability?

Useful because people I normally deal with are the senior members and they all use 'NetCal'. Maybe I look at the availability of others but not everybody keeps their calendar up to date and tend to expect people to attend the meeting. Depends on who the attendee is.

⑥

2.12 Is there a problem with 'NetCal'?

"... print off a working day, it only shows the limited information..." Does not print out a whole thing shows on screen. Does not show who sent out the meeting which is important for my boss. It means that I have to go to individual and print out.

⑦

2.3 How do you arrange meeting with junior members?

If it is with someone on a same level or above, you ring a PA to arrange time because it is a junior members, "...all you need to do is, I can see their availability without having to ring them whereas more senior is more full their diary is so you are going to have to get someone to rearrange something and also the senior PAs don't like it when send out a meeting request without asking so you have to be very apologetic..." Only senior and above, make a phone call.

14.13 How do you arrange meetings with senior member?

To arrange a meeting with senior member, I speak to PAs directly. Don't check the availability.

16.11 How do you arrange meetings with his level or above?

Liaison with other PAs.

18.6 Would you check the availability?

For the key personal, I would look at the availability or check with their PAs. With people who is higher, would not check availability and it will be back to back and too busy that I will check with the person's PAs and agree time and make it tentative until I get everyone for the meeting.

8

11.7 What do you mean by follow-up?

Because she knows there is a problem in France, she does a follow up.

With a director or above, she makes a phone call or use an instant messaging. Some PAs to VPs sent a meeting request and then send another email always with same information on it. It annoys but understand that when you have European people, there is some problem and they may not get the email. Sometimes, there are so many email, it is confusing if it is cancelled or time has been changed since meeting time changes constantly

9

11.1 How do you arrange meetings?

She picks a few dates that her boss is available and then send out emails to all the PAs to let them pick up the date and then finalise the date. She will then send a meeting request with all the necessary information

17.8 When arranging a meeting with senior members, how do you arrange meetings?

The higher you are, the more difficult it is to arrange a meeting. It might be easier to call and organize a meeting with some people whose calendars are busy. When you secure the time slot then send a meeting request

10

2.4 Do you check availability when you are arranging meeting with a large number of people?

If there are around 10 of them, she would check their availability because if 5 out of 10 are busy is not good but if it is over 20-30, 40 then just send out and say please rearrange your diary to fit. Because you will never get 30 people agree on the time.

2.18 Do you think it increases work efficiency is neutral?

Have to arrange 9 net conferences for 50 to 60 people, time it takes to set up each meeting is a very long complicated process because you have to find email addresses. You put more meeting requests, more slow down the PC. Took 20-25 min (net conference with people) to per meeting request. "It is not time efficient for a large scale". Send them to senior manager and ask them to send it out to people below

18.5 How do you arrange meeting with a large number of people?

You are not going to get everybody so she knows who is critical and essential to be there, VPs or directors then try to plan it according to the main players then if everyone can make it then make it. Calendar is not accurate because people put notes in their calendars so it may show busy while they are really free

11

2.3 How do you arrange meeting with junior members?

"all you need to do is, I can see their availability without having to ring them... There are around 140 staff below and it is impossible to deal with them so they have to rearrange their diary because it is extremely a large structure

11.4 Is there a difference between arranging meeting with your boss' level and with people under him?

Yes. She has to make sure she get them all together. When the meeting is with his above, he wants every to be there. Arranging meeting with people under, she picks a date and say, this is when it is just send it out then either they will accept or decline or send a representative

15.6 Do you check availability?

No and see what response is, Would not rely on availability. They have to rearrange for the meeting. People work around to meet his time. Don't really use availability because she doesn't know, busy is how busy.

15.7 Why don't you just use email?

Because then she will have too many emails back. People can just click yes and no and she can tell how many people are attending the meeting

16.10 How do you arrange meetings with junior member of staff?

If it is urgent, don't check availability and just send out a meeting request and let them sort things out.

12

3.5 Do not expect junior members to adjust their time according to email you sent out?

To certain extent but they might have a meeting with other VP. Would check their availabilities.

13

2.5 Do you have an access to anyone else?

Has an access to my manager (calendar and inbox etc) and ability to send out on behalf of him. Has also access to people who are direct reports (calendars and inboxes but don't have a same privilege. Can view and move around diary but cannot send email on behalf of them). In Engineering – I have access to 6 direct reports and move around their calendars because they don't have choice because I am asked by directors or senior directors and "...I am a messenger..."

14

1.2 Do you manage anyone else calendar apart from him?

Also manages one of the directors' calendar. Worked for him before and he has a new assistant but helping him a bit so his work can be shared between me and his current assistant. Don't do much but arrange a few meetings for him. Have all the write in access to both calendars. A few directors gave me a permission to look at their calendars "...for own peace of mind that I don't have to keep asking them..." Some gave me write in access and some gave me read only access.

1.3 Why directors gave you an access to their calendars?

Because my boss deals with only higher level managers. "...because my manager deals with the top level management so many of them have given me an access so I can see..." They have their own assistants but even the assistant found it handy to give me access so I can see all in one glance.

1.4 How do you arrange meeting for your boss with other directors?

Find the most convenient time for my boss because he has very busy schedule and try to see if all the attendees are free at that time by using 'NetCal'. Try to find time that most of the people can make it ideally but if not, see what meetings that they have and also see if they can move those meetings around to fit mine.

11.10 Do you have a calendar access to any other people?

I have an access to my boss' direct reports so if my boss wants to have a meeting with them, I do not have to bother them, I can just go to their calendars. But I would still check because not everybody is using 'NetCal' as much as I do especially in the lower level.

15

3.2 How do you arrange meeting with Directors?

"...If it was a multiple attendee list, I would either phone them or send them email to ask a date"

16

3.8 Is 'NetCal' useful tool?

Arrange meeting using 'NetCal' but "...you do a field work as well..." Use 'NetCal' availability for reference but "... it is not positive. It is not decider..." Once it is confirmed then send out meeting requests.

17

2.6 Do they put their personal arrangements in their calendars?

It is easier for me to know when can and can't disturb him. He sometimes forget to put things down.

11.5 Have you had any problem with sharing a calendar with the VP?

"Yes, sometimes, he puts in when he shouldn't and I am like 'what is that?'"

18

11.19 Is there any other usage of 'NetCal'?

I put messages above the calendar to let him know that if someone is on holiday or put things that he has to be reminded.

17.11 Is there any other usage?

There are three lines above the calendar, I use it to put notes.

19

2.6 Do they put their personal arrangements in their calendars?

My managers and direct reports don't really use 'private' tick because the hour that they work (from 8-8), it is easier for me to know when can and can't disturb him.

17.9 Does she put her personal arrangements?

Yes. I has to know where the boss is all the time in order to help work move smoothly so we rely on the calendars heavily. My boss puts her evening plans so that I do not arrange anything at that time.

20

13.6 How do you arrange meetings?

"It is normally done by email because not everybody uses it..." I send out email to arrange meetings and when the meeting is confirmed, I put it in the calendar..." Calendar say they are free but they may not be free.

21

11.15 How is 'NetCal' usage here?

It will make my work easier if everyone uses it but not everybody does.

16.4 How your work changed since using 'NetCal'?

It would be nice if everyone uses it but they don't.

22

1.6 Is there any problem in scheduling meetings?

"If they all use it well then there wouldn't be so many issues. Many times, people just block a whole day that they are busy....that's when you have to call to actually check why busy, what does it mean"

2.8 Do you double book meetings?

Don't tend to double book. But leave something in there so people can't see what his diary looks like. People can just view his calendar and send a meeting request so blocks out so they cannot see it. But things overlap so you say "...yes, he has a half hour, he won't be there first a half an hour..."

14.15 Do you block sometime for your boss?

Yes, especially between lunch hour. VP travel a lot so try to consider the travelling time etc.

14.16 Other PAs will call you to arrange meetings?

Yes, there might be things that they don't want others to see.

15.1 What do you do?

I have all write in access and sometimes they tell me to block sometime off as well.

18.5 How do you arrange meeting with a large number of people?

Calendar is not accurate because people put notes in their calendars so it may show busy while they are really free.

23

15.1 What do you do?

Mainly manages his calendar but there are two others that I sometimes manage in case when people asks whereabouts of the person, I can check the calendar and let them know when they can reach him. Because they are senior managers and people need to know where they are. I have all write in access.

17.9 Does she put her personal arrangements?

Yes. I have to know where the boss is all the time in order to help work move smoothly so we rely on the calendars heavily. My boss puts her evening plans so that I do not arrange anything at that time.

24

16.14 Does your boss use a portable calendar?

My boss uses a PDA to synchronise it with his PC calendar.

17.12 System can go down and you are heavily relying on it?

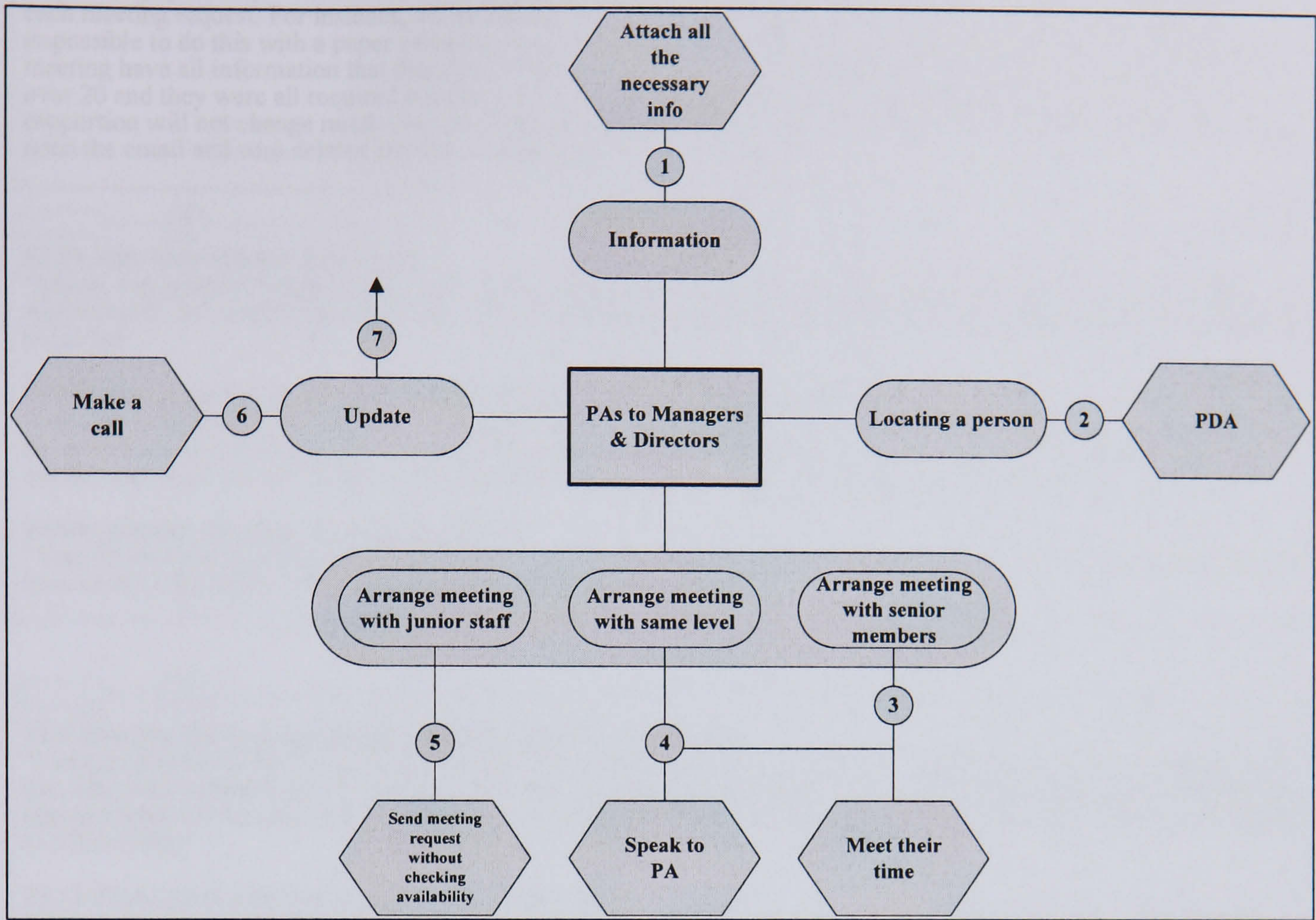
I back up in palm pilot. Sometimes prints out but not all the time.

25

3.15 Do you have any backup?

If I arrange a meeting, I print out and keep it in my '30 day file' so myself to know the day's agenda and if I am not in the office, I can tell the boss to look it up for that day's agenda and also the files go with.

PAs to Managers & Directors



1

20.20 Any disadvantage?

"If I had a paper diary, it is not worth thinking about. It is quite scary..." There are a lot of information goes behind each meeting request. For instance, all the links and conference call number and documentation etc. It would be impossible to do this with a paper calendar. By using a meeting request, I know that everybody who is attending the meeting have all information that they need. They can access without phoning me. I sent out one meeting request to over 20 and they were all required attendees and 'NetCal' shows who have accepted and who hasn't. But the proportion will not change much in a week time because people don't use it. I have to then call them. I also know who open the email and who deleted it without reading it.

2

12.16 How important it is to have?

"I think it is essential because how would I know where he is because so many people come up to me and ask his whereabouts and I can tell them, yes he is at this meeting, I can tell them what time he finishes, when he is next going to be free"

20.4 If you are going to check the availability, can you not just send emails?

"Because it keeps him organised and his diary can be very busy and things can go until 9 at night. I use 'NetCal' because it's easy to manage him and he can see what is happening and I have access to it. I can change things very quickly and also I have a PDA so I can synchronize with that so I can see where he is all the time".

20.5 Is it important for you to have a PDA?

"Yes, for me, yes, yes because he can phone me in the evening, at night so 'what am I doing tomorrow, what time do I have to be in the office?' then I say, 'okay, half past seven please"

3

12.6 How do you arrange meeting with someone senior to him?

"I will go directly to his PA. If someone senior, instead him saying to me, look at my calendar and see what time I've got, like if his manager say, 'I want to have some time with you' and his got four, five appointments, any of those, five appointments can be cancelled. It just drops everything so it will be down to his manager to elect the time, not for him to choose time"

20.13 If you get a meeting request, what happens?

"Out of my respect for other people, I would phone them and ask first and I would expect that from people certainly at DA's level but in VP level, I wouldn't. I then try to make alternative arrangement for my meetings..." If somebody send a meeting request without checking with me first, my boss knows that I would decline it. "...I decline it, I don't care. If somebody just hasn't had a decency to actually phone me and check first, I will just decline it"

20.17 It seems to me then, 'NetCal' is not useful for arranging meetings with senior members?

"No, it's the PA who is the fundamental part of this...I would not dream of sending a meeting request to Susan..." (who is a PA to the person who is higher than her boss) Once you get to certain level, there is expectation and would not send out a meeting request. "...Not just it is useless but also out of respect for PA..." because instead of calendar availability, it is my judgement that is needed when managing the calendar. I know when he does not want to have a meeting and if the meeting can be waited for another week. "...It would be my judgement, not what the calendar's availability says"

4

20.13 If you get a meeting request, what happens?

"Out of my respect for other people, I would phone them and ask first and I would expect that from people certainly at DA's level but in VP level, I wouldn't. I then try to make alternative arrangement for my meetings..." If somebody send a meeting request without checking with me first, my boss knows that I would decline it. "...I decline it, I don't care. If somebody just hasn't had a decency to actually phone me and check first, I will just decline it"

20.16 Does this happen a lot?

I always call to check with other PAs who work for my boss' level and above.

5

20.3 How do you arranging meeting with junior members?

Don't check availability and "...just send it (meeting request) out and you will be there..."

20.11 Sales people are on mobile. How do you arrange meetings with them?

"Once you go below regional sales managers level, don't tend to call to find out their availabilities and I will just send them meeting requests"

6

12.5 If you arrange a meeting for him, do you see people's the availabilities?

"From time to time...use it when there are more than 6 or 7 people involved because it can get frustrating calling everyone. This is a quick and easy way. It can work in your favour if they use the calendar. Sometimes they say free and you book it and they say, 'sorry, can you cancel the meeting' but then they have not put it in their calendars. Sometimes, it is easier just to pick up the phone and call the person..." because people forget to update their calendar.

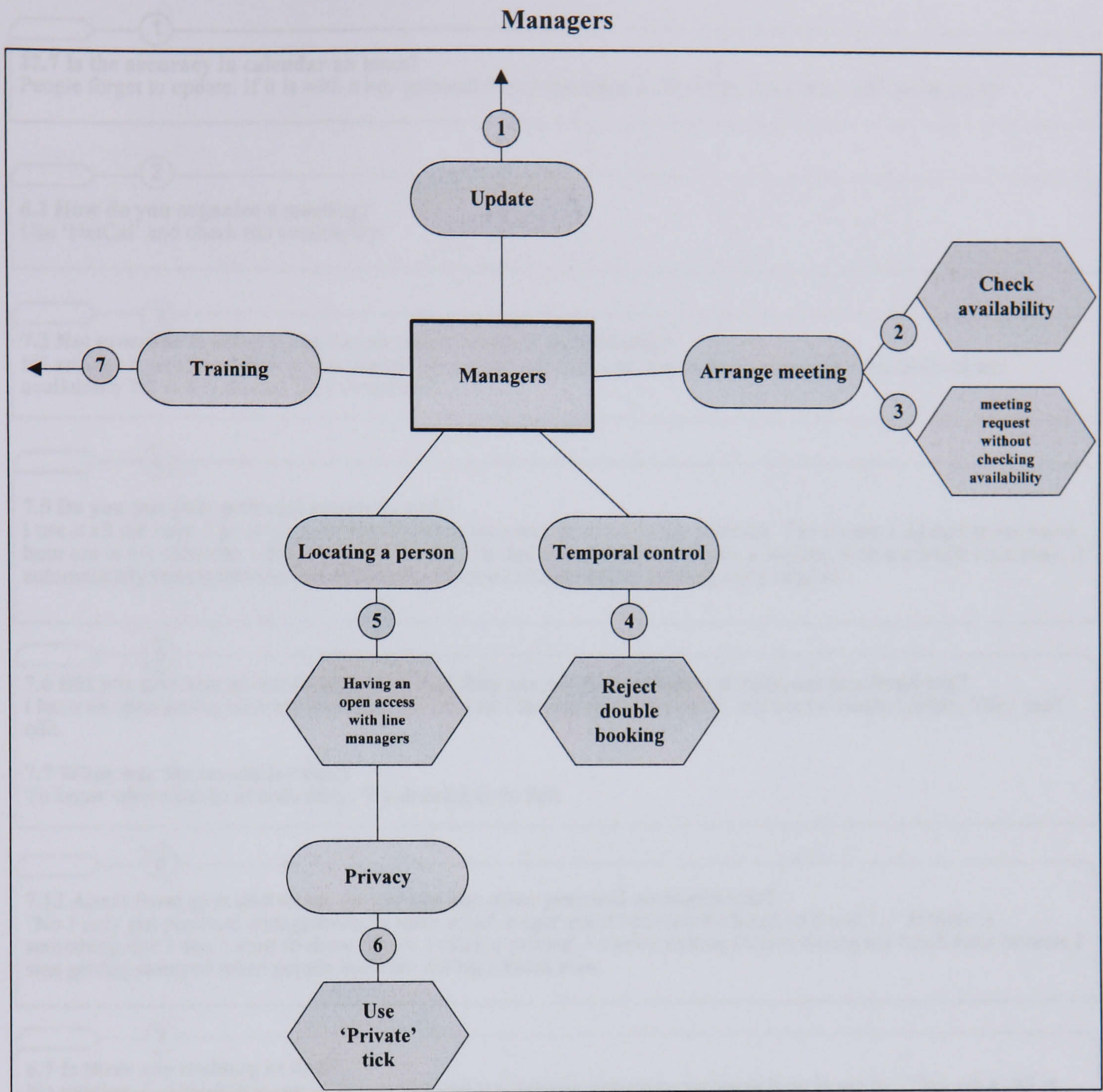
20.18 Do people are expected to use 'NetCal'?

I get frustrated if I go into someone else' calendar and do not see anything and when people don't put their holidays. I would like to see everyone's calendars looks like my boss'

7

20.21 Do sales people use PDAs?

Do not really use a PDA. In my previous job, my manager used a PDA and he would instantly writes down all his meetings etc but it took 2-3 hours until it gets synchronised with my calendar, that is when a problem occurred and did not work because he may not dock it for 2-3 hours and during that time I have booked something else and started to clash. He had to consult me before making a booking.



①

22.7 Is the accuracy in calendar an issue?

People forget to update. If it is with a key personal then I rearrange it but if not, I go ahead with the meeting.

②

6.2 How do you organize a meeting?

Use 'NetCal' and check the availability.

③

7.2 Not everyone is using it but do you check people's availabilities?

If I arrange a meeting, I look at the availability even if not everyone uses it. For 3-4 people I would check the availability but if it is around 20, I would not.

④

7.5 Do you put your personal events as well?

I use it all the time. I go to gym during my lunch time and these are in my calendar. The classes I do during my lunch hour are in my calendar. I did set up my 'NetCal' so that if anyone tries to book a meeting with me while I am busy, it automatically rejects because not everybody check a calendar before sending out a request.

⑤

7.6 Did you give any access to anyone so that they can see your calendar details, not just free/busy?

I have an open access with my manager, the director (her manager's manager), and my two team leaders. They can't edit.

7.7 What was the reason for that?

To know whereabouts of each other. We decided to do that.

⑥

7.12 Apart from gym and so on, do you put any other personal arrangements?

"No I only put personal arrangements in there which might affect between the hours of 8 and 7..." If there is something that I don't want to show others, I mark a 'private'. I started putting classes during my lunch hour because I was getting annoyed when people book me during a lunch hour.

⑦

6.7 Is there any training at first?

No training. "...I think it is one of the system that you assume that everyone know how to use it..." but get a call in computer support that they don't.

①

5.5 Do you have any other calendars?

Sometimes, I use a mobile phone to record things. Have used a PDA a lot when I got it in the beginning after while novelty wore off and stop using it. Maybe because I have a better mobile phone and it is smaller than before so I stop using a PDA and use a mobile phone instead. For reminder, a mobile phone is better.

23.7 Do you feel the need for a portable calendar?

Mostly in the office so don't need a PDA but occasionally uses my mobile to remind myself.

②

19.8 Do you have any other calendars?

Also carries a small pocket diary which I manually updates once a week. It is for my personal things. I have been using a paper calendar for a long time.

③

21.3 Is it just for your work or for personal as well?

Don't put non work related stuff just to be in a safe side. Without giving a permission, technical personal can see. Also not to jam it and clogged the system.

④

4.4 They send email to you to attend a meeting?

Just saying when, what time and where and not necessarily what for.

Universal one (a big meeting), I don't need to let the meeting requester know about the attendance possibility.

24.3 How do people arrange meeting with you?

There is one person arranges a meeting with me via 'NetCal'. When I receive it, I click to accept and then it goes into my calendar but I never look at it.

⑤

5.3 What do you mean by sometimes? Is it depends on events?

In my job, I do not feel the need for it. I call and if they are there, speak to them and if no, leave a message. My job is to do with dealing with issues. The time I use it for personal reason is to remind myself to do something for instance, I set it up on every Friday to remind myself that I have to fill a timesheet. Sometimes, this reminder comes on Monday instead on Friday. A manager puts entry in my calendar and I get a reminder. Don't know how the manager does it. I do not even have to say yes or no but then I do not think that I have a choice of saying no. "...It is a team meeting so you don't really have a choice of saying yes or no".

⑥

24.2 Is there any difficulty for not using it?

Never found it difficult for not using it. Easier to write down things on the paper calendar. You cannot carry 'NetCal'.

⑦

23.16 How do you arrange meeting with the management?

With a senior member, I would still check on-line availability and send a meeting request. Not check with their PAs.

⑧

24.11 How do you arrange meeting with a senior member?

Either call or send them email to arrange a meeting with a senior member.

⑨

23.15 Do you check people's availabilities even though not all use it?

Yes and "...assumes and hopes people update their calendars..."

⑩

19.2 Does this replacing the calendar?

It is a different function all together but it can be used to arrange a meeting, 99.99% accurate. Use a messenger to arrange a meeting with people who are possibly on different server because there are varied servers within this company so not always I can have access to people's calendars.

11

8.6 How accurate is the people's calendars?

People forget to update so it gets double booked.

19.16 What do you think are the disadvantages?

When people don't update the calendar, it is a headache because you might have to reschedule.

23.6 How different is it between paper and 'NetCal'?

If everybody keeps their calendars up to date then it will be much easier to arrange meeting. Using electronic is much easier.

23.10 Do you expect people to use and update their calendars?

"I can't stress it enough but it drives me mad if people don't keep it up to date. It has to be consistently used otherwise it is not useful..."

23.12 Then, how do we know that we need to use it?

"Because some people have a common sense. It's down to two reasons. It's a good idea to keep your calendars up to date so you don't miss appointment or meetings but it helps, makes everyone else's job easier if they keep them up to date"

12

24.6 Are there any reason why you don't use it?

Because it is not portable and "...it is a waste of time..." I could be in the car writing down an appointment and then I have to put that on computer therefore for me, it is a duplicating effort. "...easier to write it in rather than type it in"

13

21.8 Do you use it to delegate work and so on?

If I have a deliverable, use a calendar to record it and set a reminder. "...It advises you so you are always on time. You are never behind the schedule. It will remind you, you have this task to do and you have this task to do..." When I work with a senior member and people who need to submit something to me by a certain date, instead of phoning them, I set up a task for them to submit it by certain date with the reminder. If they fail to send me that then I am covered so a senior manager cannot do anything to me. I can do that from my desk and I use this a lot.

C. 5 Functional characteristics of GCS: 'SCS' and 'CIM'

'SCS' GCS functionalities-in-use

Functionalities -in-use	Characteristics	GCS calendar relationships		
		'Individual Calendar Relationships'	'Central Calendar Relationships'	'Collaborative Calendar Relationships'
Supporting Meeting Arrangement	Automated arrangement of meetings and the meeting change			1.6 3.14, 3.15, 3.23 4.6 6.10, 6.24 10.4 13.22 16.4 19.12 20.16 22.2
Supporting Communication Accessibility	Availability check for a chat		1.17 3.7, 3.15, 3.23 10.19 11.7 14.6, 14.14 20.11	3.15 6.10
Supporting Personal Calendaring	Personal time management and aid memoir	3.11 4.6, 4.25 4.34 6.15, 6.20, 6.23 7.7, 7.11, 7.14 8.12, 8.13 9.10 10.7, 10.13 12.14 13.8 16.8 17.5, 17.6, 17.8 21.20		
Supporting Distributed Work Coordination	Asynchronous work coordination e.g within line management structure, telework	3.14 11.9 13.14 15.8 16.11	9.15 14.6, 14.16 18.9	
Supporting Distributing Calendar Information	Information repository e.g locating a person, meeting related information		14.6, 14.16 20.10, 20.15 22.2	

- The act of 'locating someone' under 'supporting meeting arrangement' emphasises the checking the availability of people for the purpose of arranging meeting, 'locating someone' under 'supporting communication accessibility' is for the purpose of having face to face communication and the purpose of 'locating someone' under 'supporting distributing calendar information' is to

distribute the information of the whereabouts of someone in order to inform others.

- Viewing someone's calendar for the purpose of for example a chat is categorised as 'central calendar relationships' as the act is based on the viewing other's calendar in the form of a timetable.
- 'Blocking time off' is categorized under 'individual calendar relationships' as it is an act to manipulate the one's own time.
- Accessing the calendar from home is a function of 'supporting distributed working coordination' which forms 'individual calendar relationship'.
- Number of data filled in the boxes is irrelevant in terms of the significance of the functionalities since the interviewees could be repeating the same functionalities.

‘CIM’ GCS functionalities-in-use

Functionalities -in-use	Characteristics	GCS calendar relationships		
		‘Individual Calendar Relationships’	‘Central Calendar Relationships’	‘Collaborative Calendar Relationships’
Supporting Meeting Arrangement	Automated arrangement of meetings and the meeting change			1.4 2.2, 2.3 3.8 6.2 7.2, 7.12 9.2 10.4 11.1, 11.2, 11.6 11.16 13.11 14.8 16.10 17.4, 17.8 18.6 19.2, 19.3, 19.15, 20.3, 20.11 22.1, 22.4 23.16
Supporting Communication Accessibility	Availability check for a chat			
Supporting Personal Calendar ing	Personal time management and aid memoir	5.2 6.3 7.14 8.2 14.17 21.8 23.12, 23.14 24.9		
Supporting Distributed Work Coordination	Asynchronous work coordination e.g within line management structure, telework		1.1 1.2 2.6 10.1 11.5 13.1, 13.11 14.1, 14.3 17.5 20.4, 20.9	12.9 17.3, 17.5 21.7 21.8
Supporting Distributing Calendar Information	Information repository e.g locating a person, meeting related information		3.8 4.3 5.3 11.1, 11.19 12.15 14.4, 14.17 15.1 16.10 17.5 20.20	1.4 7.7 10.4 14.12

-
- Unlike 'SCS', in 'CIM', there is a GCS usage that people use meeting request function as a confirmatory and informing tool. It is to announce the upcoming meeting to others. This is categorized as both 'supporting meeting arrangement' and 'supporting distributing calendar information' under both 'central calendar relationships' and 'collaborative calendar relationships'.