

CHAPTER 3

3 METHODOLOGY

3.1 Introduction

Research design is important and requires evaluation independently of research results. This chapter is therefore concerned with methodological choice and the impact of this on the processes and outcome of the research. The main stages related to deciding the research approach, identifying data requirements and subjects, and the techniques by which data was gathered and analysed are examined. The final decision to present a single case study, derived using grounded theory principles to establish the role of an intranet in knowledge sharing, is justified with a description of factors that led to:

- the decision to develop a case study on the basis of data collected from in-depth interviews and corporate documentation;
- the development of the data collection schedules;
- the means of coding the data collected for subsequent analysis;
- a sociotechnical analysis of the data that employed actor-network theory.

From the outset it was recognised that there are problems associated with collecting data about the subject of knowledge sharing. Knowledge is perceived as an abstract, unquantifiable phenomenon. The assumption that knowledge in itself as a “shareable” entity is subject to philosophical debate. Therefore this research strategy accepted the term “knowledge” as employed within the case study organisation. The designation of the corporate intranet as a site for knowledge sharing was specified as a means of making visible such activity, for example, through serving as an artefact that provides domain documentation and formalises distributed cognition within communities. The work builds on earlier studies of knowledge sharing over computer networks such as those discussed in Chapter 2.

3.2 Grounded theory, grounded explanation and case studies

Throughout the research the aim was to adopt methods that were straightforward and practical within the limitations of resources available in terms of time, skill and expertise. These were logically and appropriately applied to reach the required level of detail to give robust results. It became apparent that a qualitative approach that aimed to generate grounded explanations and theoretical insight through case study description was appropriate for this work. As will be demonstrated, a single, deep case study that, although not an ethnography per se, is ethnographic in nature, produced findings of theoretical relevance, adding to the established body of work on the unintended consequences of technical implementations.

The work described in this thesis derives its approach in part from building theory through case research, a method advocated by Eisenhardt (1989). Eisenhardt’s (1989) strategy employs elements of the grounded theory approach to handle data collected from multiple or single case

studies in order to provide a deep, fully-formed explanation of what is observed in the environment studied. The specific factors that suggested that such an approach that drew on grounded theory might be appropriate for this research are summarised in Table 1.

Table 1: Opportunities of a grounded approach to the research

A grounded approach is applicable when...	Relevance of criterion to the research
...there is a lack of extant literature on the topic under investigation.	The literature review reveals few studies concerned solely with the role of ICTs in knowledge sharing in distributed organisations (see Chapter 2).
...there is an opportunity to investigate the development of new areas, for example the introduction of new technologies in the workplace, globalisation of the workforce and new organisational forms.	The work investigates the use of new technologies (intranet) by distributed workers in multinational (i.e. global) corporate settings.
...situated processes and actions in organisational contexts are to be examined.	The work considers situated processes and actions (knowledge sharing) in the corporate environment (a case study organisation).
...the anticipated output is an account that will be intelligible and useful to practitioners as well as academics.	It is anticipated that practitioners will be interested in the output from the research project.

(Sources: Locke, 2001, p. 18 & pp. 95-97; Turner, 1983, p. 334.)

Other factors pointed to the adoption of a grounded approach.

- It is commonly used in qualitative research on management and organisations with particular reference to social processes in social settings (Locke, 2001, p. vii, p. 42 & p. 93). This research is concerned with a social process (knowledge sharing) in an organisational setting (the corporate environment).
- In terms of the broad subject area of the research, there are precedents for employing such an approach for this research: it “has traveled extensively, for example... to information science” (Locke, 2001, p. 1). A goal of the research is to make a contribution to the domain of information science.
- It built on previous research experience.

On this basis, the decision was taken to adopt a grounded approach for the research, where the output is grounded explanation of what was observed, and the work’s contribution an addition to earlier theoretical perspectives on the multiple roles of technology artefacts.

Further decisions on the “flavour” of the approach had to be taken: qualitative researchers have developed the grounded research approach and combined it with other research strategies (Cook, 1982, p. 195). It is important to show awareness of the major contemporary variants of the grounded approach and the extent to which they are followed (Easterby-Smith, Thorpe, & Lowe, 2002, p. 47). Of particular concern was the field of study. The work by Eisenhardt (1989) prompted the consideration of employing case studies as a viable option.

On the basis of the case study characteristics, and taking into account the apparent limitations of employing case studies in social research, the case study approach was deemed appropriate for the work to be completed. The goal was to generate, by unbiased means, context-dependent knowledge that could be summarised in a valuable way. The decision to employ more than one data collection method (see page 41 below), with due acknowledgement of the

context of the environment from which the data were derived, contributed to the rigour of the approach. Generalisability per se was not be a major concern: it was deemed more important to produce a “good example” (Flyvbjerg, 2001, p. 77) to be read as a “whole” (Flyvbjerg, 2001, p. 86) rather than aim to construct a set of conclusions and then claim them to be generalisable. There are precedents for this approach. For example, Kling and Scacchi’s work on web models (Kling & Scacchi, 1982), as discussed in Chapter 2, was based on case studies. More recent research work on knowledge sharing and ICTs, also referenced in Chapter 2, draws conclusions on the basis of case study work. For example, Huysman & De Wit (2002) conducted their research on knowledge sharing based on data collected from corporate documentation and conversations with key informants (p. 6). The indication from the literature that knowledge-sharing practice is localised strengthened the argument for examining a single case in detail to discover the role of the intranet in knowledge sharing.

In practice, the study took a grounded approach combined with the use of case study data, where the data subjects’ place of work was the locus of enquiry, and the implementation of the strategy was influenced by the work of Eisenhardt (1989). She provides a number of situations where building theory from case research is appropriate. Elements of Eisenhardt’s (1989) approach were highly appropriate to this work. These are summarised with comments related to the specifics of the research undertaken in Table 2:

Table 2: Drawing on theory building with case research for the work completed

Theory building from case research is appropriate when...	Relevance of criterion to providing grounded explanation in this research
... little is known about a phenomenon.	Little was known of the role of the intranet in knowledge sharing.
... current perspectives seem inadequate because they have little empirical substantiation.	What was known on the intranet and ICTs in knowledge sharing appeared not to have been derived from systematic studies. Conclusions on knowledge sharing were more readily found as passing remarks in studies that considered other issues, rather than as the output of studies that had knowledge sharing over computer networks in distributed organisations as their main focus.
... current perspectives appear to be in the conflict with each other or common sense.	There were conflicting perspectives on the role of the intranet and ICTs in knowledge sharing. For example, levels of enthusiasm for the effectiveness of ICTs as tools of knowledge sharing were diverse.
... serendipitous findings in a theory-testing study suggest the need for a new perspective.	This was not strictly applicable, although interactions in the course of consultancy work provided hints that a new perspective on “tools” for knowledge sharing was necessary.
... research on a topic is in its early stages.	Previous work in this area had identified that one of the reasons why it had failed to derive firm conclusions was due to the immaturity of the subjects studied (Huysman & De Wit, 2002, p. 145).

(Source: Eisenhardt, 1989, p. 548.)

The work followed the dominant practice from case study research of guiding the processes of data collection and analysis by consulting summaries of previous research conducted in the area (Yin, 1994, p. 13). No specific hypotheses were established for testing. However, the extensive literature review provided a framework for the completion of the empirical work. To a certain extent, it set the terms for what might be found in the data collected. It informed the data

collection and coding processes in determining facets of the main data collection tools and suggesting coding categories. The ultimate goal of the work conducted was to construct a framework based on leads emanating from the case study data, yet recognised that attempting to avoid previous work in this area from the outset would be both difficult and impractical. As will be seen below on page 43 (on the sample of data subjects), and pages 45 and 50 (on data coding and analysis), the strategies adopted are not entirely in line with the practices of grounded theory. This was for practical reasons, as advocated by Miles & Huberman (1994, p. 16), and because the main aim of the work was to provide explanation, rather than generate, or add to, theory.

Since the adoption of the approach did not prescribe hypotheses to be tested, there is confidence in the validity of the results: they emerge from empirical observation, and the interview data is triangulated with the examination of company documentation. The results are open to criticism of being subjective, but this subjectivity is faithful to the views of the data subjects rather than the influence of researcher agency. There are some concerns about the extent to which conclusions to the project are genuinely conclusive: the results cannot provide a *complete* explanation for the phenomena observed.

Since the nature of a case study is determined by the choice of case to be investigated (Locke, 2001, p. 17) sample selection for this project was considered particularly important. There are several sampling methods available to the researcher, and the method of choosing a sample is determined by the context in which the research is being carried out. For research into the role of the intranet in knowledge sharing across distributed organisations by means of case study several of the sampling strategies identified by Patton (1990, pp. 166-186) might have been appropriate. For example, had an aim of the research been to present generalisable results on knowledge sharing practice between managers in a particular industry, then it would have been necessary to reflect the different types of company existing in that industry in the sample of companies. This could be achieved through the use of stratified random sampling.

In the event a single information-rich case was selected for an in-depth exploration conducted primarily through interviews and the analysis of company documentation. The single case study approach was adopted for theoretical, rather than statistical, reasons, and the actual case selected was chosen on the basis of expectations of the information content it might reveal (Flyvbjerg, 2001, p. 79). This form of purposeful sampling provided an opportunity to learn.

KPMG - a large, distributed, information-intensive, multi-national company - was a possible site for data collection and invited to participate. It was particularly attractive because it had been acknowledged externally as a site of good practice in information management and knowledge management. This reputation was built by various means¹:

¹ Others have further disseminated the "evidence" of good practice through secondary citing of material listed (for example, Huysman & De Wit, 2002, p. 89).

1. company public relations efforts had resulted in trade press coverage of its knowledge management initiatives (for example, Barker, 1999; Black, 1998, June 4; *How Big 5 consulting firms use intranets*, 2000);
2. high-profile researchers had written up case studies drawing on knowledge of information and knowledge management in the firm (for example, Eccles & Gladstone, 1995);
3. individual named employees had made substantial contributions on information management and knowledge management in the professional literature (for example, Deruchie, 1992);
4. key UK knowledge management personnel had promoted KPMG's approach to knowledge management through presentations to external audiences (for example, Goody, 1999);
5. the professional press had reported the presentations by key UK knowledge management personnel (for example, Hyams, 1999).

The standing of KPMG UK's knowledge management implementation as a model of good practice was also influenced by the regard in which a key member of knowledge management staff was held. At the time that this research was conducted, Melanie Goody was KPMG's Director of UK Knowledge Management Operations. Her high profile as a knowledge management practitioner has been developed through numerous professional contributions. These included, for example:

- efforts at developing knowledge management policy at a national level, for instance, through membership of the Chartered Institute of Library and Information Professionals policy group to target the knowledge economy;
- serving as an external validator of degree programmes that contained significant knowledge management content;
- her willingness to allow researchers to publish material based on data gathered on the work of her group (see, for example, Mahon, Hourican & Gilchrist, 2001, pp. 137-141).

Goody has been named one of the top ten UK "keepers of knowledge" by the *Independent on Sunday* in March 2002 (Hilpern, 2002).

As well as managing its own knowledge management efforts, at the time of case study selection, KPMG was advising other companies on knowledge management as part of its portfolio of services (reported, for example, by Horne, 1998). The company also produced short reports on knowledge management. These items, such as the *Knowledge Management research report* (KPMG, 1999), are publicly available and widely cited (for example, Cabrera, 2000; Herson, 2000). The firm's interest in knowledge management (or interest in promoting its interest in knowledge management) during period that this research was conducted is evident in public relations efforts such as sponsorship of the 2000 *Human Resources Magazine* Excellence in Knowledge Management Award (UK Knowledge Management Group, 2000, October, p. 2).

It can be seen that KPMG's knowledge management programmes were known to have been devised in a particular way, and externally the firm was promoted and acknowledged as a site of "good practice" in knowledge management. To an extent, then, the firm's implementation of knowledge management was publicly regarded as an unusual case. This was considered an advantage since extreme situations are believed to be particularly useful in replicating or extending knowledge of new phenomena (Eisenhardt, 1989, p. 537; Flyvbjerg, 2001, p. 79; Locke, 2001, p. 16).

Access to data subjects can be a major issue when attempting to carry out research in the corporate setting, particularly if there is a requirement to gather data from employees in positions of power in a highly charged political environment (Locke, 2001, p. 111). In this case, however, prior personal contact with the firm's Knowledge Management Directorate greatly facilitated confirmation of access in December 1999.

3.3 The field work

The research strategy of following a grounded approach with a single case study as output was implemented through data collection in stages between December 1999 and December 2003. Initially some time was spent within the firm for purposes of acclimatisation. Preliminary literature search and review work was completed in the same period off-site. Pilot interviews were then conducted to test the suitability of the chosen approach. When preliminary analysis of the pilot interview transcripts proved the main research instrument to be effective (both in terms of generating workable data and identifying interview questions for further interviewees), this approach was scaled up for the full study. Further data collection efforts focused on a full review of documentation related to knowledge management and the development of the intranet within the firm in the UK.

Analysis of the data collected was completed in stages. Potential problems regarding continuity with the research setting were minimised by efforts to maintain e-mail contact with the firm's Knowledge Management Directorate in the periods spent off-site. Further details of each activity are developed below.

3.3.1 Literature search and review, and practitioner interest in the topic

The literature search work completed up to mid-2001 focused on identifying published material that comprised studies on knowledge sharing, with particular reference to the role of ICTs. The scope of the survey was wide. It included material that took knowledge sharing as its main focus, as well as studies that treated together the themes of knowledge sharing and ICTs, or mentioned knowledge sharing as an incidental of studies on related topics. Surveying this work resulted in the development of a preliminary literature review. This review was used to inform the primary data collection process.

On the basis of what was found in the initial review of the literature, it was established that an investigation into the role of the intranet in knowledge sharing was viable. The potential benefit

of generating results that would be of interest to both academic and practitioner communities, was a further motivation for the completion of the research. By tying observations from extant literature with the empirical data, explanations of the role of the intranet in knowledge sharing would be generated from the study. A new construct, or set of constructs could emerge from the analysis of empirical data. It would address criticisms that have been levelled at previous work that takes a similar approach, yet fails to provide genuine links between the analysis of data collected in the field and findings from the literature combined with common sense and experience (Eisenhardt, 1989, p. 532).

As has already been highlighted in the text of Chapter 2, the findings of the original literature review were found to be inconsistent. Since it was difficult to extract generalisations from the documents uncovered, these were later supplemented by a second set of material. Thus the original literature review was extended to include studies that consider why technology implementations are indeterministic. This led to a framework for the research that was more focused on organisational and social issues, and a number of additional concepts were thus introduced to the study. These included lines of work, going concerns, infrastructure, production lattices and macrostructures of the computing environment (Kling & Scacchi, 1982), the concept of the user as a social actor (Lamb & Kling, 2002), boundary objects (Star & Griesemer, 1989) and power relations in knowledge management (Eckbia & Kling, 2003). In combination with the primary data collected in the case study firm, the additional literature reviewed proved to be a useful platform for analysing the role of the intranet in knowledge sharing.

3.3.2 Data collection

For the reasons advocated by grounded theorists, a variety of data collection methods was employed in this research. The methods adopted shared some characteristics of the ethnographic approach in that they included observation, as well as a review and analysis of company documentation on knowledge management policy and the firm's UK intranet implementation. This allowed for building a retrospective account of the implementation examined. The main data collection activity centred on in-depth interviews with key informants, thus providing insight on the implementation that was deemed "current" in the fourth quarter of 2001. Context and time specific data were collected to create a picture of corporate life "in the making". Each of the data-gathering activities is discussed in further detail below.

Prior to embarking on data collection by interview some time was spent within the firm to gain an appreciation of its approach to knowledge management in general, and the UK intranet in particular, in a non-invasive manner. This was achieved through:

- (1) a series of small meetings;
- (2) a preliminary audit of company documents relating to knowledge management and intranet development;
- (3) attendance at two company conferences for UK intranet development staff.

In this period it was important to strike a reasonable balance between the benefit of gaining an understanding of the context of the organisation to be studied and the risk of contaminating the future data collection exercises.

Meetings were held with members of the firm's Knowledge Management Directorate in December 1999, May 2000 and September 2000. Here, contextual information was provided on the history of knowledge management initiatives and intranet development in the UK, and on favoured approaches to knowledge management, within the firm. At these meetings it was established that means of facilitating knowledge sharing was an area of interest shared by members of the Knowledge Management Directorate. Practical information on issues such as staffing, business cycles and geographic responsibilities supplied on these three occasions proved helpful in formulating plans for later data collection in terms of sample selection, and the timing and location of the interviews with key informants. Collecting this information in this way matched the spirit of theoretical sampling in that initial informants within the case study firm pointed to particular individuals as subjects for the main data collection exercise.

In January 2001, a preliminary audit of internal documentation related to knowledge management policy and the development of the intranet in the UK was conducted. The material examined mainly comprised minutes of the monthly meetings of the committee charged with managing the development of the UK portion of the corporate intranet. (Further details of the firm's committee structures related to knowledge management and the intranet are given in Chapter 5.) Internal reports and best practice guides related to intranet development were also consulted. Additional documentary material was made available for examination in the form of presentations prepared by the Knowledge Management Directorate for external dissemination.

Following the audit work in January 2001, in March the same year an invitation to an in-house conference for intranet development staff was accepted. Attendance at the follow-up conference in October 2001 was also facilitated. These conferences provided the opportunity to hear about current and planned knowledge management and intranet initiatives within the firm. It was possible to interact informally with knowledge management and intranet development staff, some of whom were later interviewed as part of the main data collection exercise and were thus observed more than once (Miles & Huberman, 1994, p. 38).

The decision to interview data subjects was based on the premise that the research was best served by collecting detailed data from a few respondents willing to talk about knowledge management issues in depth. Interviewing these people face-to-face allowed the opportunity to verify responses and follow up interview comments on the spot. Answers were qualified through direct questioning. Complex information was collected with a low risk of the issue under enquiry being misunderstood (as can be the case with questionnaire surveys). The response rate to questioning was 100% since the interviewer was in control of the data collection schedule, rather than, for example, relying on sample members to return a questionnaire by e-mail or post. Face-to-face interviews at the invitation of the case study organisation, and supported by the

Knowledge Management Directorate, generated useable data for analysis as interpretative social research based on the collected perceptions of the participants' working environment.

The decision was taken to seek primary data from the "official" agents of knowledge exchange in the firm, i.e. those in designated knowledge management roles distributed across the firm's business units. They operated as mediators and facilitators of knowledge exchange by managing the connection between the information needs of the business and the system that supported these needs, and by identifying further opportunities provided by the web environment. This tier of staff was important as the embodiment of the firm's knowledge management strategy and its implementation.

Consideration was also given to interviewing end-users as knowledge sharers. This might have produced useful data on their perceptions related to knowledge sharing and the intranet, and provided points of reference to what was being said by the firm's official agents of knowledge exchange. However, data generated from this group would have changed the nature of the study. There was also a degree of reluctance within the firm to provide access to end-users, not least because this would be difficult to arrange since many worked on the basis of "charged out" time. In the period scheduled for the main data collection exercise (October-December 2001) fifteen individuals held the post of Knowledge Manager in the case study firm in the UK. One further post was vacant. Arrangements were made for all the Knowledge Managers in post to be interviewed individually. Given that the focus of the research was the role of the intranet in knowledge sharing it was also appropriate to interview senior representatives of the intranet development community, known as Presence Producers, along with the Knowledge Managers. In the main data collection period (October-December 2001) there were approximately 140 UK staff engaged part-time or full-time in the design, structure and navigation of intranet content. Their work also included preparing files supplied by colleagues and then loading them up to the intranet. Of these, six senior Presence Producers with full-time intranet responsibilities were interviewed.

It was anticipated that Knowledge Managers would have more to say about strategic issues related to connecting systems with user needs than Presence Producers whose daily work was concerned with manipulating content provided by others into a suitable format for further exploitation. The sample represented all but one² of the firm's major business units (known as functions and lines of business or markets), and two of its infrastructure groups. By the end of this exercise all but one of the UK Knowledge Managers in post had been interviewed³, as well as the six senior staff working in Presence Producer roles. Constant comparison of interview transcript to interview transcript from the small sample produced results with internal validity.

The interviews were held in meeting rooms of the firm's UK offices. The majority of interviews lasted for approximately one hour. A few were longer. It was seen as worthwhile and polite to

² The missing unit is the one where there was the vacancy.

³ One Knowledge Manager was unable to attend for interview due to work commitments.

guarantee that individual interviewees would not be named in the output from the data collection exercise. It was also explained that the research, and the dissemination of its results, was subject to a confidentiality agreement between the firm and the researcher plus supervision/examination team, and that it was an academic study rather than a consultancy exercise. These reassurances minimised “observer effect” (Denscombe, 1998, p. 41).

All interviewees spoke openly, some revealing that they welcomed the chance to discuss their work frankly. To an extent they used the interview as a confessional, confirming the view that “people tend to enjoy the rather rare chance to talk about their ideas at length to a person whose purpose is to listen and note the ideas without being critical” (Denscombe, 1998, p. 136). In all but one case the interviewees came across as highly articulate. They often presented detailed examples and anecdotes to substantiate their opinions and perceptions, thus providing rich description for generating grounded explanation.

The first five interviews conducted in the week beginning 1 October 2001 were treated as pilots. Their function was to test the suitability of the questions prepared in the interview schedule and the validity of the proposed research instrument as a whole. Three pilot interviewees spoke freely and at length. They covered many of the main issues, and introduced new themes, with little acknowledgement of the interview schedule. This approach had the benefit of the interviewees revealing their priorities without prompting. One disadvantage, however, was the tendency for the interviewees to wander off-topic (according to the prepared schedule) and some data apparently irrelevant to the research (at least at this point) were collected. The other two interviews were conducted with closer reference to the prepared statements and questions. The data collected from these two individuals articulated more closely with the anticipated outcome of the interview schedule. These interviewees also highlighted the issues that concerned them most, and hinted at other factors that they believed to encourage or inhibit knowledge sharing with particular reference to the use of the intranet as part of the firm's knowledge management implementation.

Prior to the start of the main data collection exercise it was anticipated that the main research question and possible constructs were likely to shift during the research process. This is typical in this kind of work (Eisenhardt, 1989, p. 536) and legitimate practice in qualitative research (Easterby-Smith et al., 2002, p. 83). In the event, the interview schedule evolved in three further stages in “snowball fashion” as new issues emerged in the growing sample of interviewees. For example, prior to the interviews held in December 2001, processing of interview data collected in October and November 2001 revealed that there were gaps in the data about the firm's appraisal system as providing rewards for knowledge sharing, and on the operation of communities. It was also felt that it was worth asking the last set of interviewees to comment on a diagrammatic representation of knowledge exchange. The opportunity to cover these three issues was taken in editing the third version of the interview schedule. Thus, to a certain extent, data analysis and data collection work overlapped as advantage was taken of emerging issues. This “controlled opportunism” (Eisenhardt, 1989, p. 539) was legitimate since the goal was to

understand the case in as much detail as possible to enhance the likelihood of gathering data that would furnish insight for generating grounded explanation.

No significant new issues emerged from the final five interviews conducted in the week beginning 3 December 2001. There was a strong degree of stability in the data by this time: the same points were being repeated over and over. It was therefore concluded that saturation had been reached since further analysis would not contribute anything further to the study (Strauss, 1987, p. 21). The interviews with the distributed knowledge management staff were completed on 13 December 2001 in one of the firm's regional offices.

The coding and analysis processes were executed following established methods for data fracture, manipulation and reorder (as outlined, for example, by Easterby-Smith et al., 2002, pp. 123-125, and Fielding, 2001). The provisional codes and categories based on the first five sets of interview data were handled manually. They formed the basis for the full coding exercise executed on the prepared transcripts loaded into The Ethnograph, a qualitative data analysis package.

Since the aim of the work was to answer certain questions (primarily on the intranet and knowledge sharing), throughout the process the categories for coding were derived primarily from the data collected, rather than imposed from the findings of the literature review. The categories were thus "coded up" (Fielding, 2001, p. 236) in the main, as advocated by the grounded approach. Empirical observation led to the definition of concepts and, ultimately, the relationships between these concepts. (Had the reverse been the case it is likely that much would have been excluded from the actual findings.) In effect, the scaffold of the codes permitted structured explanation of what was found in the data. The relationships made evident through the coding allowed for "deep" connections to be identified.

Categories of themes that constituted the concerns and interests of the interviewees, with relation to knowledge sharing, were first constructed from the data gathered in the five pilot interviews in October 2001. Additional data were then gathered in the subsequent interviews to permit amendment (modification, addition and deletion) and integration of the categories. For example, codes had to be altered and developed to take into account: different understandings of what "sharing" meant to knowledge management staff; individual distinctions between the terms "knowledge management" and "information management"; and articulated ideas on the operation of multiple information/knowledge economies within the firm. Refinement of the codes and categories to reflect emerging insights led to the creation of further categories to explain the results. Throughout the process there was evident tension between employing codes that were specific enough to match the data collected and broad enough to produce explanations that were generalisable.

The practices of data coding and data analysis for this work cannot be viewed as separate activities: the two were executed in tandem with each process informing the other. The act of identifying code categories in itself provided the opportunity for research insight. Breaking the

content of the transcripts into separate data incident fragments was useful in that it imposed a form of distance between *what was expressed by interviewees* and the interview transcripts as the *containers* of what was said. The act of naming and renaming concepts and assigning the codes to incidents in the data, both within and across transcriptions, eventually contributed to the generation of better understanding of the content of the interviews. Relationships identified between data marked the starting point for building explanations: attempts were made to understand the reasons for such relationships. Throughout the coding and analysis period notes of emerging insights were also kept as memos for future reference. In addition, discussions of progress on coding with the supervisory team contributed to the efforts in data analysis. In combination the approaches described here encouraged the development of conceptualisations, which transcended the context of a set of transcripts generated by individual interviews.

In November 2002 a further data collection exercise was initiated to supplement the body of data already assembled in the audit stage made in January 2001. It had always been the intention to conduct such an exercise for triangulating the interview data. However, by this stage it became evident that a comprehensive review of company documentation, as well as further interviews with staff in the Knowledge Management Directorate, were also necessary to investigate further a theme that was emerging from the coding of the interview data: power issues. The review of company documentation facilitated the building of a historical reconstruction of the firm's knowledge management implementation from which details for Chapter 5 were extracted and analysed.

A form of "historical snowballing" (McLoughlin, 1999, p. 93) was employed in gathering information from documents held on the "public" pages of the company intranet and "private" archives of employees. Several hundred documents were examined to piece together the history of the knowledge management implementation at KPMG in the UK. Of interest was material related to UK knowledge management and intranet policy development and implementation produced up until December 2001, i.e. the point at which the interviews with the distributed Knowledge Managers and Senior Presence Producers were concluded. This material ranged from externally published reports that declared the success of KPMG's knowledge management implementation, to internal meeting minutes that suggested alternative "realities".

Certain sets of documentation were found to be particularly rich in data. These were private minutes of the committee charged with developing UK intranet policy - the KWorld/UKnow⁴ Editorial Panel (also known as the UEP) - and three sets of files produced by the centralised UK Knowledge Management Group (KMG), publicly available to KPMG employees on the company intranet. These were:

- (1) minutes of the monthly meetings of the Knowledge Managers;

⁴ KWorld is the name of the firm's global intranet; UKnow is the name of the UK national intranet.

- (2) monthly reports on intranet usage summarised in detailed PowerPoint presentations. These were useful in tracking stages in intranet implementation;
- (3) KMG's monthly newsletter, kmnews@kpmg.

Since the documents contributed to the delivery of the intranet they can be regarded as an element of its infrastructure (Kling & Scacchi, 1982, p. 18), as outlined in Chapter 2.

The sets of minutes mainly comprise summaries of reports made at meetings and records of discussions and related actions. Figure 1 and Figure 2 show an example of a minute from a UEP meeting and one from the monthly Knowledge Manager meetings. It can be seen that although these reports are relatively informal and composed largely in note form, the information content is dense.

Figure 1: Discussion summary from UEP minutes

Draft KM/ICT Working Paper – it appeared that some projects may be moving forward but position remains unclear. Still appears to be a logjam (see UEP file note 0601.doc). Jania stated that KNews had been given a budget of £50k (Helen Tregonning confirmed). LD highlighted that there appeared to be a disconnect with departments and budgets. ICT's project prioritisation is unclear and it is recognised that they need adequate funds for the projects – the position could therefore worsen as LD stated that, from a Leadership perspective, discretionary spending is being strongly challenged. LD suggest that there is a need to lobby the right person(s) within the business and that WP discuss budgetary requirements with Leadership. WP was asked to circulate the draft note to Bryan/Sam and others – and it was hoped that this would strengthen ICT/KMG's hand in securing appropriate budgets and help clarify priorities. NW also noted that in ICT a "Boutique" approach is being adopted for projects – Under 30 days & Under 30k – and this should help move forward faster.

Action – WP to send KM/ICT paper on lack of progress to Sam, Bryan and others.

(Source: KWorld/UKnow editorial panel, 2001, April 25.)

Figure 2: News report and discussion summary from Knowledge Manager meeting

2.	KM Training Plan – How to get the plan to work
2.1	Ailsa Cundy explained the background of the current Desktop Tools support (i.e. phone and 1-1 support).
2.2	It was noted that regular Desktop Tools courses will be run in the near future to get everyone involved.
2.3	A Training Plan spreadsheet was handed out to all the attendees.
2.4	Ailsa Cundy outlined the progress to date. The focus is on the following: <ul style="list-style-type: none"> - Promotion - KNews articles - E-mails - Training Website (to include support material etc.) - Following up contacts that staff have provided
2.5	It was noted that dates have been set up for future courses.
2.6	AC explained that an electronic Calendar on Outlook had been setup. If you need to gain access please inform Ailsa Cundy or Virginia Lewis. (AC/VL)
2.7	The initial target audience will be client facing staff, Secretarial/administration and Support staff.
2.8	A questionnaire is to be constructed to highlight expertise. AC to scope who the questionnaire will be sent out to.
2.10	It was noted that the theme of the Career Fair will be Knowledge Management.

(Source: UK Knowledge Management Group, 2001, April 19.)

The majority of archived documents on knowledge management in the UK, and on the national intranet, dated from 1998, the point at which KMG was formalised into the shape it held in 2001. Background information on knowledge management and intranet activity for the period up to 1998, and for which there was less hard evidence in the archive, was gathered by interview on 7 November 2002 with Goody, the Director of UK Knowledge Management Operations. A further meeting with Goody and Simpson (the UK Intranet Manager 1998-2001) held on 16 June 2003 provided additional information.

Data from these sources revealed the development of *stated* corporate knowledge management and intranet policies and protocols. It was possible to consider how they articulated with the findings from the interviews, especially with relation to the themes of power and status. The documents, supplemented with interview data derived from members of the Knowledge Management Directorate, were thus used to “provide background information as a platform for {the} research project” (Denscombe, 1998, p. 159), and to “corroborate and augment evidence from other sources” (Yin, 1994, p. 81). Together they comprised a data source in its own right (Denscombe, 1998, p. 159). A further interview was conducted with Goody in December 2003 to

gather summary information on the agents of the implementation post-2001. This is presented as a coda to Chapter 7.

For the review of company documentation, unrestricted access was granted to the archives held on the firm's intranet, as well as to material from private files. The latter included meeting notes taken by individuals and copies of presentations on knowledge management and UK intranet development delivered by KPMG staff to external audiences. Most of the archive files were located in the knowledge management repository held on the firm's intranet. Of several hundred individual documents examined for relevant information, seventy-six are cited as references in this thesis report.

That the originators of the documents to be reviewed would not have anticipated future scrutiny of their work for academic research purposes was both a drawback and an advantage to the study. For example, identifying documents that *might* have held important insights was extremely labour intensive. However, the time spent doing this was worthwhile for the advantages that this source of data held over the interview data gathered from the distributed knowledge management staff. These advantages relate to the fact that the documents examined were originally created to serve the interests of the firm, rather than the convenience of the researcher. This gave a greater impression of authenticity and credibility of the source: the documents reflected the interests and values of the groups responsible for their creation. They overcame the "subjectivity" of the interview process. In effect, these documents were artefacts of the community being studied, and in examining them their potential was realised as a source of rich data (Silverman, 1993, p. 89). Nevertheless, it was still recognised that the documents reviewed, like the interview data, were socially produced: only what had been recorded, kept and made available for scrutiny was included in the study. For this reason the derivation of material examined is provided in the text. Equally, as "social products" their objectivity could not be guaranteed. It should also be noted that the status of the evidence collected to generate the discourse in Chapter 5 varied. It ranged from official statements of corporate intent (data from the archived documents) to third hand accounts of early developments presented in the form of oral history (interview data from members of the Knowledge Management Directorate).

Denscombe (1998) also cautions that "companies may have secret strategic plans regarded as too sensitive for even a *bona fide* researcher" (p. 166) and will therefore restrict access to certain documents. During the course of this research it was felt that the only restriction on access was to people, and that was on the basis of their availability. There did not *appear* to be any restrictions on access to documentation. Indeed, several contacts at the firm made special efforts to meet requests for material, often anticipating unarticulated needs or generously supplying extra material that was not really required. (It could be concluded that the good relations between the parties involved in the research, and the two-year embargo on the dissemination of results, contributed towards this.)

The data gathered from the company documentation and interviews with Goody and Simpson was coded manually. The data was sorted by five main themes:

- (1) knowledge management at the firm;
- (2) intranet development stages;
- (3) the role of the centralised Knowledge Management Group;
- (4) the role of Knowledge Managers and Presence Producers distributed in units across the business;
- (5) policy on knowledge sharing.

The content of the documents was analysed in detail, but it would be an exaggeration to say that the process was one of “content analysis” in the strictest sense of the term (as described, for example, by Denscombe, 1998, pp. 167-168). In practice, sub-categories of each main theme were created and the material extracted into notes presented in date order with the sub-categories highlighted so that the data could initially be recomposed as a historical narrative. Details from the narrative relevant to the main themes of this research were then extracted to create the content of Chapter 5. Throughout the process, the data was treated with caution so that a critical interpretation would be made. This was especially important when handling material that formed the basis of presentations made by firm representatives to external audiences.

3.4 Social analysis of the findings

The critique of KPMG’s UK knowledge management implementation, as will be seen in the chapters which follow, fits with the existing evidence of attempts to build systems that have met with lower than anticipated levels of success. In such cases organisations consistently fail to recognise the challenge of implementing new technologies, and the associated level of resource required for development (Williams, 1997, p. 12). There “is much documented evidence of how firms tend to underestimate the nature and scale of {integrating new artefacts into existing operations and production processes} with the result that machinery and artefacts are either abandoned or never fully utilized” (Fleck & Howells, 2001, p. 528).

On the basis of material drawn from both the interview data and documents held in the KPMG archive, it is possible to account generally for the observations on the knowledge management implementation, and to assess them with reference to conflicting and similar literature, as advised by Eisenhardt (1989). The danger in this kind of assessment, however, is that it is tempting to limit the focus to more visible aspects in isolation, in this case, the intranet:

There is a common tendency to privilege the artefactual component of a technology, to see the artefactual component as more important than, or separable from the specific social context that must also be part of a technology.

(Fleck & Howells, 2001, p. 526.)

An alternative means of furnishing explanation adopted for this research was to consider significant episodes in the “life” of the implementation in the form of a social analysis, where people and technologies are viewed as a linked network of social actors (Lamb & Kling, 2002, para 82). Such analyses recognise that any implementation is a consequence of social choice and the negotiations played out by diverse parties involved in the network. The features of the implementation are considered as emergent properties of the interaction between *technology* and *organisational context*. Another argument for presenting this social analysis of the evidence presented is that the core of this research was an investigation of knowledge sharing, in itself a social process.

The deployment of actor-network theory, also known as the sociology of translation (Law, 1992, para 2), provided an appropriate means of generating explanations based on a social analysis. Actor-network theory is a relatively new theoretical perspective (Ritzer, 2003, p. 224 and p. 594; Ritzer & Smart, 2001, p. 4), and described as a “relational and process-oriented sociology that treats agents, organisations, and devices as interactive effects” (Law, 1992, para 36). It was developed largely through the work of Callon and Latour in the 1980s (for example, Callon, 1986; Callon & Latour, 1981), and has found applications in numerous areas of study. Conscious of the purpose, methods and limitations of the approach, the research into the intranet and knowledge management implementation at KPMG, as discussed in this thesis, illuminates the interactions of the enmeshed multiple actors through the deployment of actor-network theory.

Actor-network theory was particularly attractive as a tool of analysis for a number of reasons. First, actor-network theory is used extensively in research which attempts to record how macro-objects come into being (Barnes, 2001, p. 343): this research is largely concerned with an intranet implementation, i.e. a technology that can be considered a macro-object. Second, there are precedents for actor-network theory to be used in the context of the study of technologies (Lamb & Kling, 2002, para 84; Law, 2000). These studies embrace the approach enthusiastically. For example, Lamb and Kling (2002) maintain that the concepts of actor-network theory “provide a powerful lens through which to view the social actor and her interactions through ICTs” (para 83). They invite the information systems community to deploy actor-network theory on the grounds that it is theoretically sound (para 85) and can “sharpen perceptions of how organizational contexts shape ICT-related practices, and... help researchers more accurately portray the complex and multiple roles that people fulfill while adopting, adapting and using information systems” (para 2). Lamb and Kling’s (2002) study is particularly persuasive in the context of research into the intranet’s role in knowledge sharing since they explain that they found it “a helpful guide for data collection and analysis” for understanding intranet integration in their own work (para 88). It has also been argued that actor-network theory can be used to explain the operations and the emergence of calculating agents in a market (Callon, 1999): a knowledge-sharing environment can be presented as a market, as has been shown in Chapter 2.

Thus, the discussion of the research findings takes into account the differing agendas that contributed to the development of the intranet within the context of the knowledge management implementation at KPMG, with reference to both micro and macro-level activity. In this, actor-network theory is employed both as a method and as a means of explanation, as advocated by Latour (1999, pp. 20-21). It recognises the relative positions of researcher and subjects of research:

Actors know what they do and we have to learn from them not only what they do, but how and why they do it. It is *us*, the social scientists, who lack knowledge of what they do, and not *they* who are missing the explanation of why they are unwittingly manipulated by forces exterior to themselves and known to the social scientists' powerful gaze and methods.

(Latour, 1999, p. 19.)

In this approach the "innovation is understood as a process of changing networks of social and technical relations – identities, expectations, beliefs, values, machines, material resources etc." (McLoughlin, 1999, p. 94). The political nature of context-dependent choices and compromises that contributed to the firm's innovative implementations is recognised (McLoughlin, 1999, p. 101; Williams, 2000, p. 258). As well as exposing the social basis of the implementation (McLoughlin, 1999, p. 100), where shifting and unpredictable alliances determine action, the analysis deploys actor-network theory to explain unintended outcomes of earlier decisions. It has been possible to do this even in cases when the key players themselves did not recognise the cause and effect of their previous actions (Williams, 2000, p. 259). Links and nodes in the network are also revealed, thus bringing to the fore the infrastructure against which decisions on the knowledge management implementation were made, and conflicts of interest of actors as calculating agents resolved.

Three episodes in the history of the UK knowledge management implementation at KPMG emerged as meriting analysis from an actor-network perspective. These are shown in Table 3 and discussed further in Chapter 6. In addition, the state of the firm's global intranet (KWorld) in late 2001 warranted consideration as a footnote to the main analysis of UK knowledge management and intranet developments.

Table 3: Significant episodes in the actor-network

Episode	Outcome	Time period
1	UK intranet adoption	1995-1996
2	Establishment of KMG and distributed knowledge management staff roles	1998
3	Disillusion with the UK knowledge management implementation	2001

In constructing the analysis of each episode, attention was paid to evidence of changes in the characteristics and composition of the actor-network, such as:

- *The linking of the actors to form the network in an environment of competing interests* (including other networks).
- *The power of established members to convince others of the benefits of joining the network.* This was achieved through the processes of "translation" (Lamb & Kling, 2002, para 83; Stalder, 1997, p. 9) where common definitions and meanings were agreed, and

“problematisation” where persuasive scenarios were constructed (McLoughlin, 1999, p.95). The expectation of new recruits was that co-option would lead to the achievement of personal and collective goals. Recruitment was important since the strength of the actor-network and future potential grows with the buy-in and commitment of a large and diverse membership base (Williams, 2000, p. 252).

- *The collective consistency of actors’ behaviour on which the longevity of the actor-network depends* (McLoughlin, 1999, p. 96). This includes the modification of individual actor strategies, or simplification of interests, for the sake of the actor-network. It is observed in the form of actors ceding control by making political trade-offs, compromises and allowing their original plans to be diluted.
- *The degree of stability in the network*. A network can be destabilised when the power of other networks to which members belong increases, or when there is a decrease in members’ willingness to make compromises.

For the purposes of this analysis individual people (for example, Goody as Director of UK Knowledge Management Operations), individual artefacts and concepts (for example, the UK intranet, policy documents and knowledge management) and groups of individuals (for example, distributed knowledge management staff) were classed as the actors in the main network that supported the development of the UK knowledge management implementation at KPMG.

The primary data collected related to actor activity is framed in Chapters 4 and 5 according to the conceptual elements of Kling and Scacchi’s web model, as explained in Chapter 2. Thus Chapter 4 examines *lines of work*, *going concerns* and *production lattices* within KPMG in 2001 on the basis of data collected from the interviews with the Knowledge Managers and Presence producers. Chapter 5 then considers the *infrastructure* of KPMG’s UK intranet, and the *macrostructures*, which influenced its deployment in the period 1995-2001, through the evidence found in the company documentation and data from interviews held with members of the Knowledge Management Directorate. This material is then reframed to provide a narrative of the main episodes in the life-span of the knowledge management implementation actor-network, and analysed further to provide a picture of the role of the intranet in knowledge sharing in Chapter 6.

3.5 Conclusion to Chapter 3

The methods described in this chapter allowed for this research to investigate the role of an intranet in knowledge sharing within a large, distributed organisation. Two converging sets of data were collected and are presented according to the elements of Kling and Scacchi’s web model (1982): (1) interview data from the distributed knowledge management staff and (2) the archive of company documentation in combination with interview data from discussions with the Knowledge Management Directorate. This provided the opportunity to present a time-specific snapshot of activity and perceptions of the role of the intranet in knowledge sharing through the eyes of those charged with managing its implementation, and set it against the context of organisational goals related to knowledge management. The deployment of actor-network

theory as a method of social analysis of the research findings serves to explain the interactions between both the human and non-human actors, as well as the outcomes of this activity, within the corporate environment. It thus illuminates the significant factors that determined the development of the UK intranet within the knowledge management implementation at KPMG from 1995 onwards, and the key concerns as identified by those whose work was largely tied to the intranet and knowledge sharing within the firm in late 2001.

The following chapters aim to provide evidence of “groundedness” of the work, to show its contribution in the areas of interest and, to demonstrate good practice in the way that the results were generated. As is the case with all research of this nature, its worth is subject to scrutiny:

The value of the case study will depend on the validity claims which researchers can place on their study, and the status these claims obtain in dialogue with other validity claims in the discourse to which the study is a contribution, both in the scientific discipline concerned and, possibly, in the public sphere.

(Flyvbjerg, 2001, p. 81.)