Chapter 4

Methodology

"Case study research holds a long, distinguished history across many disciplines." (Creswell, 1998, p 62)

Introduction

Having established the background literature framing this thesis, it is important to consider the methodology employed to collect the necessary data for analysis. The methodology used in this thesis was that of a comparative case study. Creswell defines a case study as "an exploration of a 'bounded system' or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context" (1998, p 61). Obviously, the 'case' being studied is the technological diffusion of retail LBS, while the context of the case involves the socio-political settings of the US and Germany, so that this is a comparative case study. Two Western societies, similar enough in economic status to allow for the potential diffusion of such an advanced technology while also different enough in societal context to be able to draw significant conclusions, were chosen. Germany, one of the European Union's strongest economic powers, is an advanced industrial society (Sternberg and Krymalowski, 2002) as well as a nation with strict privacy regulations concerning personal data (White, 1997), and was therefore deemed appropriate for this case study. The United States, while similarly strong in economic status and technological advancement, takes a more lenient stance on the privacy of personal information and is therefore an interesting counterpart in this comparative case study.

Creswell argues that multiple data sources should be used to effectively generate a case study (Creswell, 1998, p 62). For example, he proposes that a thorough case study would employ numerous techniques of data acquisition – e.g., observations, interviews, documents, and audio-visual material (Creswell, 1998, p 62). Therefore, through the analysis of secondary source statistical data, and of US and German policy documents, and by conducting interviews and surveys with individuals involved in LBS technological development, the construction of a comprehensive description of this case became possible. Both US and German societal contexts have been analyzed using the methods of data collection discussed in turn below.

Statistical Data

Statistical data has been used in this work to allow comparison of mobile phone proliferation rates in the US and Germany. Mobile phones are regarded as the primary vector of diffusion of retail LBS due to their proliferation in the US and Germany (cellular-news, 2003; Needleman *et al.*, 2003), as well as the fact that its technology easily lends itself to LBS applications (FCC, 2003b; Foley, 2003; Needleman *et al.*, 2003). Evidence for the rapid diffusion of mobile phones is provided by data from three different economic research organizations: Organization of Economic Co-operation and Development (OECD) telecommunications data (OECD, 2003b), the Cellular Telecommunications and Internet Association (CTIA, 2003b), and data from the Research Room (The Research Room, 2003c).

The growth and diffusion of mobile phones provides evidence that the vectors necessary for retail LBS diffusion in fact exist. Everything else being equal, determining the *number* of vectors, or mobile phones, in the US and Germany demonstrates which country is more or less likely to embrace the diffusion of retail LBS. However, the number of vectors is not the only context-specific element influencing the diffusion of retail LBS. The potential *barriers* or *promoters* to the diffusion of retail LBS, including privacy policies, must also be analyzed.

Policy Study

In addition to statistical data, a thorough investigation of US, EU, and German privacy policy documents was conducted. Broadly-based works, such as the *Privacy Handbook* (Marcella and Stucki, 2003) and *e-Commerce Law* (Bagby, 2003) provided guidance for this regulatory archival research and assisted in deciding which laws should be examined in more detail. These overview documents helped contextualize individual laws within the broader framework of the US and European Union (EU) regulatory environments.

After narrowing the focus of regulations, key word searching and document coding methods (Crang, 1997; Creswell, 1998) were used to identify those documents specifically mentioning rights of personal information and privacy. A large collection of US laws (both historical and contemporary) were explored through the online search

engine, LexisNexis Academic Universe. A key word search using terms such as "privacy" and "telecommunications" was conducted to uncover US regulations potentially pertinent to retail LBS.

Archival records relating to privacy policies within the EU and Germany were obtained from various official government Web sites. As Germany is an EU member, it was necessary to first find the overarching EU privacy laws affecting members before examining laws specific to Germany. The European Commission (EC) Web site [http://europa.eu.int/comm/index_en.htm] accessed through EUROPA, the EU's official portal Web site, was used to determine which laws pertained to the potential diffusion of retail LBS. The EC is the official "driving force in the EU's institutional system" (European Commission, 2004) and administers and implements policies. A keyword search was performed to retrieve EC directives relevant to retail LBS. A keyword search was conducted using words such as "privacy," "personal information," "location-based services," and "wireless." In addition, the European Parliament Web site [http://www.europarl.eu.int], also accessed through the EUROPA portal, was used to retrieve the Charter of Fundamental Rights of the European Union (European Parliament, 2001).

In determining laws and regulations pertaining only to Germany, the *Deutscher Bundestag*, or German Parliament, Web site [http://www.bundestag.de/] and the European Foundation Web site, accessed via EUROPA [http://www.eurofound.eu.int/], were searched. Both sites offered German-specific documentation concerning privacy rights. The *Deutscher Bundestag* site is the official Web site of the German Parliament and contains a list of legal principles for the nation (Deutscher Bundestag, 2004), including links to the German Constitution (Deutscher Bundestag, 1949). Other German-specific legal information was retrieved through the European Foundation. The European Foundation is "a tripartite European Union body set up in 1975 to contribute to the planning and establishment of better living and working conditions" (European Foundation, 2004b). The site contains a searchable database called EMIRE, which includes the European Employment and Industrial Relations Glossaries explaining national industrial relations systems of certain EU member states, (European Foundation,

2004a). In this database, Germany's law regarding an individual's right to self-determination over personal data was found (European Foundation, 2004c).

From these diverse documentary sources a picture is drawn in Chapter 6 of the political regulations that may act as barriers to or promoters of the diffusion of retail LBS. This research provides evidence supporting the view that societal context will impact the diffusion of retail LBS in the US and Germany.

Surveys and Interviews

A survey was originally developed and administered to obtain a sample of US and EU LBS industry opinions as to how society affects the diffusion of technologies in which privacy is involved. Personal commentary surrounding privacy issues from individuals involved in LBS firms was also obtained from these surveys. As surveys are considered beneficial in gaining insight into a sample of a population (Salant and Dillman, 1994, p 4), for this thesis the survey was the most pertinent method to gather personal opinions and commentary from those individuals working for firms directly involved in the development and implementation of LBS.

The most difficult aspect of contacting LBS-related firms was simply in finding them. Two means proved effective in distinguishing LBS-related companies from generic technology and wireless businesses. The first method of surveying was done through "drop-off surveys" (Salant and Dillman, 1994, p 43), delivered to representatives of LBS-related firms at the ESRI (Environmental Systems Research Institute, Inc.) International User Conference, which took place in July 2003 in San Diego, CA. ESRI is the major Geographic Information Systems (GIS) software company and holds the single largest GIS conference in the world (ESRI, 2004), with over 10,000 participants in 2003 (Francica, 2003). The conference is a gathering of professionals utilizing any of the many ESRI GIS software applications. Since GIS is integral to LBSs (as discussed in Chapter 2), the conference attendees included a number of firms involved in development and deployment of LBS. Research was conducted beforehand to determine which firms represented at the conference dealt with LBS. Once the list of exhibitors was narrowed down, particular attendees were sought out on the exhibition floor and personally

contacted. The research topic and reason for the survey was introduced by the surveyor and then the survey – along with an ORP[1]-approved informed consent form – was dropped off at the exhibitor's booth and collected later by the surveyor. Due to the conference's GIS theme and its essential relation to LBS, the conference and its attendees were important and highly relevant sources of information for this thesis. **Twelve** survey respondents were contacted through the ESRI International User Conference.

Other firms were contacted using an LBS company directory published in *GPS World* (Anonymous, 2002b). The article "profiles some of the leading players in [the] dynamic and evolving [LBS] market" (Anonymous, 2002b, p 20). The market data was collected by Jupiter Research and published in *GPS World* (Anonymous, 2002b). All companies listed with email addresses in the article were contacted and asked if they would consider participating in a survey. Over 50 emails were sent out. Many companies chose not to participate or did not respond at all. However, ultimately **nine** survey responses were received from firms listed in the directory.

In addition to the 12 surveys dropped off at the conference and the nine responses received from the LBS directory, responses to Question 14 of the survey (see Appendix A), "Recommendations for further contacts," also helped in finding more people to survey and interview. After contacting these recommended potential respondents, **eight** returned completed surveys.

In the end 55 LBS firms were contacted and a total of 29 surveys were returned. Many of the firms voiced excitement about the fact that research was being done in a realm that has been, thus far, largely ignored. Around a third of survey respondents were from EU member countries: four from Germany; four from Finland; and one each from Belgium, France, and the UK. Of the remaining 18 respondents, 15 were from the United States, two from Australia, and one from Canada.

[1] The Pennsylvania State University's Office for Research Protection (ORP) coordinates activities of the Social Science Institutional Review Board (IRB), which reviews human participant research involving questionnaires, surveys, interviews, focus groups, etc. The IRB is responsible for evaluating and approving, requiring modifications in, or withholding approval of research concerning human participants.

Survey responses were highly pertinent in:

- supporting information from other sources regarding technology trends;
- obtaining information about political and industry regulations concerning privacy and how they might affect retail LBS;
- gaining individual opinions concerning privacy; and
- acquiring general insight into the topic of LBS.

Survey questions (Appendix A) were developed based on the need to obtain information in answering the problem statement. The study title was clearly labeled and a brief introduction was given thanking the participants as well as defining 'retail LBS.' The specific themes addressed by the survey questions involved restrictions on the use of personal information, direct marketing, privacy concerns involved with LBSs, and factors affecting the potential diffusion of retail LBS. All but three questions were yes or no questions, hence closed questions with ordered choices. Questions such as these are less demanding for the respondent as well as being easier to code (Salant and Dillman, 1994, p 82). Due to the nature of the group receiving the surveys (businessmen and women), closed questions were developed to make the survey as simple and straight-forward as possible to elicit a high response rate.

Question number 11 was a closed question with unordered response choices. This allowed respondents to rank the importance of factors affecting the potential success of retail LBS. As these questions are considered more difficult for respondents (Salant and Dillman, 1994, p 84), only one such question was included in the survey. This question produced the most varied responses; no two respondents had the same answer.

Though primarily consisting of yes-or-no questions, space was provided underneath every question to allow for a detailed explanation of the reasoning behind a response. Twenty-six of 29 respondents chose to provide one or more explanations. These explanations were helpful in gaining an understanding of experts' personal opinions on LBS and privacy.

As mentioned earlier, the original goal of the survey was to obtain a comprehensive, portrayal of US and EU views on how notions of privacy within society affect technological diffusion. This proved to be difficult due to the time constraints of this research, and hence the goals of this study were adjusted accordingly. As a result,

surveys and interviews have taken a supportive role in reference to the arguments made drawing on the above-mentioned statistical and documentary sources. Despite the change in survey objective, the survey was successful and the responses enthusiastic. Also as a result of this change in goals, not all survey questions are discussed in detail in this thesis. The tally of responses to individual questions, however, is located in Appendix B.

In the initial recruitment email, potential respondents were given the option of completing the survey and/or conducting an interview. Three who did not complete the survey opted for an interview instead, while one completed both the survey and was interviewed. The four interviews were conducted in an unstructured, open-ended manner via the telephone. As the interviewer did not have direct access to the individuals willing to discuss this research topic, the telephone provided the best means of communication. Individual interviews are viewed as a "particularly valuable source of information" (Alasuutari, 1995, p 93) due to the assumption that through individual interviews one can determine "what people 'really' think" (Alasuutari, 1995, p 93).

Interview questions (Appendix C) were structured around the problem statement and attempted to gain a better understanding of privacy policies used by companies involved with LBS and the interviewee's opinion of the potential adoption rates of retail LBS in the US and Germany. Because it is customary that the respondent knows exactly what the purpose of the study is (Salant and Dillman, 1994, p 154), a brief introduction to the research topic and my role was provided along with the definition of retail LBS.

Each of the four interviewees communicated with me via telephone for 15-20 minutes. During that time, I attempted to steer the conversation slightly, but also allowed the individual's personal and work experience to guide the interview. Three interviewees were from the US, while one was from Germany. One of the interviewees from the US had considerable knowledge of the European LBS market and was able to speculate on the potential for retail LBS in both the US and Germany. All interviews generated insightful comments and supporting material in this thesis.

Limitations

Though content with the overall willingness and the response rate of those surveyed and interviewed, several limitations must be noted. The first obvious issue concerns the sampling method and how LBS firms were chosen. In addition, the lack of balance in interviews and surveys received from the US and Germany must be addressed, as well as the fact that only one survey response was recorded from a wireless carrier. Finally allowances must be made for the telephone interview technique, in particular concerning the completeness of remarks while communicating via the telephone.

Since LBS is such a new technology, and retail LBS is still in its infancy, the best way to sample the opinions within the sector was to find companies who have been developing and aiding in the deployment of the technology. The list in *GPS World* was comprehensive and incorporated companies from all areas contributing to LBS research, development, and services. By contacting these firms, known to be dealing with LBS, word of mouth was used to discover others. Though not as scientific in sampling as would have been desired, this method proved an effective way to contact firms involved in LBS and was quite successful, given the more limited aims of the final survey.

Another limitation to this study is the low response rate from German employees of LBS firms and wireless service providers. Partially due to time restrictions (Germany is six hours ahead of Eastern Standard Time) and an overall unwillingness to participate, only one German was interviewed. Three Germans however were willing to complete the survey at the ESRI International User Conference, in addition to one personal communication via email.

A low response rate was also observed with employees of wireless carriers, however I did attempt to contact such employees in both the US and Germany. Wireless carriers, being controllers of geographic location information for use in LBS, arguably the most valuable data needed for LBS to work efficiently, were unwilling to discuss privacy concerns with the interviewer. An employee in the public relations department for Verizon Wireless however did offer to take a look at the survey then conveyed that she would be unable to fill out the questionnaire. Another representative of T-Mobile USA also communicated to me that no information concerning this topic may be relayed

to customers at this time. Another major US wireless carrier, Sprint, never responded to an email sent to their public relations department.

Lastly, due to time limitations during telephone interviews, an argument can be made against the completeness of notes taken during the interviews. Since the interviewer was transcribing, in addition to leading the conversation, during the phone interview, some of the notes may have been incomplete, a known drawback in telephone interviewing (Creswell, 1998, p 125). However, a question was always posed at the end of the interview asking if it would be possible to contact the interviewee for follow-up questions or clarification. Interviewees always agreed, offering the opportunity for the interviewer to reconnect with the interviewee if notes were found not as extensive as necessary, although this opportunity was not taken up as notes were found to be reliable and complete.

Conclusion

The case study methods examined above form the basis for the analysis in the following two chapters. The statistical data on mobile phones, policy documents concerning privacy, as well as surveys and interviews provide for the comparison of the potential retail LBS diffusion process in the US and Germany.

Before hypothesizing about these potential promoters and barriers to retail LBS diffusion in the US and Germany, one must first establish and examine a vector for its diffusion. The most pertinent vector in retail LBS diffusion is the mobile phone. This technology and its proliferation in the US and Germany will be analyzed in Chapter 5.