Agency, Socio-Cultural Context, and the Role of the Technical Communicator during IT Adoption: A Case Study in Innovation Diffusion Across Cultures

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Abstract

This dissertation examines the diffusion of an innovative information technology system across multiple cultures between 2000 and 2006. Developed and implemented by technical communicators in the technical communication department of a global medical device company, the Advanced Single-Source Authoring and Publication System (ASAPS) brought profound changes to documentation processes and was not wholly embraced by all of the writers in a position to use it. Employing the case study method, this project explores the influence of socio-cultural context and agency on the decision to adopt the new system, as well as the role of the technical communicator as change agent during the diffusion process. The inquiry is guided by an adapted hybrid theoretical framework incorporating Rogers' Diffusion of Innovations Theory, Engeström's Cultural-Historical Activity Theory, Hofstede's Culture Dimensions, and the Cultural Studies Perspective. Using online questionnaires, the study examines the adoption decisions of technical writers and translators in the following three locations: Minnesota in the U.S.A., Gelderland and Limberg in the Netherlands. In addition, three technical communicators identified as the change agents instrumental to developing and implementing ASAPS are interviewed face-to-face.

The more notable finding concerning the role of technical communicators as change agents is that a pro-innovation bias coupled with multiple levels of culture difference can hinder the change agent's ability to engage more reluctant users in

reciprocal, adoption-conducive meaning making during innovation diffusion. This case suggests that by engaging their rhetorical agency during innovation diffusion, technical communicators can empower users to participate more fully in the adoption-decision process. One of the more notable findings concerning agency is that users can be empowered both actively and passively during the adoption-decision process, particularly when elements in the socio-cultural context open a window of agency for more silent resistance. Finally, this study suggests that national culture differences also can influence adoption decisions by demonstrating that Dutch management tends to reinforce collaborative decisions while U.S. management tends to reinforce individualized decisions.

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CHAPTER 1: Introduction

In the late 1980's, Shoshanna Zuboff wove a tale about a "historical transformation of immense proportions" (xiii) in which she illuminated a moment of change precisely at that juncture where old systems give way to the new. Already coming into their own, information technologies (or Smart Machines, as Zuboff dubbed them) were poised to eclipse the known rhythms of the workplace; and what that ultimately meant to the nature and meaning of work was only beginning to come to light at the time of Zuboff's study. In other words, just as the Industrial Age dramatically influenced how we worked and lived, the Computer (or Internet) Age was heralding equally monumental social and cultural shifts (Draves and Coates). Presciently, Zuboff captured that moment when the patterns of work inexorably shifted, making sense of its human impact at the "intimate levels of experience" (xiii). As she put it, she "found a 'window of opportunity' during which people who were working with the technology for the first time were ripe with questions and insights regarding the distinct qualities of their experience" (13). In examining the human aspect to this paradigm shift, Zuboff illuminated how innovation on such a grand and all-encompassing scale can have "transformative implications for both the contours and the interior texture of our lives" (388). Her work reminds us that society's absorption of profoundly original technologies brings both contingent and intrinsic change that affects not only social and cultural structures, but also how individuals experience and ultimately perceive their lives.

Ten years after Zuboff's iconic study, the wave of information technology change she describes began to have an irrevocable influence on the field of technical communication. Of course, technical communicators had always been at the forefront of technological advancement, not only as scribes accommodating technology to the user (Dobrin 118), but also as adopters of innovations themselves. Technical documentation grew more complex and varied in the latter half of the 20th Century, particularly as it branched into multimedia and Web-based materials, and technical writers were increasingly adapting to the latest desktop publishing and WYSIWYG[1] systems. In fact, by the end of the 1990's, content management expert Ann Rockley was claiming that technical communicators needed "a strong knowledge of tools" or they had "little opportunity for career growth" (189). While technical writers had been steadily adopting the ever-advancing tools of their trade, the advent of single-source content management technology brought a revolutionary change that promised to radically alter the technical communication field (Pullman and Gu 3). Much like Zuboff's human-based exploration of the organizational shift from an industrial model to an information technology model, there is a very human story to the profound changes that single sourcing and the management of content brought to documentation processes.

The content management systems that evolved in technical communication provide "a platform for managing the creation, review, filing, updating, distribution, and storage of structured and unstructured content [or information]" (White 20). Coupled

[1] WYSIWYG stands for 'What You See is What You Get' tools such as FrameMaker and InDesign.

with these systems is a single-source documentation method that allows for the re-use of stored information. Ament defines single sourcing as "a method for systematically re-using information [in which] you develop modular content in one source document or database, then assemble the content into different document formats for different audiences and purposes" (3). Changing information development to "stand-alone content modules that make sense in any document format or reading sequence" (Ament 5), has dramatically altered the process of authoring from a traditionally more linear model to "an iterative model, where content objects are created, reviewed, and approved out of sequence and for multiple publishing channels" (Hamer 22). The impact of this paradigm shift on intrinsic notions of authorship among technical writers was profound at the time and today is still at the center of much technical communication scholarship. At the most fundamental level, single sourcing means the writer is no longer the primary author of a product document. Rather than "ownership" of the content for an entire document, the writer participates in "joint ownership" with other content developers and may be responsible only for writing "a piece or cross-section of [what might constitute] a series of documents" (Rockley 2003, 352). Some of the ramifications of this more structured, collaborative approach to writing include fewer opportunities for "creating unique content" (Bailie 39), issues of plagiarism that can become embroiled in the re-use of content (Reyman 62), and the need for skills more in tune with the field of computer science than technical communication (Kramer 328). Indeed, the rhetorical nuances of audience and purpose often are indeterminate when writing a section of content that will

likely be used across multiple deliverables. The change, whether viewed as a positive or negative for the field, essentially "disrupt[ed] the equilibrium" (Carlson 87) of what it meant to be a technical writer. The implications of this technological change for technical writers speak to Zuboff's observation that a worker "cherish the autonomy and sense of control afforded by his or her skills" (404). When technology demands profound changes in workplace skill sets, however, individuals often "anticipate a loss of their unique identities, of freedom and autonomy, and of well-defined rights and responsibilities"(404). When the still novel technology of single-source content management had begun to be implemented in the late 1990's, then, the first writers to adopt it were facing an arc of change that threatened not only to transform the nature of their work but also their very identities as writers.

Sparked by Zuboff's work and the historic transformation that single-source systems brought to technical writing, I was inspired to examine "the texture of the human experience" (12) during that juncture of change when people were being asked to adopt a truly transformative innovation. Unlike Zuboff, I was not able to capture the moment of technological transition as it actually happened; however, I did have the good fortune to work with a group of technical communicators and translators who had been through the experience of transitioning to a single-source content management system. What makes the case of this transition to a single-source system uniquely worthy of study is that the writers and translators were adopting the system during the timeframe in the early 2000's when technical communication departments were first implementing the new technology.

In other words, the innovation was so novel there were no predecessors or established systems to inform the users' understanding of it; therefore, this case presented an opportunity to explore how people experienced adopting an innovation during that momentary, yet profound, juncture of unknown change.

The case at the center of this dissertation unfolds in a global medical device company located in the United States and the Netherlands and involves the transition to a single-source content management system called Advanced Single-Source Authoring and Publishing System or ASAPS.[2] Developed in-house by a team of technical communicators, ASAPS presented a unique opportunity to examine the nascent stages of an innovative system that would radically influence the field of technical communication. While this study might have gone in multiple, equally intriguing directions, of principle interest to me was how the eventual users first responded to the new technology and how and why their perceptions of it shifted over time. The focal point of this study, therefore, is the adoption-decision process, which encompasses the period ranging from when the study participants first became aware of the new technology to when they accepted using it in their work. Using a hybrid theoretical framework that incorporates Rogers' adoption and diffusion theory, Engeström's cultural-historical activity theory, and Hofstede's culture dimensions, I specifically explore the influence of socio-cultural context and agency on people's responses to the innovation, as well as the role of the technical communicator in implementing the transition to the new technology. Additionally, to

[2] ASAPS is a pseudonym for the name of the actual system that was developed.

better illuminate the human story, which often is masked by the technological one, I engage a cultural studies lens during my analysis.

CHAPTER 2: The Story of the Advanced Single-Source Authoring and Publishing System (ASAPS)

Why this Case

Before explaining details of the case and what generated the specific research questions that emerged for this study, I will discuss what brought me to this innovation diffusion story and how I situated it within the broader parameters of Rogers' Diffusion of Innovations theory. In 2007/2008 I was awarded a Graduate Research Fellowship with a global medical device company (GMDC) headquartered in the Upper Midwest, which gave me the opportunity to conduct industry-based research in the Technical Communication Department of the GMDC's Cardiac Care division. The fellowship sponsor, Mary Palmer, Director of Technical Communications for Cardiac Care, initiated my research project with onsite visits to corporate headquarters in Minnesota. Through the course of two visits to the Minnesota technical communication offices in early summer 2007, I learned about the work done in the department, met a number of the technical writers, and began exploring potential avenues of research. It was during this time that I met Steve Miller and first heard about the innovative single-source content management system he helped to create. Steve's story about the challenges and triumphs of developing and implementing the Advanced Single-Source Authoring and Publishing System or ASAPS, led to two intriguing observations. First, the time period when ASAPS was adopted placed it at the forefront of sweeping changes in how content is managed in the 21st Century; therefore, the ASAPS story presented an opportunity to

examine the diffusion process of a truly novel innovation. The second intriguing element of this story was that it almost exclusively involved technical communicators. Given that the paradigm shift brought about by single-sourcing has profoundly influenced the work of technical writers, the ASAPS story offered a unique situation for exploring the role of technical communicators in the innovation adoption processes.

As part of these exploratory meetings and to further understand the international reach of ASAPS, in early July 2007 I visited the GMDC technical communication offices located in the central Gelderland region of the Netherlands.[3] Once a GMDC competitor specializing in pacemaker technology, this somewhat autonomous group became a subsidiary in the mid-1980s. The sponsor of the visit, Marjo, gave me a tour of the office, introduced me to another technical writer in the department, and invited me to lunch in the company cafeteria. She also demonstrated how ASAPS worked. The visit gave me insight into the Dutch perspective on the transition to ASAPS and its impact on their work, which resulted in my broader appreciation for the cultural differences among the various locations where ASAPS had been implemented. The research potential of the ASAPS case began to take shape at this point, and when I returned to the US, I began to pursue the case study in earnest.

To better understand the impact of ASAPS on technical writing and translating functions, it was important to learn more about how the innovation worked. Steve met

[3] The visit to the Gelderland office was in conjunction with a conference I was attending further north in Groeningen. Unfortunately, the timing of my visit prevented me from visiting the translation offices in Limberg, which is much further to the south.

with me for nearly four hours one afternoon in August 2007 to explain why and how ASAPS was developed, as well as to describe the essentials of how it worked. Having already seen aspects of ASAPS 'in action' in Gelderland, I determined that for the purposes of this study, it was not necessary to learn how to actually use the system and that it was enough to simply understand how it functioned in the abstract. During this meeting, I also began collecting the names of potential study participants – both users and those who developed and implemented ASAPS. Steve introduced me to the other two technical communicators responsible for implementing ASAPS, Lisa Steepleton and Karen Nelson[4], and provided me with the names of the individuals still employed by GMDC (as of August 2007) who worked for the Cardiac Care division during the time period of ASAPS implementation. In an effort to get as thorough and diverse a sample of participants as possible, I also asked Mary Palmer for the names of individuals involved in the ASAPS implementation who might be willing to participate in the study. All of the people she suggested agreed with Steve's recommendations. By early fall 2007 I had a good understanding of the ASAPS system and a list of 12 potential study participants[5] across three locations (eight at corporate headquarters in Minnesota, two in the Gelderland subsidiary, and three in the translation offices in Limberg).

[4] Lisa, Karen, and Steve were three of four core members of the ASAPS team. The fourth member, a software developer, did not have a technical communication background and did not function in that capacity at any time during the parameters of the study. Since his responsibility was solely for the development of the system, rather than implementing it among the users, he was not included as a study participant.

[5] See Appendix A for further background information on the study participants.

Background

The global medical device company (GMDC) in which the ASAPS' story takes place is a worldwide leader in the research, development, and manufacturing of life enhancing medical technologies. Its products and services treat medical conditions ranging from diabetes to neurological disorders in nearly 5 million patients each year. Initially established as a local manufacturer of biomedical devices, by the early 2000s it had become a global medical technology leader with over 30 percent of its sales outside the US. Today, GMDC employs nearly 40,000 people in over 120 countries and exceeds $12 billion in annual revenue.

At the center of this case is the company's largest and most profitable division, Cardiac Care, which specializes in the management of cardiac rhythm disorders to improve long-term patient care. Some of the products developed in this division include pacemakers, implantable defibrillators, and implantable resynchronization devices.[6] The Technical Communication department, where most authoring of Cardiac Care production deliverables[7] takes place, is located at the organization's offices in Minnesota, USA. The other GMDC locations important to the ASAPS story are in two regions of the Netherlands: the Limberg offices, which meet most of Cardiac Care's translation and localization needs; the Gelderland offices, a specialized subsidiary of GMDC and closely

[6] The pacemakers treat bradycardia or heartbeats that are too slow, the implantable defibrillators treat tachyarrhythmia or heartbeats that are too fast, and implantable resynchronization devices improve cardiac blood-pumping ability for patients with heart failure.
[7] Deliverables are all documentation for healthcare professionals and patients.

aligned with Cardiac Care, where the technical writing is primarily focused on pacemaker technologies.

While GMDC prospered during the rapid globalization of business in the latter half of the 20th Century, the path to success was not without challenges, particularly for the Technical Communication Department of the Cardiac Care division. Profound changes in the 1990s in Europe (a critical market for GMDC)[8] had striking ramifications for authoring and translation processes. The creation of the European Union (EU)[9], which consolidated the participating countries of Europe into a single market with a common currency, the Euro,[10] and cooperative policies in trade, foreign defense, and judicial and internal affairs (Central Intelligence Agency), presented GMDC with new regulatory challenges that were particularly daunting for documentation production. Before any medical technology could be freely marketed within the EU, it was required to bear the standard CE Marking[11] signifying that the product met essential safety and performance requirements (Siebert, et. al. 735) and that the manufacturer of the product had not been subjected to additional, individual member state requirements (Dati 1293). One provision essential for earning this mark of approval was Article 4 of the 1993

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[8] As of 2006, European sales accounted for 20 percent of GMDC's overall worldwide sales (citation omitted to maintain anonymity of the company).

[9] The European Union was formally established with the 1992 Treaty of Maastricht and consisted of these participating nations: Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Denmark, Ireland, United Kingdom, Greece, Spain, and Portugal.

[10] According to 2008 figures, the EU is the largest economic entity in the world, ranking first in Gross Domestic Product (GDP) which is the value of all final goods and services produced within a nation in a given year. (Central Intelligence Agency).

[11] CE officially stands for *Conformité Européen.*or European Conformity.

Directive (93/42/EEC) [12] requiring all user and patient information “to be in their national language(s) or in another Community language, when a device reaches the final user, regardless of whether it is for professional or other use." (Pilot, par. 10). In other words, the unification of Europe meant that GMDC now had to accommodate the national language of every European country where its products were sold, and by 1995 the 15 member nations[13] meant 15 different markets that required translation. Another ramification for Cardiac Care technical communication in the 1990’s involved product design advances that enabled customized production of increasingly complex and varied products. The advent of a more flexible software system architecture gave GMDC a competitive advantage by allowing Cardiac Care to more readily manufacture unique product versions within a single product line. For example, the standard pacemaker now could be custom designed with specific features that met the multiple price points and specialization needs of customers. Given that product specific documents, such as implant and reference manuals,[14] must accompany each version of a medical device sold, the additional time necessary for writing, translating, and publishing these specialized documents led to costly increases in cycle time (the length of time it took to complete an

[12] Passed on June 14, 1993, Article 4 of Directive 93/42/EEC allowed member states to "require the information, which must be made available to the user and the patient in accordance with Annex I, point 13, to be in their national language(s) or in another Community language, when a device reaches the final user, regardless of whether it is for professional or other use." As a result of this legislation, all member of the EU made their national language mandatory on products sold in their markets (Pilot,par. 10).

[13] In 1995 three countries, Austria, Finland, and Sweden, were added to the original 12. As of 2009 the EU has 28 member nations.

[14]Implant and reference manuals are the informational documents distributed with the appropriate GMDC applications software and devices or instruments. Implant manuals are typically 20-25 pages in length while reference manuals can be up to 500 pages in length.

authoring and translation project). And the costs to Cardiac Care were not just financial, there was the emotional toll of knowing that any delays in cycle-time meant a potentially lifesaving device was not made available to a waiting patient. Those overseeing the production of customized deliverables quickly recognized that the standard processes and tools for authoring and translation simply would not keep pace with the production of increasingly diverse medical devices and/in an ever-increasing number of languages.

Developing ASAPS

Prior to ASAPS, document development for Cardiac Care products was in many ways an autonomous and distinctly partitioned process, with little collaboration between authoring and translation. Often functioning more as individual contractors than members of a team, writers were typically responsible for writing an entire deliverable in a one-author-writes-one-book model of writing. As many as seven different authoring software platforms, on both PCs and Macs, were available in the Technical Communication department, and it was at the discretion of each writer to select which tool to use for a given document. The authoring tools most often used were Adobe FrameMaker, a desktop publishing application for larger documents that involved reference pages and indices(indexes), Quark CopyDesk, primarily used for more layout intensive projects such as newspapers and magazines, and even AmiPro, the now defunct word processing program that once competed with WordPerfect and Microsoft Word.

After the deliverable was prepared in English by technical writers (all Cardiac Care product texts were first written in English at the Minnesota, Gelderland, and on occasion, the Limberg locations), it was sent to the Limberg translation offices in the Netherlands. The translators converted the documents using software programs such as Futura Publisher that were altogether different from the authoring tools, and this lack of continuity created inefficiencies and disconnects during the transition period, which often led to conflicts in scheduling between writers and translators. Given the inadequacies of the system already in place to meet ever-increasing demand, upper level managers in Cardiac Care recognized that a more sophisticated, streamlined, and cost-effective system was needed if the Technical Communication and translation departments were going to keep pace with production. According to Mary Palmer, she was brought in as Senior Manager in 1994 explicitly "to work on fixing the translation problem."

Mary Palmer, an experienced technical communicator, bluntly recalled the system she had been brought in to correct as "really bad;" therefore, one of her first actions was to initiate the move of all authoring and translation processes to PCs using a single software platform. FrameMaker, a WYSIWIG (what you see is what you get) system, was selected. While some writers resisted the new platform, expressing a level of comfort and satisfaction with the systems already in place, they were given no other choice but to use FrameMaker. While the new system was a change, some/many of the WYSIWYG features were familiar to the writers, and the transition happened rather quickly. By the end of 1995, all of the writers and translators for Cardiac Care were

using the same Frame Maker system. According to Palmer, the transition was relatively positive for most of the writers because they immediately saw the benefits to their authoring processes, "FrameMaker gave the writers right away a lot of wins because it had things they didn't have before. It had automatic table of contents, indexes, etc." While helpful in creating greater continuity between authoring and translation, the consolidation to one desktop publishing system did not adequately address the three documentation issues exacerbated by increased product differentiation and expanding global markets: cost, cycle time, and auditability. In other words, the need to customize and translate print (and increasingly electronic) documents continued to increase costs and lengthen cycle times, as well as add complexity to the auditability requirements (tracking document changes).[15] Recognizing the need for a more profound change than FrameMaker could accommodate, Palmer was intrigued by the potential of single sourcing[16] for addressing the pivotal issues facing her department, and in the fall of 1996 hired Steve Miller to begin the in-house research and development of such a system.

Hired as project lead for what eventually became ASAPS, Steve Miller already had substantial experience in technical communication and project development. He had held multiple management positions in technical communication, and just prior to moving to GMDC, had played a principle role in developing and driving the

[15] Auditability is a deliverable's degree of readiness to successfully meet an audit by a regulatory body, such as the FDA in the USA. It refers to quality control mechanisms for monitoring the document creation process, which includes keeping track of what changes have been made to a document, when they were made, who was responsible for them, and why they were done. The specific document type drives these auditability requirements.

[16] Single sourcing is the reuse across documents and projects of texts stored in a database.

implementation of an innovative, single-source communication technology at one of the largest supercomputing companies in the world. Earlier, as co-founder of a computer company in California, Miller had functioned as communication liaison and effectively a 'salesman' during the implementation of a new technology. While Palmer's primary intention in hiring Miller was for him to develop a new single-source authoring/translation system, the only viable avenue for a new hire at that time was to replace someone who had retired. Consequently, Steve's official function for the first two years at GMDC was as leader of a technical writing team that was responsible for "generating something like 2 billion in revenue." In the fall of 1997, Miller hired a former colleague, Lisa Steepleton, ostensibly as a technical writer for his team but also to participate in the preliminary single-sourcing research he had begun. Despite Palmer's original intent, however, conducting research for the new system fell to the bottom of Miller's job priority list.[17] Given the heavy demand for deliverables expected from Miller's technical writing team, not to mention the urgency for speed driven by the new flexible software architecture, it quickly became apparent to Palmer and Miller that substantial progress would not be made on the single-sourcing project without fulltime effort by a dedicated team.

Garnering the necessary funding to launch the full-scale development of ASAPS required an extensive rhetorical effort that could stand alone as its own case study; therefore, a thorough explanation of what the effort entailed is beyond the scope of this

[17] Steve estimates that only 5% of his time was spent researching during his two years as Team Leader.

project. Essentially, Palmer, Miller, and a translation manager in the Netherlands, Erik Verbeck, presented a strong business case that ultimately convinced the relevant GMDC decision makers in both the US and Europe that the growth potential of flex architecture technology would not be realized without profound changes in the supporting technologies used by technical communicators and translators. By late 1998, Software and Development management in the US, to whom the Technical Communication Department reported, as well as Dutch management of the Translations Department in the Netherlands, had allocated enough funds[18] for Miller and a small team to turn a project that had been a gradual, evolutionary process into a more urgent revolutionary process. With the funding in place, Miller quickly hired a software specialist, Will Jones, with whom he had also worked at the supercomputing company.[19] The core members of the Project Development Team for what was now called the Advanced Single-Source Authoring and Publishing System (ASAPS) were in place: Steve Miller as project lead, Lisa Steepleton as business analyst, and Will Jones as software engineer. In addition to these three working out of the Cardiac Care offices in Minnesota, a team leader in the translation offices in the Netherlands, Erik Verbeck, also joined the ASAPS project team as translation analyst.

[18] Although ASAPS was developed in the US, Europe contributed 60% of the funding and the US contributed 40%.

[19] Both Lisa and Will had worked on Steve's project team in the early '90's at the supercomputing company.

How ASAPS Works

These four individuals, with occasional assistance from ancillary people not officially assigned to the team, devoted the next two years to researching and developing ASAPS. The result was a dedicated (designed exclusively for the Cardiac Care division of GMDC), state-of-the-art system designed specifically to meet the authoring, translating, and publishing needs for device manuals of implantable products and their accessories, as well as reference manuals packaged with software applications and instruments.[20] In addition, ASAPS was designed for future extensibility to support other types of multiple media documentation, such as online help and electronic books.[21] At the time, single sourcing and content management were still nascent technologies in technical communication (although industry analyst Ann Rockley and others were already observing an irrevocable shift toward such systems),[22] and ASAPS, a one-of-a-kind global content management system, stood at the forefront of the emerging single-source paradigm shift.[23] The key innovations of the system included modularizing

[20] Given the emphasis on print documents, ASAPS initially used SGML (Standard Generalized Markup Language), an ISO-standard used extensively at that time for document sharing in large government and aerospace projects. For ease of implementation and better internet applications, ASAPS later was converted to a SGML subset, XML (Extensive Markup Language), after it had matured to support more complex structures (e.g. indexes).

[21] As of 2009, ASAPS had expanded to include a wide range of manuals, EMC declarations, and online help for PC-based applications.

[22] Specifically, Rockley discussed the criticality of content management in single sourcing systems during a 2001 STC conference session (Rockley 2001).

[23] While the ASAPS team was not familiar with it at the time, Darwin Information Typing Architecture (DITA) (an open standard, single-source system with "an end-to-end architecture for authoring, producing, and delivering technical information" (Ames and Loomis 8)), was being developed internally by IBM at the same time ASAPS was being developed. Both systems were introduced in early 2001, and both were XML DTD (Extensible Markup Language Definition Type Document), which means they used a DTD structured framework for maintaining particular document styles in SGML/XML markup language. What set ASAPS

content and reusing text and graphics that had already been created. These innovations eliminated the retranslation of text that had already been translated and automated the layout and composition of each finished document in all target languages. Prior to its development, technical writers or teams of writers were responsible for writing entire documents that were then stored electronically under the relevant categories (i.e. IPGs, ICDs, Leads).[24] Any changes to a document, whether initiated by a new regulation or something as simple as a new address, meant the tedious and expensive process of changing each individual affected document in the system. With ASAPS, by contrast, the content is all stored as numbered components or *modules* in a central repository. A module is the smallest component in the repository and can include any or all of texts (which can be as long as a paragraph or as short as a single word), graphics, lists, or tables. A module can be reused in any of the *topics* to which it is linked. A topic is a single subject area composed of multiple modules that might form a chapter or subsection in a manual or a compilation of information about a particular product feature. Topics are independently reviewable and can be reused in many different documents or deliverables. Because modules, topics, and documents are linked, changes are made by updating the one or more affected module components, translating only these components, and using ASAPS to automatically apply the change to the appropriate affected documents. When creating new documents, writers then draw applicable content

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apart from other systems such as DITA was its high degree of functionality in formatting and content management (e.g. auditability), which made it truly state-of-the-art among emerging single-source technologies.

[24] IPG, Implantable Pulse Generator, is a therapy designed to correct slow heartbeats and ICD, or Implantable Cardiac Defibrillator, is a therapy designed to correct fast heartbeats.

(modules) from the repository of modules while also generating and storing any new content that was developed for the project.

While reusing components of text allowed for greater efficiency in both the writing and translation processes, it was the integrated, beginning-to-end management of content that brought greater continuity to the critical aspects of authoring and translation in technical document production. Prior to ASAPS, English text documents completed by technical communicators in the Minnesota office were essentially "tossed over the wall" to be dealt with by the translators in the Limberg office. Both writers and translators viewed their work as separate, sequential functions, resulting in longer cycle times and extensive repeated translations. By contrast, ASAPS integrated translation into the process sooner by supporting translation of text components once, in a given deliverable, and then storing the translated components for reuse in future deliverables. Addressing translation earlier in the writing process also encouraged authors to write with later translation in mind (i.e. using terms that were more readily translated into multiple languages). In addition to facilitating reuse and better integrating authoring and translation, ASAPS successfully reduced and standardized content while providing better tracking of content sources and changes throughout the document production process. This more efficient and auditable end-to-end system was particularly applicable to high

volume, highly repetitive documents, such as the manuals that constituted the vast majority of Cardiac Care's deliverables.[25]

Implementing ASAPS

Toward the end of 2000, ASAPS could support 8 Western European languages in addition to English[26] and was ready to be launched on actual Cardiac Care deliverables. To abide by strict medical device documentation regulations,[27] however, users needed to be trained in the system before they began using it for document production. It was at this point in ASAPS' development that training consultant Karen Nelson, whose technical communication background included managing a technical communication group for a small software development company, joined the team.[28] Nelson designed and delivered the required trainings for authoring with ASAPS. These trainings began in October 2000 and since then have occurred every few months on an as-needed basis. In preparation for the first launch of ASAPS, three people in Minnesota voluntarily agreed to train with Nelson in October 2000 and January 2001. By March 2001, two of these

[25] Because the majority of Cardiac Care documents are for "Class 3" or implantable medical devices, any system producing these documents must follow strict FDA and ISO regulatory protocols concerning the system's design, development, and testing. ASAPS was specifically designed to meet such auditing requirements. In contrast, deliverables for "Class 2" or non-implantable devices are subject to less stringent requirements and can be produced with more flexible systems.
[26] The languages were French, Italian, German, Spanish, Dutch, Danish, Swedish, and Portuguese.
[27] Regulatory bodies in both Europe and the USA impose strict guidelines on quality control of all systems used to develop content for documents and materials that accompany medical devices.
[28] Although she was eventually hired as an employee of GMDC, Nelson remained a consultant during the time period examined in this study. As of 2010, the core ASAPS Development Team members have not changed, they remain: Steve Miller, Lisa Steepleton, Will Jones, and Karen Nelson. Additional hires have been in areas of tesing, business analysis, style sheet development, and consulting.

initial ASAPS users, James and Brian, were ready to apply the system in a small scale implant manual project.

Over the next few years as more people in Minnesota learned how to use the system, ASAPS was implemented, project by project, for an ever-increasing number of Cardiac Care deliverables. While ASAPS did not replace all of the existing authoring tools, it did become the primary system for all Class 3 implantable device documents (which accounted for more than 95% of the content produced in the Technical Communication department).[29] As the number of deliverables supported by ASAPS grew, the Development Team continued to improve the system's performance and applicability for expanding global markets. By late 2001 Miller, who had been promoting the extensibility of ASAPS to departments outside Cardiac Care and translation, received the go ahead from Gelderland management to approach their technical communication group about implementing the system. After a concentrated week of on-site negotiations in early 2002 (Miller met face-to-face with the technical writers in the Gelderland office), ASAPS was further adapted to meet the needs of the Dutch subsidiary and was ready to be launched in Gelderland by 2004.[30] By this time,

[29] Additional reasons for ASAPS' continued co-existoence with other tools included older product lines already established in previous authoring systems (rather than convert every legacy document to ASAPS, some of which was occurring, updates continued to be made in the established systems) and deliverables for Class 2, non-implanted products, which were less regulated and could accommodate more flexible authoring tools. The few, Class 2 document types not appropriate for ASAPS (e.g. accessory documents with tremendous size variation, little content, and little reuse potential) typically stayed in a WYSIWYG (what you see is what you get) system, such as InDesign and FrameMaker in which content appears the same in both editing and final output.

[30] At the start of the negotiations, over 125 differences existed between ASAPS and the Gelderland group deliverable requirements. As a result of the negotiations, 20% of ASAPS was adjusted to accommodate

the system had been implemented in three locations (Minnesota, Limberg, Gelderland) and supported 13 different languages.[31] By 2009, it supported 21 languages and an ever-increasing variety of document types. [32]

Throughout the development and implementation of ASAPS, there was extensive interaction between the core Development Team members and the eventual users of the technology. In Minnesota, where the Development Team was located, Miller, Steepleton, and Nelson held frequent face-to-face meetings and one-on-one conversations with the writers and managers whose work would likely be affected by ASAPS. The team also communicated frequently with both of the Dutch offices in Europe, particularly Verbeck and a few of his translation colleagues in Limberg. The two locations maintained correspondence via frequent teleconferencing and regularly scheduled videoconferencing, not to mention an ongoing stream of emails. There also was a great deal of travel between the two offices. Miller and Steepleton, who primarily brought technical communication and software development knowledge to the project, visited Limburg on a number of occasions to better understand the needs of the translators and to explain the technology of the innovation. In fact, to work more directly with translation as they adapted to ASAPS and to further develop the relationship between the two offices, Miller

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Gelderland requirements (10% were direct changes and 10% were add-ons), and 80% of Gelderland deliverables were adjusted for ASAPS.

[31] In addition to the original 8 Western European languages, ASAPS was supporting Greek, Czech, Polish, and Hungarian.

[32] The additional languages were Turkish, Norwegian, Finnish, Slovak, Russian, Japanese, and Chinese. The additional document types included pacemaker lead and reference manuals, clinician manuals, technical reference manuals, catheter manuals, installation manuals, EMC declarations, and programmer reference manuals.

and his wife moved to the Limberg region for three months during the 2001 launch. Verbeck, whose experience was in translation and not technology development, made regular trips to Minnesota to share his language expertise, press for certain translation requirements, and learn more about the ASAPS technology. In 2001/2002, a translator from Limberg, Irene, spent nine months in the US learning the system and helping to refine ASAPS to better integrate with translation processes. In late 2002, when the Development Team actively began preparing the Gelderland writers for ASAPS implementation, travel and correspondence also began to include this region of the Netherlands. Miller, Steepleton, and Nelson travelled to Gelderland on a number of occasions to confer face-to-face with the writers on further refining ASAPS and to train everyone in how to use the system. On a few occasions Valerie and Marjo, two technical writers from Gelderland, travelled to the US for the same purposes.

The revolutionary changes ASAPS brought to Cardiac Care's authoring and translation processes have been extraordinarily successful in addressing the key issues driving its development. Use of the system by both writers and translators has greatly reduced translation costs and cycle times while at the same time enhancing the quality and auditability of deliverables.[33] Despite achieving these goals, ASAPS was not wholly embraced by everyone in a position to use it. Unlike the rapid and mandatory transition to FrameMaker a few years earlier, the much more voluntary transition to ASAPS tended to be gradual, particularly among the technical writers in Minnesota. A few of these

[33] In fact, by 2007, ASAPS was credited with lowering Cardiac Care's translation costs by over 50% and reducing what had been 1 to 3 week production cycle times down to 1 to 3 minute cycle times.

individuals supported the technological change immediately and voluntarily worked on projects with ASAPS. At the other end of the spectrum, however, were those who delayed working with the system, openly resisted the change, or simply never used it at all. (According to Mary Palmer, roughly 20% of the technical writers in Minnesota either quit or transferred out of the department during the early stages of implementation, although it can't be known for certain if the departures were in response to the advent of ASAPS). The system was fully implemented (e.g. achieved its original business scope in language, locations, and document type) in Minnesota and Limberg by 2003 and in Gelderland by 2005; however, everyone did not become fully supportive of the system within these timeframes. In fact, it took until 2006 for all of the Minnesota technical writers who produced ASAPS appropriate deliverables to fully accept the technology as their tool of choice.

The length of time it took for ASAPS users to go from first learning about the innovation to reaching a decision about whether or not to adopt it was far from uniform within and across implementation locations. For example, translators in Limberg embraced the system rather quickly while a number if writers in Minnesota took considerably longer to fully accept the new system. Given ASAPS effectiveness as an authoring and translation tool for repetitive large-scale documents, which constituted the vast majority of Cardiac Care deliverables, why was the system not wholly embraced by everyone in a position to use it? What was happening during the implementation of ASAPS to influence how people perceived and ultimately responded to the innovative

technology? In what ways might the profound changes ASAPS brought to the entire process of authoring, translating, and publishing have impacted user response? Before detailing the research project that these questions ultimately inspired, I will clarify the focus of my inquiry using the explanatory framework of Everett Rogers' seminal work in innovation diffusion theory.

Focusing the Inquiry: A Case of Innovation Diffusion

The transition to using ASAPS in Minnesota, Gelderland, and Limberg is a case of innovation diffusion, defined by Rogers as a "process in which an innovation is communicated through certain channels over time among the members of a social system"(5). The principle elements involved in the process (which are described in greater detail in chapter 5) include: the innovation, communication channels, time period, and social system. While all of these elements are integral to understanding how ASAPS diffused to the three GMDC locations, the time period of the diffusion is particularly interesting in this case due to the users' varying rates of adoption, defined as "the relative speed with which an innovation is adopted by members of a social system" (265). Rogers attributes the length of time it takes an individual to adopt an innovation to three elements: the degree of innovativeness of the individual adopting the new idea, the rate at which the innovation is adopted in the broader system, and the individual innovation-decision process. While Rogers explains in detail the impact of each of these time-

related elements on diffusion processes (see chapter 5 in Rogers), this study is concerned specifically with the early stages of the innovation-decision process, in which the potential adopters were learning and forming attitudes about ASAPS as they worked toward their individual adoption decisions.

Rogers reminds us that responding to a new idea is a process that "occurs over time and consists of a series of different actions;" therefore, "an individual's decision about an innovation is not an instantaneous act" (169). Indeed, innovation diffusion research across multiple decades and disciplines is replete with stories of change-inducing innovations being greeted with hesitation, suspicion, or even hostility by potential adopters. According to Rogers, the process of deciding whether or not to use a new idea or technology over one that is already known is inherently uncertain. He refers to the act of perceiving an innovation's newness and responding to the uncertainty generated by that newness as the *innovation-decision process* (168)[34] involving the following five stages: 1) *knowledge*, becoming aware of and learning about the innovation 2) *persuasion*, forming a favorable or unfavorable attitude about it 3) *decision*, engaging in activities that result in adopting or rejecting the innovation 4) *implementation*, putting the innovation to use if it's been adopted 5) *confirmation*, seeking reinforcement of the innovation-decision. Pivotal to this process is what Rogers calls the *gestational period* or time "during which a new idea ferments in an individual's mind" (Rogers 213). It is during this period that knowledge and attitudes about an

[34] Rogers' explanation of the stages in this process and how they relate to the decision to adopt or reject a new technology is discussed in greater detail in Chapter 4.

innovation intermingle toward an eventual adoption or rejection outcome (stages 1 to 3 in the innovation-decision process). To further differentiate the parameters of this study from other elements in the broader innovation-diffusion process, I will distinguish these initial three stages (knowledge, persuasion, decision making) by referring to them as the *adoption-decision process*.[35] Long before the ASAPS diffusion reached the adoption-decision point among individuals in a position to use the system, however, innovation diffusion processes had begun at other levels in the organization.

While the validity of much of Rogers' work centers on cases of adoption-decisions made by individuals (Dayton 362), his theory also extends to innovation-decision processes at the organizational level (referred to as the Innovation Process in Organizations). Indeed, Rogers claims that in many cases of organizational diffusion "an individual cannot adopt a new idea until an organization has previously adopted it" (402), which suggests that individual adoption decisions cannot be isolated from the organizational contexts in which they take place. Consequently, as part of an in-depth exploration of individual ASAPS adoption-decision processes, I must also consider the more complex[36] contextual elements that shaped the environment in which the individual user decisions took place. Rogers separates the Innovation Process in Organizations into two specific areas of activity – initiation and implementation. The initiation phase

[35] This term is used quite extensively by David Dayton in his 2006 article on innovative IT adoption by technical communication work groups (Dayton) and is helpful in conceptualizing the focus of this study within the broader innovation-decision processes.

[36] Rogers attributes the additional complexity of organizational innovation diffusion primarily to the number of people (ranging from those supporting or championing the innovation to those opposing it) who influence the process.

involves first *agenda-setting*, which identifies the problems or issues that create the need for an innovative change, and second *matching*, which fits an innovative solution to the problem (421). As previously discussed, Mary Palmer and Steve Miller played critical roles in the initiation of ASAPS as the innovative solution for problems facing the Technical Communication department. After an innovation is selected at the organizational level (which Rogers refers to as the *decision to adopt* point in the process), it is implemented in the following three stages: *redefining/restructuring*, *clarifying*, and *routinizing* (421). During *redefining/restructuring*, the innovation (typically brought in from outside the organization) is modified or re-invented to better fit with organizational needs and structures. At the same time, the organization might be restructured to better accommodate the innovation. While ASAPS was an in-house project and not wholly purchased from an external vendor, its ongoing development made re-invention and adaptation integral to its implementation. During the *clarification* stage, the innovation is more widely used and understood as questions about how the innovation works or how it affects the users are addressed. Essentially, this is a period of uncertainty reduction as members of the organization interact with one another to "gain a common understanding" of the innovation (428). As noted, the clarification stage for ASAPS was not uniform across the implementation locations. The final stage or *routinizing* is when the innovation becomes fully integrated in an organization's activities and is no longer perceived as a novel or separate entity. It is at this point that the innovation process is considered complete. If the innovation continues to be used after the initial adoption has

been secured, it then achieves greater permanence or *sustainability*.[37] The organizational innovation process for ASAPS was not complete until 2006, more than five years after the organizational decision to adopt the technology. Despite the stretch of time to become 'routinized', ASAPS has achieved long term sustainability as evidenced by its continued and ever-expanding deliverable applications.

Clearly, management or upper-level adoption decisions for solving specific organizational needs are critical to the diffusion of new ideas in organizations; however, choices made by designated decision makers are not the only adoption-decisions critical to the diffusion of an innovation. After all, it is the process of putting the new idea "into practice" (Rogers 179) during the implementation stage that ultimately determines if an innovation ever reaches the *routinizing* stage in an organization; therefore, it is the decisions of potential users to adopt or reject the innovation that ultimately lie at the heart of the diffusion process. As the ASAPS case demonstrates, embedded within an organization's innovation implementation are the singular adoption-decisions of each of the organization's members, most of whom did not make the initial decision to adopt the innovation. Despite the often mandatory nature of implementation in organizations (Rogers 29) (e.g. employees are given no other choice but to use a new technology, such as the mandatory switch to FrameMaker described earlier), Rogers points out that

[37] Rogers identifies two important factors in explaining an innovation's degree of sustainability within an organization, participation and re-invention. Innovations tend to achieve greater sustainability if organizational members participate in its development and implementation and if they are able to re-invent or change in ways that make it their own (429). Additionally, sustainability is enhanced when the innovation effectively meets the need(s) for which it was adopted (423).

organizations can actually employ three different approaches to structuring and thereby influencing the innovation-decision process among employees. In the *authority-innovation decisions* approach, the choice to adopt or reject an innovation is made by a few high-powered individuals, such as those with more organizational status or specific technical expertise. As a result, most of those affected by a new idea or technology do not participate in the decision making of the initiation phase and instead must comply with the adoption decision made by another. According to Rogers, this approach to innovation-decision results in faster rates of adoption than the other two approaches that follow (29) (which might explain why the transition to FrameMaker happened rather quickly). In the *collective innovation-decisions* approach, the choice to adopt or reject is determined by consensus among the members being asked to consider the innovation. Once the decision is made, everyone is expected to abide by it, regardless of the outcome of their individual innovation-decisions. Finally, in the *optional innovation-decisions* approach, individuals in the organization are given the choice to adopt or reject an innovation regardless of the decisions made by others in the organization.

Structuring innovation adoption and implementation at the organizational level might result in more control over how and when an innovation is put to use, but a more elusive aspect of this process is the degree to which individuals actually support an innovative change, particularly when the individual adoption-decision process is circumvented by authority-decision and employees are simply required to begin using the innovation. Rogers defines adoption, which occurs during the *decision* stage of the

innovation-decision process, as "a decision to make full use of an innovation as the best course of action available" (21). In other words, when multiple options are available, as in the ASAPS case, adoption is the deliberate choice of the innovation over other possible choices. The concept of choosing the innovation "as the best course of action" infers both individual agency in making the decision and a degree of support for the choice because it is the best available; as a result, the decision to adoption an innovation is a reflection of some level of support for its implementation. Rogers characterizes *implementation*, the stage following the decision to adopt, as "overt behavior change as the new idea is actually put into practice"(179); therefore, the act of using the innovation is not the same as the "strictly mental exercise of thinking and deciding" (179) that characterizes the adoption-decision process. The presumption that putting an innovation into practice is preceded by the decision to support its use might be applicable to organizational diffusion processes (as detailed in Rogers' initiation/implementation model of the Innovation Process in Organizations); however, the decision-followed-by-implementation sequence doesn't always apply to the individual innovation-decisions that occur during organizational implementation, particularly when the decision to use the implementation is not an optional one. Consequently, the use of an innovation by members of an organization does not necessarily indicate their support for it, or to use Rogers' terms, putting an innovation into practice does not mean it's been adopted at the individual level. Differentiating between adopting or supporting an innovation and simply using it is important to organizational diffusion theory because the longevity or

sustainability of an innovation often depends on the level of support it receives from its users (Rogers 429).

While both individual and organizational processes have been at the center of much innovation diffusion scholarship, less attention has been given to the individual adoption-decision processes *within* organizations (Dayton 357), particularly when the use of the innovation often precedes the actual adoption of it. In focusing on specific adoption-decision processes during the organizational diffusion of ASAPS, this study is positioned to illuminate those factors influencing full acceptance of an innovation as opposed to those factors that simply compel people to begin using the innovation.

CHAPTER 3: Review of the Literature

The Advanced Single-Source Authoring and Publishing System (ASAPS) implementation at the center of this study is a case of organizational innovation diffusion across cultures. As decades of technology transfer scholarship among a myriad of disciplines and theoretical perspectives demonstrate, however, implementing a new idea among diverse individuals within a large organizational system is laden with a seemingly endless interconnection of variables (e.g. the individuals involved, the implementation approach, historical and cultural factors, etc.). Given the wealth of potential avenues to explore, the focus of this study has been confined to just the adoption-decision process and the more compelling factors influencing it. The review of the literature, therefore, is limited to the following innovation diffusion aspects that are of most interest in the ASAPS case: organizational and cultural contexts, power/agency and communication, and the role of technical communicators in the process.

Study Terminology

Since its first publication in 1962, Everett Rogers *Diffusion of Innovations* has been the principle text for the study of technology transfer and innovation diffusion (Dayton 361). Now in its fifth edition (2003), Rogers has expanded and validated his diffusion theory with the analysis of over 5,000 studies published in multiple disciplines. Given the time-tested importance of Rogers' central work, I structure the following

literature review around his extensive analyses and established terminology of diffusion processes. To begin, I will clarify why I use Rogers' term *innovation diffusion*, rather than another often used term, technology transfer, when discussing the ASAPS implementation.

Given this study's emphasis on Rogers' innovation diffusion work, the term has been used fairly consistently to this point; however, a review of the literature reveals that the terms *technology transfer* and *innovation diffusion* often are used interchangeably. Nonetheless, a number of scholars point to subtle differences in the two terms which can influence our fundamental perception of the diffusion/transfer process. The act of "transferring" a technology is concerned with the point-to-point transmission of tools or hardware to specific receivers. It is essentially a one-way transaction, whereby "the results of basic and applied research are put into use by receptors" (Rogers 150), and it is primarily cross-cultural, involving "the circulation of know-how across national boundaries" (Goulet 6). Rogers points out that with this simplified, linear conception "we have underestimated just how much effort is required for such transfer to occur effectively" (152). To encompass more of what occurs in actual technology transference and adoption, he shifts to the concept of "diffusion (as) the process in which an innovation is communicated through certain channels over time among members of a social system" (5). It is via this semantic change that Rogers expands the more two-dimensional view of innovation 'transfer' (and its limited focus on technological hardware) to include the factors of time, multiple communication modes, variations

among social systems, and the software information component of technology. As Williams and Gibson (1990) point out, technology transfer is much more than the tangible product, it is the "application of knowledge" (10). While Doheny-Farina (1992) uses the term technology transfer, rather than diffusion, he acknowledges it as "an umbrella term that refers to an entire range of activities" and defines the ultimate process as "not transfers at all but instead series of personal constructions and reconstructions of knowledge, expertise, and technologies by the participants attempting to adapt technological innovations for social use" (ix). Seely (2003) also acknowledges the hard and soft components of technology transfer by defining it as "the processes and consequences of moving technological ideas, skills, processes, hardware, and systems across a variety of boundaries" (8). While scholars may use different words to identify the process, I adhere to Roger's multi-dimensional term 'diffusion' as a way to distinguish it from the earlier, linear conception of transferring a technological tool from one point to another. Additional terms such as transition, implementation, and adoption-decision are used to describe elements within this case; however, the overarching term I use for the process of implementing an innovative technology is innovation diffusion, or more specifically, the ASAPS diffusion.

Approaches to Studying Innovation Diffusion

The "often chaotic" and "disorderly" process of organizational innovation diffusion is difficult to research because the circumstances and variables that might influence interactions between the developers of the technology and the potential users can differ widely from one adoption to the next within the same organization (Williams and Gibson 16). Much of the diffusion scholarship involving the successful delivery or implementation of innovative technologies tends to isolate those factors contributing to rate of adoption, in particular the characteristics of the users and their perceptions of the innovation. While a large body of research explores how a variety of personal characteristics might influence receptiveness to a new technology, an individual's level of innovativeness is the predominant user-trait variable in studies of adoption decision processes (Rogers 2003). In fact, of all the diffusion concepts that have been studied, most is known about innovativeness or "the degree to which an individual…is relatively earlier in adopting new ideas than other members of a system" (267). Rogers summarizes what is known about the link between innovativeness and adoption rate using the following three categories: 1) socioeconomic status, 2) personality variables, and 3) communication behaviors (299). He offers a number of research-supported generalizations for each area of influence such as 1) "Earlier adopters are no different from later adopters in age" (288), 2) "Earlier adopters have more intelligence than do later adopters" (289), and 3) "Earlier adopters have more social participation than do later

adopters" (290).[38] Applying these factors, Rogers calculates the *degree of innovativeness* among potential adopters to indicate the rate at which someone might adopt an innovation. Adopters are then placed in categories on a scale ranging from those who adopt quickly (Innovators) to those who adopt toward the end of the diffusion process (Laggards).[39] While these adopter categories have been used often (and rarely questioned) in innovation diffusion research, for example Klein (2005) notes that "part of the folklore of technology management" (3) is the assumption that most laggards are "suspicious of change" (3), more recent scholarship casts doubt on emphasizing prescribed traits as an explanation of adoption rates. Categorical "schema deflects attention from the specific reasons why some people do, or do not, adopt any particular innovation" (Klein 14) and assumes behavioral consistency that does not explain why someone might be an earlier adopter of one innovation and a later adopter of another. Particularly within organizations, factors that have little to do with a user's level of innovativeness, such as misaligned goals, poor communication, and "power politics" can have a tremendous influence on whether or not a technology is adopted (Munir 1407). Despite detailing adopter qualities and categories, Rogers acknowledges that a user-

[38] Under *Socioeconomic Characteristics*, Rogers identifies 6 generalizations (288), under *Personality Variables* he identifies 10 generalizations (289), and under *Communication Behavior* he identifies 9 generalizations (290).

[39] According to Rogers' categories, the earliest adopters in a particular social system fall into the category of Innovators (2.5%), or the most venturesome in a social system who demonstrate a desire for "the rash, the daring, and the risky" (282). Following Innovators are Early Adopters (13.5%). These individuals tend to garner the respect of others in the social system and function as role models in the diffusion process. Following these influential individuals is the largest category grouping. Early Majority (34%) adopters tend to deliberate longer than the groups that precede it. Late Majority (34%) adopters are also one of the larger category groupings. These adopters tend to be skeptical and adopt out of necessity or after most others in the social system have adopted. Finally Laggards (16%), who tend to be the most skeptical and cautious members of the social system, are the last to adopt.

centered research approach can lead to a propensity for individual-blame which is "the tendency to hold an individual responsible for his or her problems [in adopting a new technology], rather than the system of which the individual is a part" (119). In other words, diffusion research emphasizing the user might miss broader, more compelling variables influencing the process.

In contrast to the extensive explorations of user characteristics, a large body of diffusion scholarship focuses on the characteristics of the innovations themselves and the perceptions users have of them. According to Rogers, five perceived innovation attributes serve as predictors of adoption rates: 1) the innovation's relative advantage over other options 2) compatibility with existing values and needs 3) complexity of use 4) trialability in terms of first trying it for a limited time period 5) observability of the innovation's outcomes (221 – 266).[40] Some research does suggest that the perception of an innovation's usefulness relates significantly to whether or not it gets used (Karahanna 1999; Chang 2005); however, the emphasis on qualities or usefulness of a new technology in diffusion research tends to reflect a *pro-innovation bias* that assumes an innovation should be adopted (Rogers and Shoemaker 1971). Biasing the innovation during diffusion processes stems from the assumption that users are motivated to adopt effectively designed technologies, yet research repeatedly demonstrates that innovation-driven diffusions often do not lead to adoption (Williams and Gibson 1990; Doheny-

[40] While Rogers points out that "diffusion scholars should keep an open mind toward other possible attributes that may be important in a specific situation for a particular set of individuals adopting a unique set of innovations" (226), he claims that "most of the variance in the rate of adoption of innovations, from 49 to 87 percent, is explained by [these] five attributes" (221).

Farina 1992; Durack 2003; Dayton 2006) Rogers points out that most diffusion scholarship doesn't recognize or acknowledge this often inherent pro-innovation bias, and the result has been "a failure to learn about certain very important aspects of diffusion"(107) that do not center on the innovation itself. Such narrowly-focused approaches to studying diffusion tend to reduce the process "to chronologically ordered one-way stages" (Williams and Gibson 15) and one-dimensional, technology-centered models (Coppola 287) that in many ways obscure the more complex interactions inherent in diffusion. As Nancy Coppola (2006) points out in her guest editor's introduction to a *Technical Communication Quarterly* special issue on technology transfer and diffusion, linear approaches to diffusion are based on the point-to-point transfer of information about the technology rather than "the heart of communication" which includes the motivation, ethos, and cultures of those involved in the process (288). In other words, a technology-focused understanding of diffusion misses the more complex communicative elements inherent in the process.

While Rogers defends the use of point-to-point stages for explaining the time-oriented nature of innovation-decision processes (see Rogers 196-197), he acknowledges that the evidence of linear processes is less clear during the persuasion stage of innovation-decision making (198). According to Rogers, innovation adoption is essentially an uncertainty reduction process whereby potential users gain knowledge of and form attitudes about an innovation. Knowledge of an innovation might include simply being made aware of it, learning how to use it, or knowing details about its

functioning (Rogers 2003, 173), while persuasion consists of evaluating the innovation and developing an attitude or feeling about it (175). Rogers notes that our understanding of this interrelationship of knowledge and persuasion in deciding whether or not to adopt an innovation is not as fully developed as other areas of his theory and urges researchers to expand beyond either the traditional user-centered or innovation-centered models to more fully examine the intersections of "social and communication structural variables" (126) influencing the innovation-decision process. Indeed, Rogers acknowledges that his theory limits the concept of persuasion to becoming "more psychologically involved with the innovation" (175) by way of an internal attitude change that occurs through the reduction of uncertainty about it. While he notes that those (e.g. change agents) attempting to motivate adoption must understand the needs of the client in order to "transmit to them only information that is relevant" (369), his interpretation of persuasion in innovation-decision processes centers on user reactions to the technology and does not sufficiently incorporate the concept of rhetorical intent by those attempting to influence the process.

Rogers' very conception of innovation diffusion as "a social process in which subjectively perceived information about a new idea is communicated from person to person" (Rogers 5) opens the door to a more convergent understanding of diffusion processes that incorporates the interactive and iterative complexities of organizational culture, wider social systems, and simultaneous and continuous idea exchange in technology transfer (Williams and Gibson 1990; Strang and Meyer 1994; Dayton 2006).

Increasingly, research has been expanding the analytical lens to examine contextual factors or variables not necessarily linked to the innovation itself or to the assumption that technologies somehow speak for themselves. The sociotechnical perspective in particular has been useful in linking technology to the broader context whereby individuals and the social systems of which they are a part attribute capabilities, such as what a technology can do, to the innovations (Munir 1408). Seen in a sociotechnical light, innovations are not only physically constructed by human beings, they are also rhetorically constructed within social systems that ultimately interpret and shape their meanings (Bijker et. al., 1987; Latour, 1987).

Applying a sociotechnical perspective in his study of communication technology adoption in a large corporation, Craig Hansen (1996) argues the importance of researching technology in terms of its relationship to individual users and the broader social context. He points out that in addition to varying personality preferences, the decision to use a new technology is influenced by a variety of perceptions, such as those of work responsibilities and the organizational context. The meaning attributed to an innovation is also influenced by contextual changes during the ongoing process of implementation. When examining multiple innovation-decision variables involving both the innovation and the complex system in which it diffused, Liette Lapointe and Suzanne Rivard (2005) make a distinction between early and later implementation stages. They claim that early resistance is typically due to the innovation itself and stress the importance of examining individual behaviors “rather than considering the group as a

unified entity" (484). Resistance in this early stage of implementation can be viewed as a "window of opportunity" (Tyre and Orlikowski 1994) for recognizing how individuals perceive the innovation and adjusting or adapting it accordingly. Later in the implementation process, however, Lapointe and Rivard identify social factors, such as the significance of the technology to the broader system and individuals advocating for the technology, as contributing to later adoption resistance among individuals in organizations. Lapointe and Rivard refer to this later stage resistance as essentially "politicized" (484), making it "important to understand how and why individual resistance behaviors converge" (484). As these and other scholars point out, examining the individual resistance factors within the larger social system or organization, rather than simply in relation to the innovation, is essential to understanding innovation-decision processes.

In her 2004 study of high tech innovations diffusing to slow adopting countries, Cherie Whitney claims that by emphasizing the first two stages of the adoption-decision process (knowledge and persuasion), field marketers "were able to drive diffusion into slow IT adoption regions" (439), thus she calls for closer examination of the knowledge/persuasion stages of diffusion. Operating from the assumption that "little is known about what factors influence the formation and change over time of user perceptions of and attitudes towards IT innovation" (371) and that potential adopters are influenced by a diversity of beliefs held prior to the diffusion process, Xia and Lee (2000) found in their empirical study of influencers on user perception and acceptance of IT

innovations that "persuasion, training, and experience are important external variables that influence the formation and change over time of user evaluation and adoption of IT innovation" and suggest that "persuasion is a powerful but underutilized mechanism for enhancing user adoption" (380). Training alone only significantly addressed "the formation of user perceptions on ease of use, compatibility, visibility, and trialability" (380) while persuasion is a significant factor in influencing "the formation and change over time of user perceptions, attitudes, and intention related to IT innovation" (380). In 2005 in a study of the psychological aspects of technology transfer, Chang, Chen, Chiang, and Jiang make a distinction between system acceptance, or "intent to use," and knowledge acceptance, or "acceptance of advice" (151). They argue that "the transfer of technology at the individual level is clearly influenced by psychological behavior of individuals…[and that] part of any transfer must involve persuading the users of the technology" (151); therefore, transferring knowledge "must consider three factors including self-confidence in the domain, confidence in the source, and discrepancy in the solutions" (151). Although these claims lack the more nuanced support that an in-depth rhetorical analysis might bring, it focuses us on the broader persuasive elements in diffusion. In their 2000 study of the impact rhetorical strategies have on innovation decisions, William King and Jose Kugler emphasize the importance of the individual promoting the innovation (referred to by Rogers as the *Change Agent*). They argue that "the champion of an idea must state, via a rhetorical strategy, the reasons warranting adherence to that idea" (486) and point to "the impact of rationality and credibility in the

rhetoric of a decision situation" (496). Of course, to adhere to this approach, the potential users, or audience, must be taken into consideration, and given the often intercultural nature of innovation diffusion, this raises the question of cultural influences on what is considered rational or credible concerning a new idea or innovation. Indeed, in one of the few studies specifically linking the rhetoric of innovation diffusion to intercultural technical communication, Barry Thatcher (2006) claims that "cultural systems exemplify and reinforce different rhetorical traditions that significantly influence the teaching and integration of new technologies" (387). In other words what is rhetorically effective in one cultural context might prove to be ineffective in another.

Context and Innovation Diffusion

To better understand these rhetorical and contextual complexities in diffusion, Rogers (2003) himself suggests that standard, heuristic research approaches to diffusion research "constrain the intellectual progress" of the field (xix) and urges scholarship to "dig deeper" (101) and with a "wider scope" (115), particularly as we expand our inquiries to encompass broad yet subtle factors in organizational innovation diffusion processes. Indeed, Rogers points out that "compared to other aspects of diffusion research…there have been relatively few studies of how the social or communication structure affects the diffusion and adoption of innovations in a [broader] system" (25). Noted diffusion scholars, Williams and Gibson (1990) had already made the claim that

organizational innovation diffusion brings a level of complexity to the process that cannot be compared directly to more traditional, point-to-point models of innovation diffusion. They suggest that "people do not have the same freedom of choice in their roles as corporate employees as they do outside those organizations. Influences within the corporation include whether or not use is mandated by management and the extent to which the innovation is supported by the organizational reward system" (49). Noting the intractable subtleties influencing organizational systems and relationships, they also note that "serendipity may play a larger role in effective transfer than most people would like to admit; an important link may arise from a friendship, a crisis consultancy, or office or laboratory layout" (13). For example, in a study of adoption decision processes in late diffusing technologies, Arun Vishwanath and Gerald Goldhaber (2003) find that the role of beliefs in innovation decisions supports the idea that "employees within organizations often do not control adoption decisions, hence they are influenced more by the system's contribution to their overall performance, and by the system's complexity or effort that they would need to expend on learning the new system" (566) than by specific aspects of the technology itself. The researchers therefore suggest that beliefs indirectly impact the intention to adopt by influencing broader attitudes about their relationship to the organization itself.

In a more recent study, Yuqiong Zhou's (2008) analysis of the social and contextual factors influencing innovation-decision processes makes a distinction between innovation adoption at the organizational or group level and innovation-decision

processes among individuals within the organization or at the "intra-organizational level" (476). While his research supports earlier claims that perceived attributes of innovations are "the most powerful predictors of innovation adoption" (491), Zhou's findings also lend support to Vishwanath and Goldhaber's work. Zhou argues that "traditional diffusion research…fails to examine the interaction between individuals and social or institutional contexts…social and institutional norms" (492) and highlights the unseen social pressure within organizations to use a new technology even if no active promotion (or overt 'politicizing') is occurring. He points out that individual will and contextual factors influence the decision making and result in "two distinctive groups of adopters – voluntary adopters versus forced adopters – who adopt the innovation under different circumstances" (476).[41] Rather than basing these adopter categories on user characteristics, as Rogers does, Zhou situates adopter types within the contextual circumstances of the implementation itself.

As research steadily answers the call for a more contextual, interpretive approach to studying innovation adoption within organizations, it has become increasingly evident that hierarchical and relationship dynamics are integral to organizational diffusion processes. In their study of cross-cultural technical and institutional dimensions of diffusion, Roland Kaye and Stephen Little (1996) point out that different priorities compete for primacy during implementation. "If technical considerations dominate this

[41] Zhou's theoretical contribution to innovation diffusion scholarship is the identification of these four adopter categories, which are determined by an individual's level of voluntariness during the innovation decision process: 1) voluntary adopters, 2) forced adopters, 3) resistant non-adopters, and 4) dormant non-adopters

process, a technocratic rationality is likely to hold sway, if institutional concerns dominate, then the technical limitations of the complex system are likely to be ignored" (30). Consequently, Kaye and Little argue that the successful "diffusion of complex systems requires at least some reconciliation of the very different dynamics operating at institutional levels" (30). In a similar vein, Russell Kahn's (2000) dual-case study of the effects of new technology implementation on organizational structures suggests that alliance-building is critical to innovation adoption processes. Organizations that experience successful implementation build "informal structural alliances that cross formal hierarchy…[such alliances develop via] scheduled and unscheduled meetings, workshops, consultations, and memberships on key committees" (312) while organizations with unsuccessful implementation make "few attempts to build alliance" (342). Kahn concludes that disconnecting day-to-day decisions about new technologies from the formal organizational hierarchy, something Kahn refers to as "low levels of vertical interdependence" (344), enables greater "adaptation and change within formal structures without overtly disrupting them" (344). Additionally, Kamal Munir's (2002) study of the normative and cognitive influences on 'sense-making' during technology transfer in organizations finds that a myriad of contextual factors might influence the successful transfer of technology and highlights culture, communication breakdowns, and "power politics" (1408) as particularly disruptive to the process. Pointing to the profound importance of shared understandings within organizations (1404), Munir suggests that technologies "are more likely to be successfully incorporated into an organization if the

environment is changed in accordance with the requisite norms" of the system (1423). Such research suggests that the inevitable changes brought about by the adoption of a new technology often challenge the status quo of hierarchy and how individuals relate to one another within organizations.

In their groundbreaking work about the diffusion of computer-based communication in organizations, C*onnections: New Ways of Working in the Networked Organization*, Robert Sproull and Sara Kiesler (1998) point out that the introduction of new technology "does not merely add new behaviors to an unchanging base. Rather, the process is a transforming one, leading to and reinforcing fundamental changes in how people work, interact, and think" (159). In other words, the transformative changes brought about by innovation adoption aren't driven solely by the technology, and instead are driven by organizational learning that leads members "to think in transformed ways" (159). Williams and Gibson (1990) refer to the very act of transferring technology within organizations as "the application of knowledge" (10) where ideas are exchanged repeatedly, and often simultaneously, in an iterative process "via one or more communication channels" (13). Such transformative thinking among users adopting new technologies is indicative of the learning that accompanies innovation diffusion, and

according to Rogers and others, the communication of new ideas that accompanies learning is the essence of innovation diffusion processes.[42]

Pivotal to the concept of learning during diffusion are the interpersonal interactions among members of an organization involved in the innovation-decision process. Noting that "organizations do not communicate – people do" (278), Williams and Gibson describe communication among organizational members as "the social infrastructure for technology transfer" (277); in fact, interpersonal communication has been identified as one of the principle factors shaping the rate of the innovation-decision process (Gatignon and Robertson 1985; Rogers 2003; Whitney 2004). Rogers proposes a model of similarities and differences among individuals to explain what compels the exchange of ideas, based on the assumption that idea exchange is most frequent between similar people because they "share common meanings, beliefs, and mutual understandings" (306). Rogers identifies similarities and differences in attributes among people as either homophily, "the degree to which a pair of individuals who communicate are similar," or heterophily, "the degree to which pairs of individuals who interact are different" (306). He suggests that communication, and thus innovation-adoption processes, occur more readily among those who are similar than among those who are dissimilar. It follows then that adoption-decision processes among people who do not share common beliefs and understandings might be inhibited. This rather simplistic

[42] In a 1990 report on the 'state of the field,' Gibson, Williams, and Wohlert review of the literature revealed communication as one of the four principle dimensions in technology transfer: 1) content, 2) context, 3) legal, ethical, and economic consequences, 4) communication.

approach to communication speaks to the convergence model whereby "individuals or groups share information in order to reach a mutual understanding of each other" and through shared meanings move toward one another (Kincaid 31). David Strang and John Meyer (1994) acknowledge that similarity is a factor in compelling "an actor to use another's choices and the consequences of those choices as a guide" (103); however, they point out that "the predictions of simple relational models will go astray if they are not made conditional on the larger cultural context" (109). For perceptions of similarity to contribute to diffusion, they must 'make sense' not just between individuals but within the broader social structures of the organization; therefore, "the cultural match between practice and adopter may have substantial effects on the pattern of diffusion" (109). Indeed, conceptions of communication during innovation diffusion are "beginning to account for such considerations as power, contingency, and unpredictability" within and across organizations (Zachry v). Given that it is "common for the exchange of ideas to occur between people/organizations of different cultures, with different intentions, and varying skill levels" (Whitney 433), the concept of similarity and difference in constructing shared understanding reflects a simplistic, either/or perspective of communication that does not do enough to explain the complexities of interpersonal communication occurring within wider organizational contexts.

While diffusion scholarship has been incorporating what Rogers (2003) refers to as the broader complexities of communication processes, as well as the nature of the system in which the diffusion occurs and the effort of those participating in the diffusion (265), the research in these areas tends to emphasize "barriers to overcome and boundaries to span"[43] rather than the subtleties of "movement and flow" that characterize the linguistic and cultural differences that are pervasive in diffusion processes (Coppola 288). Approaching the process from the perspective of technical communication, Coppola claims that traditional innovation diffusion research does not "get to the heart of communication because they base their analyses on the concept of information transfer" (288) and models of "barriers and failures" (290) that assume a one-way, chronological process. To better examine the rhetorical complexity of innovation diffusion, particularly during the adoption decision process, Coppola argues for a more theoretically sound, navigational approach "in which the dependent variable is successful technology transfer and the independent variables encompass the subtleties of language" (290). Extending this view, Slack, Miller, and Doak (2006) reject the traditional identification of technical communicator as "surrogate engineer" who is expected "to assure that messages are accurately encoded and that they are transmitted with minimal noise over clear channels" (30) essentially making the communicator a "transparent" channel in the process (30).

[43] Williams and Gibson (1990) summarize the three most common barrier models of technology transfer or innovation diffusion as: 1) appropriability, in which deliberate transfer isn't necessary because technologies sell themselves 2) dissemination, in which innovations "flow from expert to nonexpert" (287) 3) knowledge utilization, in which strategic communication between developer and user facilitate the diffusion of the innovation (287).

They point out that such thinking limits our perception of communication[44] and argue for more of an *articulation* view whereby technical communicators "work toward the negotiation of symmetry between encoder and decoder…[and give] attention to the complex variable contexts within which senders and receivers produce meanings and how those contexts connect in the circuits of meaning and power" (36). Essentially, they argue for a conception of communication as an ongoing process of articulation constituted in (and constituting) the relations of meaning and power operating in the entire context within which messages move" (37). Offering his own examination of IT adoption processes by technical communication groups as an example, Dayton (2006) takes diffusion research further down these theoretical paths by calling on technical communication scholars to engage in more "in-depth analyses of the rhetorical clashes and mutually transforming interactions of groups' interpretive frames when innovation participants and stakeholders attempt to understand, refuse to use, or attempt to fit these innovations into their knowledge-creating activities" (359). In other words, to better understand the rhetorical nature of adoption-decisions in organizations, technical communicators should view them as navigational processes (as opposed to point-to-point

[44]Slack, Miller, and Doak identify two traditional perspectives of technical communication which they argue limit our understanding of context and power in communication processes: 1) The *transmission* view of sending meaning via a channel to a waiting receiver renders technical writers as conduits that are "transparent and seen as contributing no meaning. [They therefore] possess no power (and therefore cannot exercise it) whenever communication" is successfully transmitted to the receiver (31) and 2) The translator view where the receiver role is "just as constitutive of the communication process as that of the sender" and both the sender and receiver "contribute…to the construction of meaning" (32). Slack, Miller, and Doak argue that the transmission views understanding as "symmetry between the translation processes" of sender and receiver and misunderstanding as "a lack of symmetry" (33). These perspectives of communication are in keeping with Rogers' similarity and difference approach to communication during diffusion.

transmissions) that are enveloped in an ever-evolving complexity of social and cultural contexts.

Technical Communication and Innovation Diffusion

The link between innovation diffusion and the field of technical communication was initiated in 1992 by Stephen Doheny-Farina's pivotal book *Rhetoric, Innovation, Technology: Case Studies of Technical Communication in Technology Transfer.* In his influential work, Doheny-Farina argues two key points that opened the door to a new avenue of research in technical communication. The first point is that "technology transfer is a rhetorical dynamic" (4) and the second is that "the process of adapting technology from its origins to the marketplace must involve technical communicators" (97). In contrast to the conventional view objectifying the innovation as a clearly established entity seen in a similar way by all involved, Doheny-Farina points out that "there is no clearly objective fact or physical entity that proceeds uninterrupted from the lab to the market" (6). Rather than 'handing off' a static object, technology transfer[45] instead involves the negotiation of interpretations among those individuals integral to the adoption process. Not only do new technologies have "different meanings in different settings," (6) according to Doheny-Farina an innovation "engenders a reciprocal shaping as it develops; the innovators, the innovation, and the users of the innovation are all

[45] Since Doheny-Farina uses the term *technology transfer*, as opposed to *innovation diffusion*, throughout his text, the term *technology transfer* is used when discussing Doheny-Farina's theory.

changed through the process" (6). In other words, Doheny-Farina set the stage for understanding diffusion as an essentially rhetorical process involving the social construction of shared meanings among and between those who have a vested interest in the outcome of an innovation's implementation.

While Rogers also emphasizes the communicative nature of innovation diffusion, his underlying assumption that information addressing uncertainties about new ideas is transferred along identifiable channels overly simplifies the process and "treats knowledge as an object that exists independently of the participants in the innovation venture" (Doheny-Farina 8). What is missing in this perspective, according to Doheny-Farina, is an understanding of how and why individuals and groups within larger systems adhere to different means of interpreting an innovation regardless of how much "rational information" is transferred with it (10). He points out that collaborative relationships built through "negotiation and sharing of perspectives, values, language, and knowledge" (10) are central to the transfer of technology and argues for a more complex examination of how the rhetorical situation influences "the communicability of the moment" (10) and the construction of shared meanings. Doheny-Farina goes on to propose that technical communicators, with their technical knowledge of the innovation and rhetorical knowledge of audience (in this case the potential users of an innovation) are uniquely qualified to act as "bridging agents" in negotiating the relationships between innovations and users.

Since the publication of Doheny-Farina's work tying a social-constructionist view of rhetoric to technology transfer processes, scholarship has been examining the role of technical communication at "the intersection of technology and its various producers, users and publics" (Ornatowski 599). Operating from the assumption that the adoption and use of technology is much more complicated than simply the use of a tool (Albers 2005), research has been exploring the reciprocal shaping that occurs between communication technologies and social systems and the mediating role of technical communicators and writing in these processes (e.g. Duin and Hansen 1996; Rehling 1999; Kahn 2000; Kramer 2003; Dayton 2006, Moses and Katz 2006). What we've learned from this considerable body of scholarship is that technical communicators participate along the entire spectrum of technological innovation processes having "always been at ground zero for the creation, development, and release of new technology products" (Ortega 16). Most notable of these is the technical communicator's facilitative or negotiating functions within organizations (Fisher 5), which includes "responsibilities for improving relations between people and their computers" (Zimmerman 200). Given that "technical considerations alone do not account for the final shape of emerging technologies…[and that] technologies result from complex-decision making in which language…plays a part" (Staples and Ornatowski 44), technical communicators, as mediators, are positioned to influence innovation adoption processes. Nardi and O'Day liken this influence to that of a gardener "who can translate concepts and mechanisms back and forth between the domain of the work and the technology

itself" (rpt. in Hart-Davidson 154). Such activities help to "grow the productivity" in organizations by tending to "issues of identity and strategy" (Hart-Davidson 154) as users develop the necessary technological expertise. Facilitation of these learning processes is related to rhetorically-based skills of "leadership, commitment and empowerment and teamwork and group problem solving" (Shepherd 215). Indeed, Longo (2000) reminds us that the rhetorical processes technical communicators engage in when communicating about technology play a critical role in shaping our perceptions of technology, and that through their work, technical writers have a profound influence over "how technical knowledge is made"(x).

While scholarship has clearly established the multiple interfaces of technical communication and technology, what is less evident is how technical communicators go about accomplishing their "bridging" function. Zimmerman (2001) reminds us that the role of the technical communicator "is not a cultural absolute but a socially constructed reality with a history of development and change" (202); consequently, identifying the enduring ways in which technical communicators influence innovation diffusion has proven difficult. According to Hart-Davidson (2001), there is a lack of theory explicating the core expertise of technical communicators which potentially inhibits the portability of particular skills during technological change (146). For example, the advent of single-source systems (such as ASAPS) has brought about both glaring and "fine-grained" changes to the field and we are just beginning to explore what this means for technical communicators (Hart-Davidson 30). Scholars recognize that technical communicators,

by virtue of their alliance with new technologies, "are constantly face-to-face with the management of difference" (Web and Keene 116); however, it's not clear how the differences brought about by technological change, particularly during innovation diffusion processes, are actually managed.

Taking into account the increasingly global nature of work, Strang and Meyer (1994) point out that the change or difference that technical communicators manage "is not simply in interaction and interdependence [between technology and user]…but also in culture" (112). As a result, technical communicators in the 21st Century workplace increasingly function as "manager[s] of diversity" and "catalyst[s] for contact and change within and between cultures" (Web and Keene 116). Indeed, there have been increasing claims that technical communicators' "skills in cultural awareness, international project management, and virtual team building are becoming ever more critical" (Brown 3). Much of the intercultural technical communication research, however, has been in areas of translation, global virtual teams, pedagogy, and professional communication (see Lovitt and Goswami 1999) and not in the specific activities of innovation diffusion.[46] Doheny-Farina addresses the relevance of culture difference in technology transfer processes by acknowledging that "even when all parties expect to benefit, technology transfers can still be hindered by the differences among the people and cultures across the

[46] The majority of research in this area (see Norton 2000, Salvo 2001, Jones 2005, Conklin 2007, Spinuzzi 2007) emphasizes the role of technical communicators in cross-functional team processes and not necessarily in diverse cultural contexts. These studies also tend to emphasize collaborative writing processes within organizations (see Kastman-Breuch 2008) rather than the more intercultural communication processes of innovation diffusion.

transfers (diffusions)" (145) and argues that technical communicators must develop their intercultural skills if they are to reach beyond the standard job descriptions of usability specialists or documentation developers and function in more of a diffusion-oriented capacity (145). He offers little explanation, however, of the specific intercultural skills needed by technical communicators engaged in diffusion processes. George Hayhoe (2007) also emphasizes the importance of expanding our understanding of global technical communication by arguing that it "is vital for the continued success of our companies and our profession" (141). Although much is known about the function of technical communication in shaping how technologies are framed and finally understood by specific social systems, as Hayhoe's point suggests, considerably less is known about the actual influences technical communicators have in the diffusion of innovations across cultures.

Culture and Innovation Diffusion

Without question, culture is an "imperative…in understanding business interactions" (Beamer 460) such as those that occur during organizational diffusion processes. Rogers' discussion of culture focuses primarily in the area of potential technological consequences, arguing that "consequences should be judged as to their functionality in terms of the user's culture, without imposing outsider's normative beliefs about the needs of the client system" (441). He provides numerous anecdotal

descriptions of culture differences during cross-cultural diffusion and acknowledges that "the innovation-decision process may be somewhat culture-bound" (179); however, his theory does little to unpack the intricate influences of the culture(s) in which the diffusions take place. In a study of the global diffusion of interactive networks, Carleen Maitland (1999) notes that diffusion research tends not to explain "the relationships between cultural variables and network diffusion processes" (342). According to Maitland, studies of technology and culture tend to emphasize either "the point at which the innovation is created" (343), or at the other end of the spectrum, "the mechanisms through which technology affects culture" (343). Using multiple theoretical perspectives (e.g. Rogers, Hofstede, and Markus, to name a few), she offers five propositions[47] linking diffusion theory to cultural theory in an effort to better "quantify the impact cultural variables have on network diffusion" (355). Although Maitland's framework is designed specifically for examining the massive global diffusions of interactive networks, such as the internet, it points to the need for a more thorough examination of the relationship between culture and diffusion processes, particularly during the pivotal activity of making a decision whether or not to adopt an innovative technology.

Despite the fact that specific "cultural factors" typically have not been included in the broader diffusion research (Maitland and Bauer 87), scholars across multiple

[47] Maitland's five propositions are as follows: 1) The diffusion rate of an interactive network will be higher in weak uncertainty avoidance cultures, 2) The diffusion rate of an interactive network whose adoption confers status on an individual will be affected by a nation's power distance, 3) Diffusion of interactive networks will be more rapid in countries with higher levels of gender equality, 4) Diffusion of interactive networks will be higher in high power distance countries, 5) Cultures low in ethnocentrism will begin diffusion of interactive networks before ethnocentric cultures (Maitland 351-354).

disciplines are increasingly exploring the interactive and iterative complexities of culture in diffusion processes within organizations and wider social systems (see Williams and Gibson 1990; Strang and Meyer 1994; Kaye and Little 1996). Susan Scott-Stevens (1987), one of the earlier scholars to emphasize the nuance of cultural context, examines how the "knowledge" (or software) of a technology accompanies the transfer of the technology (or hardware) itself. In her study of foreign consultants and technology transfer, she notes that "the most widely held presumption is that the 'idea' parts of a technological package will be transmitted simultaneously and often unconsciously along with the 'objects'" (8). She argues that "an insistence on the transfer of knowledge by recipients or an awareness that 'ideas' and 'things' go hand-in-hand does little good if there is not an equal awareness of the facilitating or constraining factors which inhibit the transfer of the entire technological package" (2). Scott-Stevens identifies culture as one of those 'factors' and argues that "what ultimately makes 'sense' to people in a culture-contact situation, linguistically and otherwise, is culturally determined and heavily dependent on context overall" (21). The importance of culture during the communication of a new idea is corroborated by Linda Beamer's (1999) point that "the very notion of 'effective communication' is culturally defined" (458). Noting the interconnectedness of culture and communication, Scott-Stevens goes on to explain that communication during technology diffusion requires an awareness of both cultural influences and "the fact that there is more than one kind of 'knowledge" (25). In other words, awareness of effective communication modes and what it takes to reduce uncertainty in the diffusion of

innovations is enhanced by a deeper, contextual understanding of intercultural communication. Prominent interculturalist, Geert Hofstede (1991), supports the concept of multiple knowledges in communication about technology and claims that intercultural technology transfer is more productive when the donor contributes technical know-how and the receiver contributes "cultural know-how about the context in which the technical know-how should be applied" (221). In other words there is a reciprocal flow of culturally influenced knowledge communicated between the implementer and user of a new technology.

Given that culture concerns "many disciplines, such as history, linguistics, literature, anthropology, sociology, psychology, and more recently economics, business, and management science with all their different approaches and methodology" (Ulijn 328), a conclusive definition of culture as it relates to diffusion is virtually impossible to determine; however, a number of esteemed scholars offer definitions that effectively characterize the multi-faceted and social nature of culture. Edward T. Hall (1976) describes culture as all-encompassing, it is "man's medium; there is not one aspect of human life that is not touched and altered by culture" (16). He views it as something that is learned, that defines the boundaries of different groups, and whose various shared facets are interrelated. Approaching culture from a communication perspective, Gudykunst and Kim (2003) assert that "our cultures influence our communication and that our communication influences our cultures" (17). Expanding on this reciprocity of influence, Jelinek (1983) claims that "culture – another word for social reality – is both

product and process, the shaper of human interaction and the outcome of it, continually created and recreated by people's ongoing interactions" (331). Central to this conceptualization is that in telling us "how to communicate with others and how to interpret their behavior" (Gudykunst and Kim 16), culture ultimately provides its members "with implicit theories of the 'games being played'"(15) in society. Geert Hofstede (2001) provides us with one of the more concise explanations of culture, describing it as a "collective programming of the mind which distinguishes the members of one group or category of people from another" (5). He claims that "cultural programming" exists in multiple layers of society (i.e. national, regional, ethnic, religious, gender, social class) and is visibly manifest in the shared symbols, heroes, and rituals of social groups. At the core of culture are the less visible values, those shared "tendencies to prefer certain states of affairs over others" (8), such as what is seen as good versus evil or important versus not important, that are learned implicitly as we develop through childhood. According to Hofstede, such distinctions in value emphasis result in the observable, often profound differences we find between cultures. While there are literally hundreds of definitions for the term culture, the general concept can be satisfactorily addressed via the following two points: it is shared and passed on by members of a social group, and through social interaction and meaning making, it shapes how we perceive the world around us.

Because "culture is such a broad construct," Maitland (1999) suggests "that the best one can do is place boundaries on its meanings for a particular application" (344).

With this in mind, I now discuss the ways in which Hall, Gudykunst and Kim, and Hofstede inform our understanding of the intercultural factors at work in the diffusion of innovations. Edward T. Hall's seminal work *Beyond Culture* has been instrumental in raising awareness of culture's influence on how human beings interact with one another. He describes how culture operates as "a highly selective screen between man and the outside world," designating "what we pay attention to and what we ignore" (85). A particular ramification for diffusion research includes whether or not the 'screen' of a cultural perspective even allows for recognizing the introduction of an innovation, much less adopting it. Rather than ignoring or denying the "silent language of culture" in our communication processes, Hall stresses the importance of recognizing context as a way of understanding "what kind of information people from other cultures require" (xiv). One of his most influential contributions involves isolating how people in a culture orient toward one another (high and low context)[48] and the concept of time (mono and polychronic). Low context cultures tend to be more explicit in their communication, place responsibility with the individual, and change easily and rapidly. In contrast, high context cultures tend to rely on implicit meanings when communicating, place responsibility with those in authority, and are slow to change. In terms of time orientation, monochronic cultures tend toward a linear, compartmentalized view where

[48] The validity of Hall's theory of cultural context, the most frequently used theory in intercultural business and technical communication literature between 1990 and 2006, has recently fallen under scrutiny. According to Cardon (2008), Hall "never mentioned his method for developing his model… [and] did not describe how he conceptualized or measured [his] rankings" (402). Cardon argues that "researchers should consider contexting to be a non-rigorously developed model without empirical support," and it should not be used "as an explanatory mechanism for cultural differences" (423).

time is a tangible that can be saved, given, or wasted. Polychronic cultures are comfortable with many things happening at once where time is circular and of less tangible importance. A culture's degree of context and orientation toward time could have a potentially profound effect on both the perspective of an innovation's promoter or change agent and its potential adopters.

In a study of how national culture differences can influence innovation diffusion, Roland Kaye and Stephen Little (1996) identify "technocratic rationality" as the dominant paradigm in the diffusion of western oriented technologies toward less developed, often eastern societies. In keeping with the sequential time orientation of a more monochronic west, the technocratic frame assumes the diffusion of western technologies is a "rational and inevitable process" that is ultimately desirable (42) and displays little to no regard for the orientation of the receiving culture, even if its eastern, more polychronic approach is at odds with the relentlessly fast pace of the technology expansion. Additionally, western technologies tend to be developed in traditionally low context cultures, consequently the design likely reflects a more explicit structure than required or even desired by a high context receiving culture. Kaye and Little point out that culture can be further complicated by an increase in "intre-organizational" (48) or within organization culture differences in addition to across organization differences. In arguing for "cultural interoperability" (52) during innovation diffusion, which can be described as the mapping of innovations onto extant culture assumptions, Kaye and

Little speak directly to the influence of cultural assumptions about time and contextual meaning on innovation diffusion.

Gudykunst and Kim's in-depth examination of intercultural communication as "a transactional, symbolic process involving the attribution of meaning between people from different cultures" (17) offers insight into the complex exchanges involved in the communication element of the diffusion process. They theorize that culture differences evoke the concept of "stranger" when communicating with someone of a different culture. It is therefore a lack of familiarity with the "other," or person outside your own group, that leads to uncertainty and anxiety in intercultural situations. They posit that in an effort to reduce stranger uncertainty, people are motivated to solicit more information; in other words, they seek more familiarity with the person from a different culture. Arguing that "we must be cognitively aware of our communication if we are to overcome our tendencies to interpret strangers' behavior on the basis of our own frames of reference (or cultural norms)" (285), Gudykunst and Kim assert that "being mindful" in our management of uncertainty is "the single most important skill" (287) in resolving the anxiety that accompanies communicating with strangers. Scott-Stevens addresses the importance of context in resolving the uncertainties of intercultural communication during technology transfer in claiming that, "inherently cross-cultural interactions, and subsequently the effective transfer of technical knowledge, are ambiguous: context dependent and full of apparent discrepancies" (140). In other words, awareness of effective communication modes and what it takes to reduce uncertainty in the diffusion of

innovations is enhanced by a deeper, contextual understanding of intercultural communication.

Geert Hofstede's theory of culture, specifically his dimensions of Power Distance and Uncertainty Avoidance are particularly salient at this point in the discussion. According to Hofstede (2001), "Power Distance is a measure of the interpersonal power or influence between boss and subordinate as perceived by the less powerful of the two" (p. 83). Cultures higher in this dimension are more apt to accept formal hierarchies, centralized government and unequal distribution of wealth, and tend to be more static and unchanging. In contrast, those cultures lower in Power Distance tend to be less tolerant of hierarchy, have a representative form of government, and are driven by the changes of technological momentum. A culture's level of Power Distance has the potential to impact the diffusion of innovation in multiple ways. For example, members of a society high in Power Distance may be more inclined than lower Power Distance cultures to adhere to the "authority" of opinion leaders during the diffusion, making the role of opinion leader that much more important to process. Another area Power Distance might impact is a social group's willingness to accept the inevitable changes brought about by a new technology. While low Power Distance cultures are more apt to accept (perhaps even welcome) the changes instigated by technology, more traditionally structured, high Power Distance societies may be resistant to accommodating a disruptive innovation. Similar to Power Distance, Uncertainty Avoidance asserts pressure on a culture's willingness to change. According to Hofstede, high Uncertainty Avoidance does not

measure risk avoidance, rather it indicates a desire to avoid that which is unknown. Therefore, high Uncertainty Avoidance cultures show a preference for clear rules, structure and government intervention to make the future less uncertain. Cultures low in Uncertainty Avoidance, in contrast, live day to day with fewer regulations and less concern about what the future has in store. A culture's level of uncertainty can have a tremendous impact on how receptive it will be to technological change. If the people in a social system perceive the innovation as "wildly" new and not directly applicable to their current situations, they may not even consider introducing the uncertain technology into their lives.

Hofstede acknowledges the powerful affect technological innovations can have on social systems and points specifically to the need for culture change in certain cases if an innovation is to be adopted. He states, "technologies presuppose values that (often) run counter to local traditions (i.e. 3rd world countries)…In this case the local culture has to be changed (and this) calls for a conscious strategy based on insight into the local culture" (442). To exemplify how difficult changing some of the cultural dimensions can be, however, he underscores that differences in Uncertainty Avoidance between cultures are typically more difficult to manage than differences in Power Distance. Despite his acknowledgment that "change comes from the outside in the form of forces of nature or forces of human beings: trade, conquest, economical or political dominance, and technological breakthroughs" (34), he also believes the function of communication technologies is "culturally determined" (453) and sees no reason why "economic and

technological evolution should suppress cultural variety" (30). Far from merging into a unified, worldwide culture, Hofstede asserts that the differences between social systems will continue to influence, and be influenced by, the diffusion of innovations.

In the years since Hofstede's influential work, a number of scholars have explored the impact of national-level culture difference and have affirmed the importance of matching cultural assumptions during innovation diffusion (Strang and Meyer 1994, Kay and Little 1996). Stating specifically "that diffusion may be importantly shaped and accelerated by culturally theorized understandings of the nature of social actors and of diffusing practices" (100), Strang and Meyer argue that understandings of diffusion processes "will go astray if they are not made conditional on the larger cultural context" (109), which includes national culture. In his examination of space-based technology transfer, Ryan (2004) affirms the role of national culture in understanding "the effectiveness of technology transfers across nations" (35) and asserts that "organizational traditions and structures under which technology transfers are likely to occur are clearly linked to the [national] culture that underlies that organization" (38). In other words, an understanding of national culture differences is significant in the study of innovation diffusion processes. Yet Constantides (2001) reminds us that "organizations are defined and constrained by both external (national or disciplinary) and internal (organizational) cultures" (33). According to Corbitt (2004), "many political boundaries defining a National State fail to represent actual cultural boundaries; a single National Culture does not reflect the true cultural beliefs" (66) of organizations or individuals. Indeed, noted

technology transfer scholars Williams and Gibson (1990) emphasize the "identifiable range of interpersonal, technological, organizational, and environmental variables" (170) integral to the process. While their discussion of culture itself is limited to varying communication practices among different culture groups, which typically are identified as more powerful donors and less powerful recipients, such as US multinational firms and newly developing countries, Williams and Gibson focus our attention on the concept of organizational culture differences as a potential "barrier to communication" during innovation diffusion (13). This re-focusing of culture from broader national or regional contexts to more specific organizational communication practices brings greater depth to Rogers' limited discussion of culture in organizational diffusion as "informal practices, norms, and social relationships" (404).

Expanding on the importance of organizational culture, Patricia Carlson (2001) examines organizational change during information technology implementation. She posits that workplaces increasingly "put communication, culture, and collaboration at the center of work" (77) and that successful technology adoption requires attention to these elements contributing to the organizational context" (79). She argues that innovation diffusions fail when the changes they bring about disrupt the social systems equilibrium often by conflicting with the organization's "deeply embedded values" (85) or culture. Because changes brought about by the implementation of new technologies might "in the worst case…be looked upon as a threat to job security" (86), Carlson suggests that members of an organization "are most comfortable when operating within a structure that

includes clear and reasonable expectations, proven routines/methods for accomplishing tasks, and reasonable and predictable rewards" (87). In other words, negative reactions to an innovation might reflect more of a resistance to the disruption of organizational culture than to the innovation itself. While our current understanding of organizational culture rests primarily in the fields of "sociology, anthropology, social psychology, and economincs" (Carlson 85), the field of technical communication is beginning to wrestle with how best to incorporate concepts of culture in our explorations of innovation diffusion. For example, Lovitt (1999) questions which 'culture' to examine in professional discourse practices when he asks, "Is it the culture of organizations and institutions? Of discourse communities? Of localities and regions? Of ethnic groups and antions?" (3). Lovitt is not suggesting that national culture has no role in international professional communication; however, he claims that individuals are influenced "perhaps even primarily…by their membership in other discourse systems" (8) or "sub-cultures" (4). He goes on to argue that the more individuals interact with other culture groups, "it will become increasingly difficult to anticipate their attitudes and behaviors based on models of their native culture" (9). More recently, in a study of the rhetoric of technology transfer among technical communicators in U.S.-Mexico Border Maquilas, Barry Thatcher (2006) notes that in international settings, "technologies do not relate to or fit each cultural and rhetorical tradition in the same way" (383). Rather than point just to a specific level of culture (national or organizational) for explanation, Thatcher identifies the "co-constructive relationships" (383) among the varying actors and contexts

in intercultural technology transfer. According to Thatcher, the relationships constituting these "cultural systems exemplify and reinforce different rhetorical traditions that significantly influence the teaching and integration of new technologies" (387). Thatcher suggests that more "viable theories of intercultural professional communication" (467) could be constructed by first "starting with the larger [national] cultural patterns and then moving to the organizational and personal levels of analysis" (467). While research tends to affirm the relevance of national culture in innovation diffusion processes, a growing body of work is drawing attention to the complexity of multiple, less static cultures influencing the communication of innovations.

The relationship of culture to innovation diffusion is unduly complex, and given its inherently social and systemic nature, cannot be essentialized as a distinctly national or organizational variable. As Appadurai (2006) points out, culture defies absolute identification because "In some way, all things are congealed moments in a longer social trajectory" (15) that is constantly evolving. We are living in "a world of flows" where objects made up of "ideas and ideologies, people and goods, images and messages, technologies and techniques" (Appadurai 2000, 5) are in constant motion. In other words, culture might be captured in identifiable moments, but it is nonetheless a fluid and changeable phenomenon influenced by a myriad of variables. Considering this more fluid view of culture, Appadurai asks us to re-evaluate how culture is described: "If *culture* as a noun seems to carry associations with some sort of substance [object or thing] in ways that appear to conceal more than they reveal, *cultural* the adjective moves

one into a realm of differences, contrasts, and comparisons that are more helpful…context-sensitive" (1996 12). According to Appadurai, examining the culture of a nation-state only makes sense when it is viewed as part of a broader system (19); therefore, shifting to the *cultural* suggests a comparative dimension which "orients us to the idea of culture as difference, especially difference in the realm of group identity" (15). In keeping with this perspective, Hunsiger (2006) calls for a more individual understanding of cultural identity whereby the intertextual complexities of culture, such as those extra-cultural elements "integrally rooted in [broader] economic, political, and historical contexts" (37), are taken into account when considering the culture of individuals. Selzer (1993) describes intertextuality as every text incorporating "within itself an intersection, a dialogue, a network among writers and readers and other texts" (173) and claims the role of the researcher "is to uncover the various resonances inscribed in the tapestry of text and to account for their source, their intricacy, their meaning" (179). Whether research emphasizes technical writing or broader functions of technical communicators, Hunsiger argues that an intertextual approach offers greater depth to our understanding of what constitutes culture and how it then influences technical communication processes.

Having recognized that a stable view of culture "has become increasingly untenable" in an increasingly interconnected, "borderless world"(9), Lovitt argues for a process-oriented view of the intercultural communicative contexts in which professional (or technical) communicators function. Indeed, scholars are beginning to expand their

view of culture in technical communication. Embracing the value of a more process-oriented approach to studying culture in the age of globalization, Wang (2008) encourages the application of a critical perspective to our understanding of cross-cultural interactions in technical communication. He argues that because social contexts are continuously changing, culture should not be viewed "simply as a received pattern of thoughts, actions, values, beliefs, or artifacts, but rather as an ongoing active process to create and reshape" (138). Using a process perspective, "culture always takes on new meanings through a group's constant constructing of social reality in social interactions" (138) that results in a stretching of "the boundaries of social interaction so that a webbed connection of social contexts of various cultures is formed across the globe" (Wang 138). Wang acknowledges that a more critical, process notion of culture continues to be "difficult to conceptualize or describe" (138); however, he argues that it is necessary "to avoid the common stereotypes and simplified ways of labeling cultures and thus better address the complex situations confronting [technical communicators] in the new era" (138). Stressing the criticality of the global economy, Clay Spinuzzi (2007) argues that technical communicator's are uniquely qualified to attend to the "interpenetrations" of the increasingly intercultural workplace involving more and varied communication "and consequently more need for rhetorical analysis and rhetorical skill" (266) of the technical communicator. The interpenetrations that technical communicators navigate for meaning during innovation diffusion processes involve the reciprocal influences of technology and a webbed complexity of social and cultural factors. Using this more fluid, interconnected

schema for visualizing the interplay of technology and culture during innovation diffusion suggests that the model of technical communicator as a conduit or "bridge" between an innovation and user is too linear and one-directional to capture the myriad of intertwining influences in innovation decision processes. Indeed, the research infers that using a more critical, intertextual perspective in the study of culture invites a greater understanding of the reciprocal influences of technical communication and the shifting currents of globalization; as a result, scholars are addressing the complex interrelationships of culture, communication, and innovation in global organizations.

One notable area of scholarship comes out of the Open University in the Netherlands (OpenUniversiteitNederland). Jan Ulijn (2000), prominent scholar of international entrepreneurship, innovation, and culture, makes it clear that "technical (and scientific) communication is increasingly becoming a matter of culture of all kind" (320). He points out that multiple cultures (e.g. national, corporate, professional) must be taken into account during innovation diffusion because "differences in socioinstitutional settings lead actors to perceive and interpret information (technical or otherwise) in different ways" (321). In other words, implementation might be delayed or impeded by the unfamiliarity of the "institutional embeddedness" (321) of the information or technology. To maximize innovativeness, Ulijn (2008) argues for an "entrepreneurship-supportive culture at the place where national, professional and corporate cultures meet" (76). Expanding on this, Arjen Verhoeff (2008) stresses the necessity of social innovation in entrepreneurial innovation processes. According to Verhoeff, technical

innovations are manmade, as opposed to biological mechanisms for survival; therefore, technology results from "cultural evolution" (53) rather than biological evolution. Verhoeff argues that technical innovation cannot happen without innovation within the social system itself and points to the necessity of fostering "a trustful entrepreneurial climate, a stimulating corporate culture and innovative behavior" (53) when implementing new technologies. Ulijn (2000) does not discount the more traditional, heuristic models (such as Hofstede's work) for studying socioinstitutional cultures; however, he argues that these approaches are "based upon only one layer of the onion: the values of the respondents regarding how do they see themselves reacting in management situations" (329). He points out that additional cultural factors, such as the cultural biases of the researcher and issues of translation and interpretation, further complicate intercultural, organizational research. Given the confluence of multiple variables, for example, Ulijn advises researchers collecting data in workplace environments to question if self-reporting people actually do what they claim to do (329).

Agency and Innovation Diffusion

A conceptualization of culture that considers the more nuanced (and often power laden) implications of the less tangible variables Ulijn alludes to can be found in cultural studies scholarship. In their text *Critical Power Tools* in which they articulate the value of a cultural studies approach in technical communication, Blake, Longo, and Wills

(2006) note that the majority of research in technical communication has tended to be "hyperpragmatic" in that it "value[s] accommodation and conformity (to conventions, practices, and values) ahead of critique" (10). These authors claim that the more practical, socialconstructionist traditions of technical communication scholarship have enabled us to "account for the conventions and values of discourse communities" (10) by emphasizing "rhetorical and organizational effectiveness and productivity" (10); however, it has not done enough to allow for "cultural critique and ethical intervention" (10) in those communities. They elaborate this point by arguing that "recognizing the social dimension of technical communication is a starting point but can stop short of understanding technical communication as part of power/knowledge formations that include ideologies, institutional constraints, economic pressures, and other cultural forces" (12). Mark Zachry (2007) notes that the trend from a more social to a more cultural approach in communication studies has created a space for "nonessentialized conceptions…to account for how language and other practices function in human experience" (viii). He goes on to assert that "this turn toward the cultural perspective allows researchers greater opportunity to consider the contingent and always unpredictable play of such factors as gender, ideology, and history…[toward] new ways of conceptualizing communicative practices" (viii). Similarly, Bernadette Longo (2000), argues in her influential history of technical writing and the management of science, *Spurious Coin*, that culture studies offers technical communication scholars an expanded understanding of culture that incorporates concepts of "power, politics, ethics, and

cultural tensions to our understandings of what it is we do when we communicate" (69). In the quest "to interrogate …[the] values, functions, and effects" (Scott, Longo, Wills 12) of technical communication, then, cultural studies reminds us of the broader ideologies and power structures of the various cultural contexts in which technical communicators function.

Alan Nadel (2006) points to the necessity of bringing greater depth to our examinations of organizational culture and its effect on individuals operating within it in his forwarding remarks in *Critical Power Tools,* by asserting that "legitimation of an institution is the result not of inherent value but of a continuous struggle for the control and distribution of meaning" (xi). Similarly, Britt (2006) argues that institutional cultures are rhetorically constituted through the actions of rhetorical agents (137). Highlighting this constitutive agency, Nadel suggests that "since authority [within cultures] not only requires but creates subjects, cultural studies examines the array of subject positions from which cultural meanings are constructed and construed" (xi). In other words, multiple and often hidden elements of culture, including who has authority or agency in a given context, can have a profound influence on which knowledge or meaning gets legitimized within a social system. The concept of who has agency in legitimizing knowledge is particularly salient when considering the implementation of a new, previously undefined technology. For example, Klein notes the influence of agency among those championing an innovation in "that technologies progress from elite to universal forms as a result of the agency of those seeking to promote it" (14). In contrast, Zachry points out the

potential influence from a lack of individual agency in terms of speech self-regulation, conformity to organizational norms, and "individuals tacitly agreeing to suppress…opinions to avoid conflicts that could jeopardize their jobs" (vi). Cultural studies, then, provides the critical lens for "assessing [such] subject-related effects of power" (Scott, Longo, and Wills 14), particularly in terms of technical communicators and the users they potentially influence

In identifying technical communicators as critical agents at the rhetorical junctures of innovation diffusion, Doheny-Farina and others attribute a degree of agency to their participation in the process. Given the multiple tensions of meaning making that envelop the introduction of a new technology within an organization, however, it is often unclear which individuals within the social system ultimately have the power or authority to shape (or contest) the meaning that emerges. The essential question, then, is what generates agency and with whom does it lie during innovation diffusion? Grabill (2006) claims that "this problem of agency is the problem of acting within systems of decision-making marked by organizational, epistemological, and discursive complexity" (159) and that much might be learned through research that embraces the performative nature of "a rhetoric of culture" (158). He argues that this more complex view of culture opens a space "at the point at which the rhetorical study of cultures and institutions meet…[that] neither cultural studies scholars nor technical and professional writing researchers visit much" (156). Dorothy Winsor (2006), who defines agency as "the intent and capacity to make something happen" (417) peers into this rhetorical space in her work examining

how writing structures agency among engineers. Looking specifically at a culture of writing (that of engineers) within the confines of organizational structures, Winsor notes the necessary interplay between intentionality and agency. She argues that "individuals experience intent as something that they originate, but they do not originate it from nothing" (416) and that "organizational structures and personal dispositions [come] together to create a place for rhetorical agency" (421). According to Winsor, therefore, agency as it applies to technical communication is a "conjunction of opportunities" (427) involving both individual intentions and contextual structures, and it is embodied through rhetorical action.

Rhetorical agency, as such, is typically not addressed in innovation diffusion research. Roger's theory recognizes that adoption decisions vary depending on the locus of agency in an organization, whether it's a voluntary choice or a top-down mandate (Dayton 218); however, non-adoption traditionally is characterized as simple "act[s] of resistance" (Klein 3) rather than a manifestation of individual agency. Implementation failures are often discussed in terms of misaligned goals among distinctly characterized users and technology champions, with champions described as more technologically focused than the potential users (Lawless 351). Although researchers recognize that organizations consist of "networks of actors composed of complex relationships between various internal and external stakeholders" (Mantere 418), agency is typically isolated in the strategic actions of top management. Acknowledging the more complex, rhetorical link between implementer and user agency, however, Saku Mantere and John Sillince

(2007) note that objectifying organizational members during the application of strategic intent "may have serious repercussions for at least commitment and control" (414) among potential users. In other words, the tendency to identify agency only in those implementing an innovation potentially obscures the influence of user actions (or agency) on the process.

Further complicating the issue of agency in innovation diffusion is the influence the technology itself has on the process of meaning making. In an examination of extreme usability in technical communication, Bradley Dilger (2006) points to the ramifications of 'extremely' accessible (in terms of ease of use) technologies for user agency. He claims that users lose a level of control in their interactions with technology when efficiency of use is made paramount, arguing that this "increase in [technological] power shatters the power and agency of the end user, [by] concentrating expertise and knowledge in administrators and designers" (63) of the technology. Dilger goes on to argue that technical communicators should resist extreme ease of use because it actually takes power away from "user-centered processes of writing and design" (66). In addition to the potentials for agency within different organizational roles, then, technological efficiencies have the potential to influence and perhaps even diminish agency in potential users. Indeed, agency within innovation diffusion processes is difficult to isolate. Having specifically examined rhetoric, action, and agency in technological organizations, William Kinsella (2005) claims that "the locus of agency has shifted increasingly from the individual to larger systems of power/knowledge" (303). Using Burke's concept of

identification, Kinsella argues that organizational structures occur via the "rhetorical accomplishments" (307) of identification and the "persuasive linking of members' individual identities with organizational values and interests" (307). According to Kinsella, the identification principle "leaves substantial room for individual and intentional action in contexts such as leadership, control, domination, and resistance;" however, he stresses "that such action is bounded by and grounded in institutional motives that are consciously or unconsciously adopted by organizational rhetors and audiences" (307). While not focused on innovation diffusion in particular, Kinsella's work suggests that the attribution of agency with respect to technology adoption is not limited to a 'type' of user; instead, it evolves in a complex reciprocation of individual and organizational rhetorical identifications. Innovation diffusion research tends to lack this more rhetorical, contextually dependent perception of agency that manifests among users and change agents when organizations actively implement innovations.

Identifying the Research Questions

As this review of the literature has demonstrated, the majority of diffusion scholarship centers on user/change agent characteristics, perceptions of technology, and institutional structures when examining why individuals choose to adopt or reject an innovation; however, this large body of research tends to emphasize "the antecedents and consequences of [technology] transfer rather than…attempt to gather an understanding of

the transfer process itself" (Klein 252). As Dayton explains, the preponderance of inquiries focusing on individual traits has limited our opportunities to explore the "complex web of personal, social, and technological factors, all of them mutually interdependent" (213) that comprise the adoption-decision process. Additionally, an equally abundant body of diffusion research emphasizing "techno-centric models" (Coppola 287) and characteristics has been inadequate in exploring the interpretive, socially-driven nature of how we perceive a technology's 'usefulness.' To better explain variances in innovation-decisions among users, then, attention needs to be given "to the role of social actors in the constitution and re-constitution of technologies" (Munir 1408), as well as the broader contexts influencing the meaning making surrounding the adoption-decision. And, as Doheny-Farina and others have established, the technical communicator plays a role in how such meanings are shaped.

Despite the assumed agency of technical communicators in innovation diffusion, there has been relatively little research addressing their influence on users' adoption decision processes. In addition, we are only beginning to explore the influence of culture difference on the contextual considerations of innovation diffusion. What Lovitt pointed out over a decade ago still appears to apply: There is "a lack of precision in defining the nature and extent of the relation between culture and international professional communication" (3). More specifically, an area of particular relevance to practicing technical communicators, but which lacks adequate research attention, is the interrelationship of communication, culture, and power in innovation diffusion processes.

In arguing for more of a cultural studies approach to such issues, Beverly Sauer (2006) notes that "Cultural studies of technical communication can reveal the underlying contexts that give meaning to the notions of certainty and uncertainty at specific moments in history" (177). According to Grabill, "researchers in technical and professional writing are well-positioned to address deep problems of rhetorical agency, and to address them in precise ways within a range of situated institutional contexts" (151). In other words, the cultural studies perspective invites an exploration of the more complex influences on innovation diffusion that are often neglected in traditional research approaches.

Although there is a wealth of diffusion research across diverse fields of study, actual innovation implementations within global organizations "continue to falter, leading researchers to the realization that there is a need to further develop our theoretical appreciation of this complex process" (Munir 1404). Indeed, Frederick Steier (1999) emphasizes that "the development of intercultural understanding is not only a theoretical concern for researchers, but also a challenge to practitioners. It is at this juncture between theory and practice that intercultural understanding becomes a critical concern for professional communication" (160). Despite the growing body of knowledge, Andrew Sturdy (2004) argues that traditional approaches to innovation diffusion research "fail to provide sufficient insight into the ongoing processes through which ideas, practices and other actors are produced, adopted, negotiated, translated, abandoned and/or rejected" (171). To that end, Jane Perkins (1999) has called for more "ethnographic

studies of global, multicultural workplaces" (25) where researchers "tell and retell small stories of communication – not of boundaries but of interplay and repertoire building" (22). The implementation of ASAPS across three unique yet interconnected cultures presents an opportunity to tell just such a story. Before articulating the research questions framing my examination of this story, however, I will clarify how I situate the inquiry.

As discussed in chapter 2, it should not be assumed that the point at which the users (writers and translators) began using ASAPS was when they fully adopted or supported its implementation. In light of this, the diffusion of ASAPS was not necessarily complete, in terms of full support for the system as the best choice among all of the available tools, simply because everyone in a position to use the system was using it. While it appeared that ASAPS was implemented to some degree via the optional innovation-decision approach and that individuals only began using it when they were convinced it was the best choice, such assumptions stifle exploration of more nuanced and complex influences on adoption-decision processes among the writers and translators who eventually used ASAPS. This raises the following questions about the ASAPS diffusion: To what degree did individuals feel empowered to come to their own conclusions about the innovation? How did relationships among people within the organization or social system, particularly among potential users and the members of the ASAPS Development Team, influence the decision-making? And given the three locations of implementation, what influence did different cultural contexts have on the

process? While any number of elements might be explored in innovation diffusion processes, what remains underdeveloped in our knowledge of how individuals perceive and ultimately respond to innovations are the less tangible factors of culture, agency, and relationships among users and implementers that these questions raise.

To summarize, much of what we know today about technology transfer focuses on the development and successful delivery or diffusion of innovative technologies, with specific attention paid to individual characteristics compelling adoption and the impact of adoption on both the technology itself and the wider social system. Considerably less is known about the rhetorical nature of adoption-decision processes, particularly as they relate to intercultural communication and the socio-cultural contexts in which the adoptions (or rejections) take place. Additionally, we know relatively little about the ways in which technical communicators contribute to these processes. Research in these areas is warranted if we are to understand and effectively adapt to the intercultural complexities of innovation diffusion in the era of globally distributed work.

Expanding our understanding of the complex influences on the full adoption of an innovation (as opposed to simply using it or outright rejecting it) requires a focused, in-depth examination of adoption-decision processes, and the ASAPS case provides an opportunity for just such an exploration. This inquiry, therefore, is guided by the following research questions:

1. How did socio-cultural context and agency influence the adoption-decision process among technical communicators and translators?

2. In what ways did the technical communicators on the Development Team influence the adoption decision process? What were their roles and/or functions during the process?

CHAPTER 4: Theoretical Rationale

The adoption of innovations and new technologies traditionally has been studied as a "one-way and top-down" (Sturdy 171) process. Using this vantage point, management or those higher in the organizational hierarchy, tend to initiate the innovative change that then diffuses down toward potential users who are lower in the hierarchical structure. Research applying this one-directional view of diffusion tends to emphasize the static, facilitative aspects of the adoption process (Munir 1421) and limits or wholly neglects "the ongoing processes through which ideas, practices and other actors are produced, adopted, negotiated, translated, abandoned and/or rejected" (Sturdy 171). In other words, linear theoretical approaches do not adequately allow for the broader examination of such complexities as collaborative activities, individual perceptions of agency and the social and cultural milieu influencing the adoption decision process. Given that "there is no limitation to where information for the transfer process can be found" (Klein 252), Dayton (2006) asserts that "repeated patterns of setting, character, and plot can be easily discerned, along with a limited variety of themes" (360) in technology adoption. He argues that organizing and defining the "thematic patterns" in innovation adoption requires a flexible and accessible analytical framework that traditional, point-to-point theories cannot address when used alone (360). To allow for a deeper and more systematic exploration of the innovation-decision process, Dayton proposes bringing the heuristic concepts of applicable theories together in a blended "hybrid" model (362). Moreover, combining complementary and contrastive

perspectives in theoretical triangulation is useful for illuminating alternate dimensions, producing greater insights, and drawing additional connections among the areas of analysis (Denzin and Lincoln 2003, Dayton, 2006). For a more thorough examination of the ASAPS adoption decision processes than a singular theory would allow, therefore, this study applies a blended theoretical approach based on Dayton's (2006) Hybrid Analytical Framework (HAF) which incorporates the following theoretical approaches: Rogers' adoption and diffusion theory (ADT), Engeström's cultural-historical activity theory (CHAT), and the social construction of technology (SCOT). Strengthening the rationale for using HAF as the theoretical starting point for this study is the fact that a number of features in Dayton's work correspond with elements in the ASAPS case (both involve groups of technical communicators and the adoption of single source content management systems). What follows is an overview of the relevant theories in Dayton's model and an explanation of how it has been adapted and expanded to address the specific research questions in this project.

Rogers' Diffusion of Innovations Theory

Everett Rogers' theory of innovation diffusion is foundational to our understanding of technology transfer processes and for decades has been instrumental in organizing the often complex story of why and how innovations are adopted – or not. Prior to Rogers, technology transfer research was distinctly segregated across multiple

fields of study (i.e. economics, education, sociology) and lacked the coherency of a "unified, cross-disciplinary viewpoint" (Rogers 2003, 40). In the early 1960's, Rogers shifted the research emphasis from the unidirectional concept of transference to the more social concept of communication processes. His re-conceptualization of technology transfer, viewing the adoption process as creative reinvention rather than invariant implementation (Rogers 71), led to the phrase 'diffusion of innovations' rather than technology transfer and pulled the various, multidisciplinary approaches together under a general, more uniform research model.[49] According to Dayton, Rogers provides us with an explanatory vocabulary of the key roles and structured stages in both the broader diffusion process and the more specific adoption decision process at the center of this study.

Rogers' views innovation diffusion as a special type of communication concerned with "overt behavior change (in the) adoption or rejection of new ideas" (2003, 13) and breaks the process down into four fundamental elements that he claims constitute all diffusion processes: 1) Innovation Characteristics, 2) Communication, 3) Time, 4) Social System. The first involves the characteristics of the innovation itself as perceived by the potential adopter, which includes the innovation's relative advantage over other options, its compatibility with established belief systems, its complexity, and whether it can be observed and used on a trial basis. The second element of diffusion involves the communication channels that allow for message exchange between individuals. Rogers

[49] While many refer to Rogers' *Diffusion of Innovations* as a single theory, Rogers refers to diffusion theory as meta-theory that combines multiple theoretical perspectives.

views interpersonal communication and relationships as the most influential factors in the decision to adopt or reject an innovation. The third element is the length of time it takes for an innovation to diffuse. Rogers refers to this as the *innovation-decision process* whereby an individual (or a decision-making unit, such as a work team) moves from first learning about an innovation to making a decision about whether to adopt or reject it. Rogers classifies adopters, or those determining whether or not to adopt or reject an innovation, by their personal level of innovativeness and how long it takes them to adopt. He offers the following five adopter categories: innovators, early adopters, early majority, late majority, and laggards. Dayton views these distinguishable roles and time-oriented steps as predictable frameworks for examining the progression of the adoption decision, particularly in the early stages of the process.

The final, and perhaps most complex, element in the diffusion process is the social system in which it occurs. Issues in the social and communication structures of the system, such as social norms, types of innovation-decisions, consequences of the decision, and roles of opinion leaders and change agents influence the diffusion processes occurring within the social system (Rogers 24). Rogers identifies two social system roles that are critical in technology diffusion – Change Agents and Opinion Leaders. Change Agents are individuals within the system who represent those promoting the innovation and who influence the adoption decision process in the desired direction. Change Agents often enlist the established social power of Opinion Leaders in their quest to promote adoption. Opinion Leaders do not necessarily hold formal leadership roles, rather they

have earned the status through "technical competence, social accessibility, and conformity to the system's norms" (Rogers 27). In exemplifying the social system's structure, Opinion Leaders model accepted norms and ultimately influence whether those in the social system will accept or reject an innovation. The process is further differentiated in terms of the following innovation-decision types within the system: the *optional choice* made by individuals independent of others[50]; *collective choice* achieved through group consensus; *authority choice* made by a few higher status individuals; *contingent choice* that is made only after a previous adoption decision has been made.

As the principle elements of Rogers' theory demonstrate, the fundamental concern of innovation diffusion is social change brought about through the communication of new ideas (6); therefore, it is particularly useful "for collecting, organizing, and analyzing opinions and observations to deepen insights into a work groups' assessment of the innovation and its impact" (Dayton 2006, 366). In other words, the specific stages and roles identified by Rogers provide a detailed and useful framework for examining the social relationships and structures among key people involved in the ASAPS adoption decision process. Rogers is not as useful, however, for conceptualizing the abstract, less apparent elements influencing the innovation's initiation, specifically the initial contextual scene in which the ASAPS adoption decision process takes shape, as well as individual degrees of agency or control in making the

[50] The ASAPS case is essentially an *optional choice* innovation-decision given that the technical writers were not required to use the new system during the timeframe being examined in this study. As previously discussed, legacy documentation and the hands-off approach of management allowed individuals to continue using the existing tools and avoid learning ASAPS

decision. To more thoroughly understand the process in its entirety, it is necessary to examine the unstructured, less visible aspects contributing to the contextual spaces in which decision making occurs. Dayton incorporates Engeström's Cultural-Historical Activity Theory (CHAT) into his hybrid model to provide the theoretical perspective necessary for examining the contextual elements influencing the earlier processes in diffusion.

Engestrom's Cultural-Historical Activity Theory

Much like technology transfer scholarship, activity theory is multidisciplinary and allows for a "broad approach" in researching the socially situated complexities of human activity (Engeström and Miettinen 8). Its roots lie in Vygotsky's cultural-historical psychology and "the idea of cultural mediation of action…commonly expressed as the triad of subject, object, and mediating artifact" (Engeström 2001, 134). Simply put, Vygotsky views individual actions as being influenced by the cultural means or artifacts of the social system, and at the same time, these actions influence the social system through the use of cultural artifacts. Vygotsky explains the interplay of physical and cultural tools (or artifacts), such as hammers, pencils, or language, and their users (or subjects) as both internalizing the existing cultural system that produced the tools and also impacting the system through deliberate activities that bring about potential modifications (Schryer 28). This interaction between the social system and material

objects of a culture is referred to as the *socio-cultural context* (Lantolf and Thorne 197). Referring to human activity as "endlessly multifaceted, mobile and rich in form" (Engeström and Miettinen 20), Engeström (1999) emphasizes the value of activity theory for taking into account "the constitutive elements of the system under investigation" and argues that "the internal tensions and contradictions of a system are the motive force of change and development" (9). He furthers Vygotsky's work by pointing out that activity systems do not operate in isolation; rather, society is made up of "multilayered network(s) of interconnected activity systems" (36). To more fully examine the contextual complexities in such interconnections, Engeström expands Vygotsky's triad of subject, object, and mediating artifact in a third generation model (see figure 1 below) that includes the less visible social mediators of activity: rules, divisions of labor, and community. According to Engeström, activity therefore involves expansive cycles of ongoing interactions (Object 1 to Object 2 below), contradictions, and ultimately, transformations (Object 3 below) in which "developmental transformations are seen as attempts to reorganize, or re-mediate, the activity system in order to resolve its pressing inner contradictions" (Engeström 2001, 67).

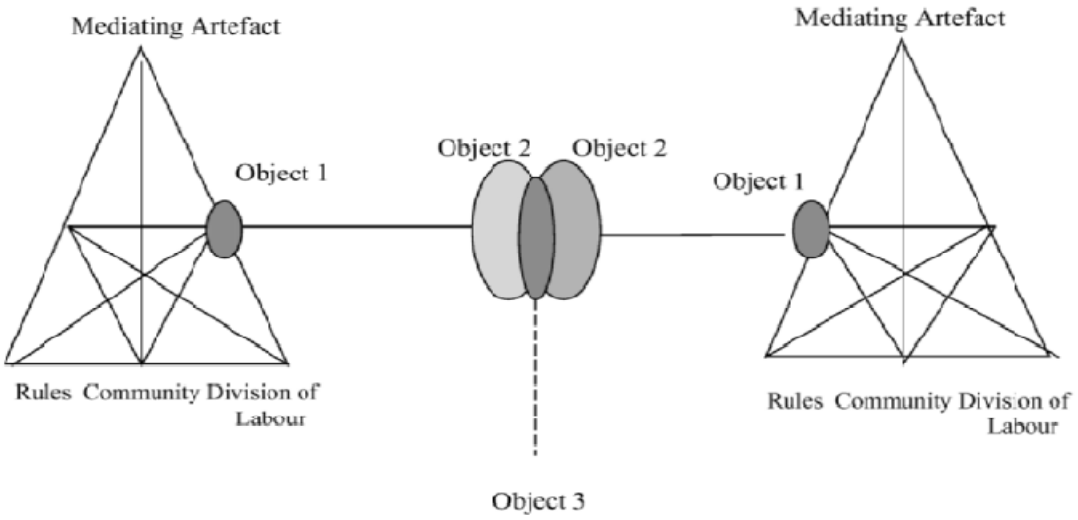

Figure 1: Engeström's minimal model for the third generation of activity theory (2001, p. 136)

Applying the CHAT perspective to the ASAPS case allows for uncovering the various and often hidden tensions within and between individuals, as well as among the unique locations where ASAPS was implemented. While it may be inadequate for examining the overarching and often tangential issues that lie beyond the parameters of Engeström's conceptualization of an activity system, CHAT is useful for examining adoption influencers within the context of organizational innovation diffusion because it incorporates the complex socio-cultural factors at play in interconnected activity systems. Dayton includes CHAT in his hybrid model to more thoroughly map the contextual elements in the diffusion process and to "seek out and explain the internal contradictions and socio-cognitive dissonance embedded in collaborative work practices" (2006, 363). In this case study, it allows for unpacking the multiple scenes (Minnesota, Gelderland,

and Limberg) in which perspectives about the object of the activity (ASAPS), as well as perceptions of agency, ultimately are mediated. According to Dayton, CHAT also identifies motive as "the key stabilizing feature of every activity system" in that it "situates the subject [in this case the eventual adopters of ASAPS] intentionally with regard to the object [ASAPS]" (363). While this study does not endeavor to isolate specific motives for adoption, it explores potential influencers, such as perceptions of choice, on the motivation to adopt. Using CHAT to examine variables of socio-cultural context and agency furthers our understanding of what might be impacting the stabilizing yet elusive concept of motive in the adoption decision process. As Kain and Wardle (2005) point out:

> "By examining the relationships and interactions among subjects, tools, and motives and the ways that the social basis of the system shapes individual actions, we can better understand how individuals perceive activity and operate in contexts and explain why individuals are motivated to learn and use particular tools. We can also evaluate when and why elements of activity systems conflict, causing what activity theorists refer to as contradictions or failures in activity that interfere with realization of individuals and communities' goals" (122)

Combining the theoretical orientations of both CHAT and Rogers allows for a more thorough analysis of both the initiation and implementation aspects of diffusion. It

provides a lens for examining the ASAPS' adoption process from its first introduction to its eventual adoption by the users in each activity system. CHAT sets the stage by exposing the socio-cultural factors surrounding the activity of transitioning to ASAPS while Rogers unfolds the "paradigmatic plot" in the process (Dayton 2006, 366). While the combination of these theories effectively addresses the social roles and contextual influences in innovation adoption, as well as the role of individual agency and initiative on these transformative activities, they do not adequately explore the possible influences of culture differences within and among the activity systems. It is at this point that the theoretical framework for this study diverges from Dayton's hybrid model.[51]

Hofstede's Theory of Cultural Dimensions

An examination of the different cultures contributing to the socio-cultural context at the center of this study is complicated by the lack of consensus among intercultural scholars on what the term 'culture' actually means (Lovitt 1999, Maznevski et. al. 2002, Cooper 2007, Wang 2008). In particular, innovation diffusion processes typically involve issues of culture difference, yet the scholarship lacks a unifying theoretical

[51] The third aspect of Dayton's framework uses social construction of technology (SCOT) theory to examine the ways in which work groups interpret and give meaning to new technologies; however, SCOT is not applicable to this case for two reasons. First, for SCOT to capture the "interpretive drama" as it unfolds in work groups, it is necessary to engage in real-time participant observation of the communication processes (Dayton, 2006, 366). Given that this is a historical case, it is not possible to conduct the real-time, ethnographic analysis required by SCOT. Second, this study focuses more on the participants' perceptions of the diffusion process as a whole and less on their perceptions of the technology itself, which is the emphasis of SCOT.

perspective of culture. As noted intercultural communication scholar William Gudykunst (2004) points out, however, theoretical analyses involving culture should be guided by a focused, clearly articulated understanding of what culture is (41). Nonetheless, Hofstede (1983) notes the difficulty in incorporating the many conceptualizations of what culture means when "there is no commonly accepted language to describe such a complex thing as "culture" (77). He therefore offers a succinct definition of culture that draws on multiple, cross-disciplinary perspectives, making it particularly applicable in the analysis of innovation diffusion processes.[52] His definition of culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another" (9) emphasizes the unifying factors in human collectives that set groups apart from one another. This definition assumes people can be characterized as belonging to particular culture groups which share identifiable culture patterns or features. While Hofstede's work emphasizes the influence of national and regional culture differences in organizations, he points out that identifiable patterns or programming exist in multiple layers of society (i.e. national, regional, ethnic, religious, gender, social class), and are visibly manifest in the shared symbols, heroes, and rituals of the collective. Therefore, the study of culture requires "a dynamic, multi-layer approach" (Corbitt 67) to understanding how individuals are 'programmed.' Such programming,

[52] Specifically, Hofstede draws on the following perspectives in his "shorthand definition" (9): "Culture consists in patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts" (Kluckhohn, 1951, 86); Culture "is transmitted and created content and patterns of values, ideas, and other symbolic-meaningful systems as factors in the shaping of human behavior and the artifacts produced through behavior" (Kroeber and Parsons, 1958, 583); Subjective culture is "a cultural group's characteristic way of perceiving the man-made part of its environment" (Triandis, 1972, 4).

which is values-based and learned implicitly as a result of living and participating in a particular culture group, informs how we perceive and respond to experiences. Hofstede (1991) claims that the profound differences we often find among cultures result from distinctions in values emphasis which affect collective behavior and tend to persist over time.

Hofstede's (2001) iconic work offers a useful, time-tested heuristic for identifying and comparing the national and regional cultures within the activity systems at the center of this study. Developed from data collected in over 70 countries between 1968 and 1972, Hofstede's culture dimensions are based on a nationally diverse workplace sample of 116,000 IBM employees. Drawing from only one corporate culture allowed for closely matched samples (i.e. IBM employees in all locations had a similar social status and level of education) whose principle difference was national origin; therefore, the variable of nationality could be isolated quite clearly (Hofstede 1994, 13). Hofstede's theory differentiates the ways in which social groups are culturally programmed using the following five value dimensions:

> ***Power Distance*** – "the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally."
>
> ***Uncertainty Avoidance*** – "the extent to which a culture programs its members to feel either uncomfortable or comfortable in unstructured situations."

Individualism/Collectivism – "the degree to which individuals are supposed to look after themselves or remain integrated into groups, usually around the family."

Masculinity/Femininity – "the distribution of emotional roles between the genders…it opposes 'tough' masculine to 'tender' feminine societies."

Long-term/Short-term Orientation – "the extent to which a culture programs its members to accept delayed gratification of their material, social, and emotional needs." (Hofstede 2001, xix-xx)

Each dimension constitutes a principle value orientation affecting human behavior in ways that are predictable based on how one is programmed. These five, distinct dimensions identify elements of culture in terms of the fundamental problems common to social groups and how groups differ in their solutions to these problems. Based on the statistically verified data used in Hofstede's research (2001), national cultures fall (or are ranked in comparison to one another) somewhere along the continuum between the polarities of each dimension (i.e. the masculine/feminine dichotomy). For example, the USA ranks closer to the masculine end of the spectrum than the Netherlands, which ranks closer to the Feminine end (with 1 being closest to the masculine pole and 53 being closest to the feminine pole, the USA ranks 15 and the Netherlands ranks 51). In other words, according to Hofstede's theory of cultural differences, the more feminine Dutch

culture tends toward modest, consensus driven behaviors while the more masculine US culture tends toward ambitious and assertive behaviors.

Some argue that Hofstede's view of culture as a programmed collective essentializes it as a relatively static phenomenon and that social groups ultimately identified through national or regional boundaries do not always reflect the more complex, multiple layers of culture found within those boundaries (Lovitt 1999; Corbitt 2004; Ess and Sudweek 2005). As previously mentioned, Appadurai (1996) "deterritorializes" culture in light of "the fluidities of the globalizing world" (38) where "mobile worldwide currents…move independently of one another to converge and interact in a complex global system" (40), reminding us to look beyond the common understanding of culture difference to consider "issues that may lie outside culture itself" (43), such as the economic, political, and historical factors often integral to socio-cultural context. Hofstede counters such arguments by arguing that categorical frameworks of regional and national boundaries are useful because of the symbolic value these delineators hold for members of these collectives. While broader conceptions of culture might be increasingly useful in understanding cultural influences, "cross-national variation is [still] closely associated with a society's…cultural heritage" (Iglehart 40). According to Hofstede (2001), nationality and regionality constitute a "reality" that contributes to a sense of "who I am" for its citizens (76). This orientation to culture is particularly relevant when looking at intercultural communication within organizations because "understanding organizational structures often requires an understanding of an

equally complex component: national culture" (Constantinides 32). Indeed, Hofstede's work "is rich in theory and provides a framework for understanding the complexities of intercultural interaction and some of the underlying causes of intercultural conflict…in particular, these concepts are useful for employees in international corporations" (Constantinides 36). Given the distinct national and regional locations of each activity system in the current study, Hofstede's understanding of culture provides an appropriate perspective for guiding the analysis of culture's influence on the adoption decision process.

Despite arguments against using cultural categories to study culture, the fact that the data was collected within a multinational organization makes Hofstede's five dimension framework particularly applicable for analyzing the international diffusion of ASAPS within the multinational organization of GMDC. Another salient connection to the ASAPS case is that much of Hofstede's work focuses on the phenomenon of organizational culture in multinational companies.[53] A final justification for applying Hofstede's work to this case is his exploration of the complex relationship between technological innovations and cultural systems. Noting that there is often a need for culture change before an innovation can be adopted, he states, "technologies presuppose values that run counter to local traditions…In this case the local culture has to be

[53] Geert Hofstede has been a professor of Organizational Anthropology and International Management at Maastricht University, and is currently an Extramural Fellow at the Center for Economic Research at the University of Tilburg (Hofstede 2009). In addition to *Culture's Consequences,* which explores national culture differences, Hofstede published *Cultures and Organizations: Software of the Mind,* which specifically explores the relationships between national cultures and organizational cultures.

changed…and that calls for a conscious strategy based on insight into the local culture" (2001, 442). At the same time, however, Hofstede points out that the function of some technologies is "culturally determined" (453) and argues that technological innovations will not negate inherent cultural differences, "The software of the [technology] may be globalized, but the software of the minds that use the [technology] is not" (453). Hofstede's acknowledgement of culture and technology's mutual influence is in keeping with activity theory's view of individual actions being influenced by the cultural means of the social system, and at the same time, these actions influencing the social system through the use of cultural artifacts. This speaks to the social constructionist perspective of culture as a process whereby "culture as a social structure is created by the social environment in a society; at the same time the social context and practices turn back to restructure culture" (Wang 135). In examining this "ongoing construction" we call culture, then, "a researcher seeking to understand that culture must 'fix' it momentarily" (Grabill 157), and Hofstede's approach allows us to situate the culture within a structured framework. Beamer reminds us that "national identification can be a useful shorthand for making references to large, generalized cultural values" (458). Therefore, categorizing via cultural heuristics allows us "to establish valid cross-cultural comparisons…to start recognizing similarities based on shared contexts and then considering differences within the framework of these similarities" (Thatcher 2001, 464). While Hofstede provides "a useful starting point for understanding rhetorical purpose in cross-cultural settings" (Thatcher 2001, 465) its use does not prohibit a more dynamic exploration of socio-

cultural context, particularly those elements influencing how and why individuals respond as they do to technological innovation.

The Cultural Studies Perspective

While the structured lens of the Rogers, Engeström, and Hofstede hybrid framework is useful for studying the rhetorical nature of the adoption-decision process, it is insufficient for examining the complexity of agency within multiple layers of socio-cultural context. Arguing from an organizational management perspective, Raymond Caldwell (2005) claims that socialconstructionist approaches, whereby "all forms of knowledge, understanding and action are culturally and historically relative" (85), do not readily allow for an examination of individual agency because they "appear to remove human agents from centre stage by placing them within a multiplicity of discourses and practices they do not control, [therefore] they are simply conduits and bearers of knowledge and power" (107).[54] He goes on to assert, however, that because "options for action are always externally constrained and internally context dependent, human actors are, by definition, multi-various creators of discourses and rhetorics of knowledge and expertise that both legitimize and symbolize a belief that change can be achieved, even if

[54] Caldwell identifies four discourses on agency: 1) "Rationalist discourses [that] tend to give priority to centered agency, concepts of planned change and the possibility of strategic action" 2) "Contextualist discourses [that] focus on processes of 'emergent' change and the bounded nature of centered agency in organizationa" 3) "Dispersalist discourses [that] focus predominantly on systemic or self-organizing processes of learning in organizations" and 4) "Constructionist discourses [that] de-centre human agency within discursive practices over which human actors appear to have little rational or intentional control" (36).

the goals rationalities and outcomes of the process are often unpredictable" (110). In other words, despite the often unpredictable complexity of organizational change, individuals retain agency in their expertise and the ability to communicate knowledge within the confines of social and cultural contexts. Drawing from Burke's metaphor of the Human Barnyard, Carolyn Miller (2007) argues that agency is an attribution that is actively constructed, rather than determined, in "the kinetic energy of performance" (152). In this sense, she refers to agency as an illusion that is ideologically constructed from the "nature of the world" as all humans experience it (153). This concept of agency as a performed, contextually-determined construction resonates with Barbara Schneider's (2007) view that power is not so much something acquired as it is "something that must be accomplished over and over again in every social interaction" (182), which speaks to the difficulty in isolating and identifying agency in a given situation.

To allow for a more nuanced analysis of culture and agency in the ASAPS adoption-decision process, this study incorporates an overarching cultural studies perspective as discussed in the literature review (chapter 3). As Longo (1998) points out, "underlying this self-reflexive approach to poststructural cultural study is a philosophy that people know the world through language and that we construct realities through language" (66). Therefore, using this lens when examining the various narratives among the different discourse groups in the ASAPS case will help to illuminate how connections are forged "between seemingly disparate bits of knowledge and experience…[in the production and reproduction of]…cultures they hold in common"

(Blyler and Perkins 245). In exposing the analysis to the broader ideologies and power structures of the various cultural contexts in this case, the cultural studies perspective also will help to illuminate the more complex influences of agency. As Clark (2007) notes "a cultural approach…can build understandings of organizational power that do not view empowerment as a simple hierarchy" (176). Longo (1998) acknowledges, however, that applying a cultural studies approach "could potentially include everything in its situated cultural context, [therefore] the researcher needs to limit the study by constructing a coherent theoretical framework for focusing the study and describing the object of inquiry in its institutional relationships" (65). Consequently, I have chosen to structure this study using Dayton's hybrid theoretical framework with Hofstede serving as the specific starting point in the examination of culture. As themes emerge during the course of this study, however, my analysis will remain open to examining the more intricate influences of power and identification within the broader contextual features of culture as users and change agents navigate their relationships not only with ASAPS but also with one another.

CHAPTER 5: Research Methods

Case Study Approach

The implementation of ASAPS provides a unique opportunity to examine an ultimately successful case of innovation diffusion, and central to my approach in this study is a richer understanding of how the elements put forth in the research questions, namely agency, socio-cultural context, and the technical communicator, influence adoption-decision processes. According to Rogers (2003), most innovation diffusion research "consists of highly structured quantitative gathering and analysis of cross-sectional data" obtained via "one-shot surveys" (196). He argues that such an approach is inadequate for process-oriented research because it "cannot probe backward in time to understand what happened first, next, and so on, and how each of these events influenced the next event in an individual's innovation-decision process" (Rogers 196). Examining the "causes and sequences" (196) of the adoption-decision process over time requires a responsive, less structured research method that allows for a more comprehensive understanding of the multiple dynamics at work. For example, Rogers points to in-depth personal interviews as an effective approach for exploring the nature of the diffusion process. Indeed, the holistic, case study approach is particularly appropriate for examining the transition to ASAPS because the phenomena I am studying are not readily distinguished from the contextual conditions in which they function (Yin 45). This comprehensive research strategy addresses Roger's call for a more thorough examination

of the diffusion process whereby a "search for understanding of the whole" helps to illuminate the influences of culture, agency, and the technical communicator within the system itself (Denzin and Lincoln 57).

Given that I am using the specific ASAPS case to understand concepts important to innovation diffusion processes in general (in other words, I'm exploring ASAPS in order to understand something else) I am engaging in what Stake refers to as an instrumental case study (3). It is through the "multiple sources of evidence" (Yin 14) in case study research that relevant patterns and relationships embedded within the real-life circumstances of the ASAPS story gradually emerge and gain clarity. In addition, the case is "complete" (Yin 162) because it falls within the clear, time delimited boundaries of a problem-solution framework. There was a distinct problem and the ASAPS team developed and implemented a solution to solve it. While this case has many facets and potential avenues of exploration, such as the multiple factors impacting the decision to develop ASAPS, I will stay focused on the study's purpose by following Yin's sound protocol for case study research. At the same time, it is important that I allow for the inherent "opportunism and serendipity" (Zuboff, 1988) of case study research to illuminate concepts not readily apparent.

Data Collection

My analysis centers on the transitioning timeframe in which the GMDC employees (study participants) move from first hearing about the new ASAPS technology to using it on a regular basis. The case story therefore encompasses the six year transition period beginning in the year 2000 when the participants first became aware of the innovation and ending in the year 2006 when all of the participants had at last transitioned to using the technology. The contextual parameters of the case extend to three transition locations where the innovation was adopted: Minnesota in the US, and Gelderland and Limberg in the Netherlands. What follows is an introduction to the people and locations participating in the study.

Before formulating the specific questions for the data collection process, it was important to more fully understand the innovation central to the adoption decision story. Steve met with me for nearly four hours one afternoon in August 2007 to explain why and how ASAPS was developed, as well as to describe the essentials of how it worked. Having already seen aspects of ASAPS 'in action' in Gelderland, I determined that for the purposes of this study it was not necessary to learn how to actually use the system and that it was enough to simply understand how it functioned in the abstract. During this meeting, I also began collecting the names of potential study participants – both users and those who developed and implemented ASAPS. Steve introduced me to the other two technical communicators responsible for implementing ASAPS, Lisa Steepleton and

Karen Nelson,[55] and provided me with the names of the individuals still employed by GMDC (as of August 2007) who worked for the Cardiac Care division during the time period of ASAPS implementation. In an effort to get as thorough and diverse a sample of participants as possible, I also asked Mary Palmer for the names of individuals involved in the ASAPS implementation who might be willing to participate in the study. All of the people she suggested coincided with Steve's recommendations. By early fall 2007 I had an appreciable understanding of the ASAPS system and a list of 12 potential study participants across three locations (8 in Minnesota, 2 in Gelderland, 2 in Limberg). Details about each study participant can be found in Appendix A.

The logistical issues presented by dispersed locations, as well as the focus of the research questions, influenced how I chose to collect information from the study participants. Given the emphasis on the role of the technical communicator as implementer in the adoption-decision process, it was important that I fully explore the perspectives of Steve, Lisa, and Karen; therefore, I devised a list of 17 interview questions to ask each of them (see Appendix B). I chose the face-to-face interview format because finding meaning in the case would rely on the rich descriptions and interpretations of those closest to the implementation process. Since it was impossible for me to fully predict where each conversation might lead, the interviews followed a

[55] Lisa, Karen, and Steve were three of four core members of the ASAPS team. The fourth member, a software engineer, did not have a technical communication background and did not function in that capacity at anytime during the parameters of the study. Since his responsibility was solely for the development of the system, rather than implementing it among the users, he was not included as a study participant.

semi-structured format. As Stake points out, the purpose of in-depth inquiry "is not to get simple yes and no answers but description of an episode, a linkage, an explanation" (65). While I asked each person the same predetermined 17 questions, I also allowed for spontaneous exploratory or explanatory questions that might be triggered by the discussion. As a result, each interview offered a unique "road to multiple realities" (Stake 64). The data collected from the users, in contrast, was solicited via a structured questionnaire (see Appendix C) distributed through the online survey website, Survey Monkey. I chose the online questionnaire format because it was the most efficient and uniform approach for collecting data from participants located in different regions of the world. While it might have been possible logistically to meet the Minnesota participants in face-to-face interviews, I wanted to acquire the information in a consistent manner across all participants so as to reduce the risk of bias. Therefore, every user participant was asked the same questions, with only a slight difference between what was asked of the users in Minnesota (25 questions) and the users in the Netherlands (26 questions). The questionnaire given to the users in the Netherlands included this additional question: How frequently had you worked directly with Americans (i.e. one-on-one interactions either in person or long distance) prior to the introduction of [ASAPS]? Once the interviews and questionnaires were designed, I sought and received IRB approval in February 2008.

Using the data collection techniques just explained, I gathered information from the study participants between February 2008 and March 2008. Since I already had heard

a great deal of Steve's perspective by this point and wanted to avoid the "pitfall" of a principle informant biasing my understanding of the case (Yin 90), I chose to hear Lisa's and Karen's interpretation of events before hearing Steve's. Therefore, I interviewed Lisa first, then Karen, followed by Steve[56]. The interviews were tape recorded and lasted from one and one half hours (Karen's interview) to two hours and fifteen minutes (Steve's interview). During their interviews, Lisa and Karen recalled two additional users who had not been identified previously. Both of these users agreed to participate in the study. Prior to my sending the online questionnaires to the user participants, Steve, who was a well known colleague to all participants, sent an introductory email to everyone explaining my project and encouraged participation in the study. Per IRB requirements, all of the participants gave their consent to participate in the study via an email consent (see Appendix D). Of the 12 who received the questionnaire, only one person in Minnesota declined to participate due to "personal reasons." All of the participants in Minnesota worked as technical writers in the Technical Communication Department of Cardiac Care during the ASAPS diffusion. I gave each of them the following pseudonyms to protect their anonymity while at the same time identifying gender: Julie, Susan, James, David, Paul, Brian, and Tom. Their ages at the start of the project ranged from the middle 30's to the early 50's. The participants in the Gelderland location, Valerie and Marjo, also worked as technical writers and were in their early 40's

[56] As Yin points out, case study researchers "must be cautious about becoming overly dependent on a key informant, especially because of the interpersonal influence – frequently subtle – that the informant may have on you" (90). In addition to organizing the interviews to reduce the tendency for Steve's perspective to predominate, I followed Yin's recommendation to search "for contrary evidence as carefully as possible" (90) while interviewing Lisa and Karen.

at the start of the diffusion process. The participants in the Limberg location, Marc and Irene, worked as translators during the diffusion and were in their late 20's at the start of the project. By the beginning of April 2008, the participant data for the study included 11 completed user questionnaires and 3 recorded change agent interviews.

In late May 2008 I was given the opportunity to interview Mary Palmer as well. While Mary was not a member of the development/implementation team, her support was critical to the development and perception of ASAPS among the eventual users and her story offered yet another perspective in the case. Given the study's emphasis on implementers and users, Mary did not qualify as an actual study participant. Rather than incorporating her contributions directly into the coding schemes, I used her observations in the same way I used the relevant texts I examined (see list below), "to corroborate and augment" (Yin 87) what I found from primary sources, namely the responses from each study participant.

Given the number of years that had passed since the ASAPS' implementation began in 2000 and the collection of data took place in 2008, the case evidence was at risk of being confounded by fallible memories. Yin points out that interviews are "*verbal reports* only" and "are subject to the common problems of bias, poor recall, and poor or inaccurate articulation" (92). Though not oral in nature, the written questionnaire responses were also susceptible to similar issues of biased recall and poor articulation. Additionally, while all study participants had an excellent command of the English

language, it was not the native or birth language for three of the participants in the Netherlands. To address this reality, it was critical that I incorporate not only the multiple perspectives conveyed in the interviews and questionnaires, but also additional sources of evidence. Triangulating with various measures of the phenomenon under study allows for the "corroboratory mode" of "*converging lines of inquiry*" (Yin 98). Therefore, in addition to the aforementioned information, I also used the following documents as corroborating evidence in my analysis:

Project Plan, 10/31/2000

Communication Plan, 1/15/1999

Training Records, from 1/6/2000 thru 2/14/2006

Data Coding

- *Preparing the Data*

To prepare the data for detailed analysis, I transcribed each of the interviews into Word documents. I then color-coded each transcript to facilitate ready identification during analysis (i.e. Steve/blue, Lisa/black, Karen/red, Mary/green). Each survey was transferred from the online Survey Monkey format to a Word document and given a code identifying the participant and his/her location. For example, David was given the code 3m indicating he was the third respondent in Minnesota. Valerie was given the code 2g indicating she was the second respondent in Gelderland, and so on. Each respondent's

code was then placed at the end of each of his/her responses. After appropriately identifying all of the questionnaire responses, I organized them under each question asked in the questionnaire. In other words, I was able to view every response given to a particular question rather than searching through each questionnaire to read individual responses. This format allowed for greater comparing and contrasting of the individual responses. I did not do this for the interview transcripts because the conversational quality of the oral interviews created a great deal of overlap and diminished the distinction between questions asked.

- *Identifying Change Agents, Early Users, and Later Users*

The study participants fell into two distinct categories, those who developed and implemented the innovation,[57]and those who made the decision to use or not use the system. In reference to the first group, because of their principle roles in encouraging the adoption of ASAPS, Steve, Lisa, and Karen, are identified as Change Agents during the data analysis. According to Rogers (2003), "A *change agent* is an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (27). Given the extensive funding and upper management support for the development of ASAPS, it is assumed that its subsequent adoption among Cardiac Care technical writers was the outcome expected among ASAPS high level supporters, essentially the 'change agency' for whom the change agents worked.

[57] These individuals were members of the ASAPS Core Team, which was responsible for all day-to-day activities of the ASAPS project. While three additional people were on this team, only Steve, Lisa, and Karen had technical communication backgrounds and were tasked with implementing ASAPS.

Concerning the second group or users of ASAPS, I have already explained the difference between adopting and using an innovation during the adoption-decision process (see chapter 3). To clarify, the use of an innovation by members of an organization does not necessarily indicate their support for it, or to use Rogers' terms, putting an innovation into practice does not mean it has been adopted (e.g. received full support) at the individual level. Consequently, study participants who had been in a position to decide if they would adopt the new system are identified as Users. While Rogers uses the term *adopters*[58] for those involved in the adoption of an innovation, each of the various levels of "adopter" he identifies, from innovator to laggard, is rife with connotative meaning. Additionally, "adopting" a new technology implies support for the system, despite the fact that using an innovation does not necessarily mean an individual supports its use over other options. To avoid the potential for biased interpretations based on when a person adopts, in addition to the fact that each participant in this study does become a user of ASAPS, those making the decision about whether or not to adopt ASAPS are referred to as Users. For the purposes of this study, it also was necessary to distinguish the length of time it took the Users to adopt or fully accept the use of ASAPS. While there are no absolute markers distinguishing whether someone is early or later in their decision to adopt, exploring the overarching meanings among the Users' individual stories requires classifying them somewhere along the spectrum of early to late.

[58] Rogers further identifies distinct adopter categories indicating how quickly individuals adopt an innovation: innovators, early adopters, early majority, late majority, and laggards. The connotations associated with these terms, such as a positive association with the word innovator and a negative association with the word laggard, makes using these terms for data analysis problematic.

Therefore, the adoption decision point for each user was when he/she not only began using the innovation, but when he/she fully accepted or embraced it as his/her tool of choice over other possible options (See question 19 in Appendix C).[59]

Those in Minnesota who were fully supportive and willing to use ASAPS immediately to within a few months of learning about it are characterized as Early Users (**EU**). These individuals are Julie, James, Paul, and Susan. While some Users in the Netherlands were initially skeptical of ASAPS, all willingly adopted the system within a few months of it being introduced to their location; therefore, the Users in both Gelderland (Valerie and Marjo) and Limberg (Marc and Irene) are identified as Early Users. Those in Minnesota who consciously delayed using ASAPS until a year or more after it was made available to them or who might have felt compelled or obligated to use ASAPS early on yet still took a few years to fully embrace it as their tool of choice are characterized as Later Users (**LU**). These individuals are David, Brian, and Tom. Finally, the characterizations of early and late only reflect the Users' responses to adopting ASAPS when it was first being implemented. It does do not necessarily reflect how the respondents felt about ASAPS at the time they participated in the study or how they feel today. In fact, there were a few initial skeptics who eventually became strong supporters of ASAPS.

[59] I did not qualify "early users" as only those who used ASAPS immediately after learning about it because not everyone who wanted to use ASAPS had the opportunity to do so. The training required before using ASAPS, as well as the drag of legacy documentation, often prevented immediate adoption even among those who were interested in using the system.

- *Coding the Data*

I examined the interviews and questionnaires from the constructivist perspective that concepts and categories ultimately emerge from the data itself and that qualitative analysis is an iterative, highly nuanced process. According to Charmaz qualitative data "remain reconstructions" (258) of multiple viewpoints, whether it's participants recasting the accounts told to a researcher or it's researchers constructing an interpretation based on various perspectives. Recognizing that each piece of evidence I collected offered an interpretation, "a rendering…of a shared or individual reality" (Charmaz 272), and that my interactions with these realities would shape how I processed and understood the case, it was particularly important that I avoid a one-dimensional or prescriptive filtering of the data. To allow meaning to emerge from this complex array of perspectives, I followed Charmaz'a recommendation to view the data afresh through multiple processes of coding and recoding the data. While machine coding might have been helpful in processing the large quantity of text at hand, I determined that mechanically reducing individual responses to isolated fragments would disassociate them from the larger context of the case and impede a more nuanced interaction with the data, which is particularly critical when employing a cultural studies lens. For these reasons, I manually coded the data using two, distinct techniques.

- *Coding Approach #1*

The purpose of the first round of coding was "to treat the data in all its forms equally" (Janesick 65) so as to avoid isolating only what is anticipated and to generate

new, possibly unintended insights. The technique, based on Husserl's concept of *bracketing*, involves locating in the text "key phrases and statements that speak directly to the phenomenon in question" (Janesick 65) followed by categorizing or clustering the key elements for further interpretation. This generic approach to coding emphasized what Foss and Waters call coding "with naïveté" (189) and was structured only by the units of analysis identified by the research questions. "Staying at the surface level of the text" (Foss and Waters 189) during this phase of coding avoided plunging too quickly into specific, often anticipated themes and allowed for the emergence of new and unexpected concepts. Following Foss and Waters' detailed method, I began categorizing the questionnaire and interview responses by identifying the units of analysis, or operationalized concepts, indicated by my research questions. For question #1 involving influences on the adoption decision process, the units of analysis were *socio-cultural context* and *agency*. For question #2 involving the developers of the system, the units of analysis were the *technical communicator role/function*. These units of analysis functioned as a guiding framework during the coding of the survey and interview responses.

As I read the interview and questionnaire texts, I looked for examples of each of the aforementioned units of analysis. Only those portions of the text relevant in some way to the research questions were identified; therefore, all of the text was not coded. For example, I coded the following Change Agent response as an example of *technical communicator role/function* because it identified functional actions of the Change

Agents: "We did detailed analysis of their documents, looking at what they're producing versus what we could do off the shelf, and everything we couldn't already do we took to them as an issue." I coded the following User response as an example of *agency* because it indicated a sense of personal control over the adoption decision process: "If I had said that the use of [ASAPS] would have a negative influence on the writing process, I think I could've prevented the introduction;" and I coded this User response as an example of *socio-cultural context* because it points to the influences of organizational issues: "U.S. users saw the major development focus on going to translation usability, and they felt their needs weren't being met, and management ignored it." If a response served as an example for more than one unit of analysis, I coded it for each one. For example, I coded the following Change Agent response as an example of *agency* and *technical communicator role/function:* "We had this technology and the authoring processes had to be adjusted to work with the technology but the [ASAPS] team as a tools developer could not redo those processes" because it speaks both to perceptions of control and parameters on professional roles. For every coded example, I indicated if it was a Change Agent (**CA**), Early User (**EU**), or Later User (**LU**) response. Additionally, I noted the respondent's location or specific activity systems (i.e. Minnesota - **M**, Gelderland - **G**, Limberg - **L**).

- *Coding Approach #2*

While the first round of coding isolated responses that spoke directly to the phenomenon in question (with relevant responses being determined by the units of

analysis), it did not necessarily identify responses that spoke to the complex interrelationships of activity factors and cultural contexts among the three locations or activity systems. To better examine the key elements in the actual activity of adoption, I turned to Dayton's Hybrid Theoretical Framework (detailed in Chapter 4). Dayton's conceptual lens, framed with an Activity Theory rubric, allowed for a more structured theory-based round of coding. The breakdown of how I applied the Activity Theory portion of Dayton's hybrid analytical framework (Dayton 367) to the data in the second round of coding is detailed in the following table:

Coding Symbol	**Interrelationship among Activity Factors**	**Identifying Elements in the texts**
SO	**Subject** (each adopter/ change agent) – **Object** (ASAPS) - mediated by tools, artifacts, language used to accomplish activity	* View of activity before innovation and after * Contradictions, dissonance, and breakdowns - acknowledged and unacknowledged
SC	**Subject – Community** (people and groups shaping the activity) - mediated by rules and conventions adhered to during the activity	* Subject status, degree of autonomy * Interrelationship with others * Culture, history of subject and work groups

OC	**Object – Community** - mediated by divisions of labor	* Hierarchy in organization * Work role, division of expertise * Quality of leadership

Table 1: Coding Scheme based on Activity Theory as it contributes to Dayton's Hybrid Theoretical Framework (Dayton 367).

Using this framework, I examined the interviews and questionnaires for indications of interrelationships among the following activity factors: *Subject* (each User and Change Agent), *Object* (ASAPS itself), and *Community* (the people and groups shaping the activity of adoption). Reading through the interview and questionnaire texts for a second time, I used the descriptive elements described in the far-right column of Table 1 to identify relevant examples of each activity interrelationship: *Subject-Object* (**SO**), *Subject-Community* (**SC**), or *Object-Community* (**OC**). As I coded responses according to these activity relationships, I also noted if they were User (**U**) or Change Agent (**CA**) responses and the location/activity system (Minnesota - **M,** Gelderland - **G,** Limberg - **L**) of the respondents. For example, the following Change Agent comment about ASAPS, "I'm thrilled with it. Anything we don't like, we change, we fix" reflects the *Subject's* (Change Agent's) view of the *Object* (ASAPS); therefore, it coded as **CA/SO.** This User response to a question about culture differences, "I will never use a

joke or an expression in my emails or conversation because of my knowledge of the U.S. culture and language is not sufficient for those kinds of things" reflects the *Subject's* (a User in Gelderland) relationship with others in the wider *Community* in which the adoption decision process or activity took place; therefore, it coded as **G/SC.** In addition, I marked each coded User response as either an Early or Later User according to the criteria previously established. For example, the response of a Minnesota Early User "Management's support was essential, otherwise [ASAPS] would've been resisted until it faded away" references the importance of leadership in the adoption of ASAPS and coded as the interrelationship between the *Object* (ASAPS) and the *Community* in which the adoption activity took place. The codings for this example were Minnesota, Object-Community, and Early User or **M/OC/EU**. As a final example of how I coded using this approach, the response "The main differences were between the [ASAPS] team itself and the rest of the writers. The [ASAPS] group is highly technical, using IT terminology that was largely unfamiliar to the rest of the department" spoke to work roles and divisions of expertise and coded as the interrelationship between *Object* and *Community* (**OC)** from the perspective of a Minnesota participant (**M**) who was a Later User (**LU**). This example ultimately coded as **M/OC/LU**.

Document Coding

In addition to the extensive coding of the primary data sets (user questionnaires and change agent interviews), I reviewed the three company documents (Communication Plan, Project Plan, Training Records) for information applicable to my research questions. Recognizing that the texts served principally as corroboratory evidence, I did not engage in as detailed a coding scheme as I had with the interviews and questionnaires. Instead, I read each document closely, highlighting key information and indicating which aspect of the research questions it addressed. For example, these sentences in the Communication Plan, "The [ASAPS] solutions will cross numerous Business Units and geographical boundaries… Therefore, communication will be a key element of success for this project" was highlighted and coded as relating to *socio-cultural context*. And concerning the plan for regularly scheduled "Brown-bag" lunch meetings, the phrase "intended to be informal opportunities for people affected by [ASAPS] activities to gain information, offer insights, and participate in a dialog on a variety of topics" was highlighted and coded as relating to both *socio-cultural context* and *agency*. The lengthier Project Plan was primarily concerned with processes involved in the development of ASAPS; however, there were two chapters specific to the focus of this study (e.g. the adoption-decision process among the Users) where I concentrated the coding – the Project Training Strategy chapter and the Transition Strategy chapter. For example, in the Training chapter I noted the distinctions made between the US training strategy and the European training strategy as relating to *socio-cultural context.* The

Training Records did not lend themselves to coding given that they consisted only of individual's names and the dates when they trained. Instead, I referenced the records to examine the relationship between specific trainings and when individuals fully accepted ASAPS.

CHAPTER 6: Categories and Themes Resulting from the Coding

To begin uncovering the meaningful relationships among the various perspectives of the study participants, "categorical aggregation" (Stake 77) was used to further sort the responses identified in the two rounds of coding. According to Stake, the process of collecting and categorizing similar instances allows for the identification of recurring consistencies or patterns from which "issue-relevant meanings" then emerge (75). While repetition of particular phenomena (i.e. multiple sources offering similar perspectives) often suggests greater relevancy, I did not discount single instances of a perspective during the categorizing of responses. Given the relatively few participants in this study (seven Users in Minnesota, four Users in the Netherlands, and three Change Agents in Minnesota), and the even fewer number who were Later Users (three in Minnesota)[60], I approached the data with the mindset that relevant insights could emerge from individual perspectives or singular responses. In other words, a unique perspective was considered just as valid as a shared perspective in understanding what happened in this particular adoption decision case. Therefore, all coded responses were accounted for in this stage of sorting, even if a category or theme was supported by only one response, and their relevance is not weighted in terms of quantity. Because the number of individuals sharing a particular perspective, as well as the number of times a particular idea was

[60] While only three questionnaire participants identified as Later Users, the overall responses from both Users and Change Agents indicate that there were quite a few additional Later Users in Minnesota during the implementation of ASAPS. At the time of data collection, however, many of these individuals were unavailable for participation in the study. While the study participants cannot officially 'speak for' those who did not participate, references to Later Users in the Results and Analysis infer a broader number of individuals than just the three who actually participated in the study.

discussed, is important to understanding the pervasiveness of an emergent theme, however, the concept of repetition, or quantity of response, is incorporated where applicable in the results and analysis portions of the study. Additionally, it is important to note that the themes that emerged during this stage of data analysis reflect the Users' and Change Agents' perceptions of the process or situation as they recalled it and do not yet reflect an interpretation of what was said.

Categories that Emerged during Coding #1

The responses in the first round of coding were separated as individual excerpts from the larger texts (the questionnaires and interview transcriptions) and grouped according to the codes they had been given. At this point, there were multiple individual responses for each of the following units of analysis: *socio-cultural context*, *agency*, *technical communicator role/function*. The excerpts under each unit of analysis were further sorted based on the similarity of the responses. For example, responses that coded as *agency* sorted into two distinct groups, those that expressed more control over the decision to adopt and those that expressed less control over the decision to adopt. The following is an example of a response that grouped under the 'less control' category:

> "Before [ASAPS] was introduced, it had already been decided that the translation work would be transferred to [the company's translation office in Limberg].

> Because we had nothing to say in that decision, our expectations about individual control [in deciding to adopt ASAPS] were low."

This level of sorting was done first with the User responses followed by the Change Agent responses, at which point it became clear that the categories emerging across both groups were nearly identical. The only difference in how the User and Change Agent responses were grouped was in the following additional categories for the Change Agent responses: *View of the Early Adopters*; *View of the Later Adopters*. The five categories that emerged from both the User and Change Agent responses under the *socio-cultural context* unit were: leadership and organizational issues, processes and tools surrounding communication during the transition, cultural issues, perceptions of the ASAPS development team, and view of the ASAPS innovation. Additionally, the following two categories emerged from the Change Agent responses: view of early users, view of later users. The two categories that emerged under *agency* were perceptions of control and perceptions of little to no control during adoption-decision processes. Finally, the two categories that emerged for *technical communicator role/function* were positive and negative perception of the technical communicator's role or function. (See Appendix F for a table of the specific categories for each unit of analysis).

Categories and Themes that Emerged for Socio-Cultural Context

- *Leadership/Organizational Issues*

To better illuminate explanatory themes from the initial categories that emerged,[61] the responses constituting each category were further differentiated. Within the *socio-cultural context* unit of analysis, the responses under *Leadership/Organizational Issues* and *Communication Tools/Processes* organized according to more positive and more negative responses for both Users and Change Agents. Under the *Leadership/Organizational Issues* category the more positive responses from Users organized into the following themes: Management invested in it and paid for travel to learn it, Mary's support was constant. The more negative responses from Users organized into the following themes: Management did not actively support ASAPS or stop negative comments about it, ASAPS was a mandate from on high, had work/issues other than ASAPS to focus on. The more positive responses from Change Agents organized into the following themes: Management gave full resource support, Paul stepped up to own the processes, Dutch management addressed resistors, the management decision to adopt was clear in Gelderland and Limberg, Gelderland had a strong opinion leader. The more negative responses from Change Agents organized into the following themes: Lack of articulated management commitment, management allowed fear to perpetuate, management did not force adoption, most management did not

[61] The following are the categories under socio-cultural context: Leadership/Organizational Issues, Communication Tools/Processes, Culture Issues, View of ASAPS Team, View of Innovation (ASAPS), View of Early Users,View of Later Users.

learn the system, management did not recognize/reward the ASAPS team, had to sell ASAPS in 3 different locations/contexts, management allowed other systems to be developed. An example of a negative theme that was shared by all three Change Agents in the *Leadership/Organizational Issues* category was that management did not actively support the adoption of ASAPS. In comparison, multiple negative themes emerged among the Users in this category. One of the perspectives shared by nearly half of the Users was that management did not actively support the implementation of ASAPS (this response came from both Early and Later Users). Despite this, another recurrent perspective among both Early and Later Users was that ASAPS was an unavoidable mandate from management. Among Early Users, this was seen in a neutral to positive light while among Later Users this held a negative connotation.

- *Communication Tools/Processes*

Under the *Communication Tools/Processes* category the more positive responses from Users organized into the following themes: Writers communicated support and built relationships, saw it working and realized the immediate advantages, face-to-face was the best mode of communication when learning about the system. The more negative responses from Users organized into the following themes: Writers argued, gossiped and made secondhand comments, the system was so complex it was hard to talk about it, the ASAPS team did not listen to the writers. The more positive responses of Change Agents organized into the following themes: Made a concerted effort to build relationships in Gelderland, adapted communication as needed, face-to-face was the most

valuable form of communication, approach in Europe was more formal and planned. The more negative responses of the Change Agents organized into the following themes: Had difficulty communicating the concept of ASAPS to the writers, had difficult discerning what was a transitional problem from a real problem among the writers, resistors would not communicate their concerns. To continue differentiating among the activity systems during this stage of sorting, all responses under each category also were identified as coming from (or referencing) Minnesota (**M**), Gelderland (**G**), or Limberg (**L**). Minnesota responses also were identified as either Early User (**EU**) or Later User (**LU**). (See Appendices G and H for tables of the specific themes and activity system identifiers that emerged for the *Leadership/ Organizational Issues* category and the *Communication Tools/Processes* category under *socio-cultural context*).

- *View of ASAPS Team*

In addition to the categories just mentioned, a positive/negative dichotomy also emerged for the Users' *View of ASAPS Team* and the Users' *View of Innovation (ASAPS)*. While the majority of the responses fell clearly into one of these two categories, the isolated few that indicated a more neutral perspective were set aside for reference during later analysis. Under the *View of ASAPS Team* category the more positive responses from Users organized into the following themes: Change Agents were enthusiastic and prepared, they knew the writing process and understood the writer's challenges and needs, they listened and collaborated with us. The more negative responses organized into the following themes: Change Agents were not supportive and did not meet the

writer's needs, they were dogmatic and intimidating, they did not listen. The themes that emerged from the Change Agent responses organized as follows: They believed in and felt pride in one another, understood the writing profession, incorporated the writer's needs into the design, could have responded better to writer concerns, were not translation experts, had a clear vision, were disappointed that illuminating benefits did not convince people to adopt the system.

- *View of Innovation (ASAPS) and View of Early Users and Later Users*

Under the *View of Innovation (ASAPS)* category the more positive responses from Users organized into the following themes: ASAPS made re-use and translation easier, the system was needed and allowed more work to get done. The more negative responses from Users organized into the following themes: ASAPS changed the job, it was too abstract and difficult to talk about, it was not as good as other systems, unsure that it would perform as promised. The themes that emerged from the Change Agent responses organized as either *View of Early Users* or *View of Later Users*. The themes that emerged under *View of Early Users* organized as follows: Early Users were not invested in legacy tools, they demonstrated the system worked well. The themes that emerged under *View of Later Users* organized as follows: Later Users rebelled against ASAPS and exhibited passive-aggressive behavior, some chose to leave the department rather than adopt the system, some felt it was unnecessary and feared for their jobs, they treated Change Agents as outsiders, most would not articulate their concerns. (See Appendices I and J for tables of the specific themes and activity system identifiers that emerged for

both Users and Change Agents in the *View of ASAPS Team* category and the *View of Innovation (ASAPS)* category under *socio-cultural context*).

- *Culture Issues*

Finally, further distinctions were made among the responses in the remaining *socio-cultural context* category of *Culture Issues*. This more specific level of sorting led to the identification of recurring themes for both Change Agent and Users. The themes from the responses of the Users organized as follows: Professional culture differences were greater than national culture differences, Americans were more articulate, differences were small and did not affect the transition, Dutch were more direct and took their time. The themes from the responses of the Change Agents organized as follows: A Minnesota Nice culture resulted in passive-aggressive behaviors, adoption was easier in Gelderland because ASAPS was already a proven entity, felt more affinity with the Dutch colleagues than the American colleagues, Gelderland decision was consensus driven, Gelderland felt independent from GMDC, Limberg represented multiple cultures. (See Appendix K for a table of the specific themes and activity system identifiers that emerged for both Users and Change Agents in the *Culture Issues* category under *socio-cultural context*).

Categories and Themes that Emerged for Agency

The *agency* unit of analysis split into the following two categories: C*ontrol during Adoption* and *Little/No Control during Adoption*. As with *socio-cultural context,* further themes were identified by distinguishing among the Change Agent and the User responses, as well as the activity system of each User. For example, all three Change Agents were confident in (felt a sense of control over) their vision for ASAPS, yet two (Steve and Lisa) felt they had little control in implementing the vision. Among the Users, nearly half felt they influenced (had a level of control over) how ASAPS was developed, yet nearly a third expressed concern that adopting ASAPS would mean losing control over the look of the final products or documents they produced. The themes that emerged from the User responses under *Control During Adoption Decision Process* organized as follows: Felt they communicated support for the system by actively participating in the development and helping with the transition, were curious about the system. The themes that emerged from the User responses under *Little/No Control During Adoption Decision Process* organized as follows: Eventually all writers would be forced to use the system because most products were being converted to the system, loss of control over what the finished product looked like. The themes that emerged from the Change Agent responses under *Control During Adoption Decision Process* organized as follows: Team had a clear vision for ASAPS, they could control how the system was adapted for the writers, controlled most of the training processes, control during the transition was primarily through attraction. The themes that emerged from the Change

Agent responses under *Little/No Control During Adoption Decision Process* organized as follows: Could not control who used the system, had difficulty getting people to own the processes, ASAPS was competing against other tools that were allowed to development. (See Appendix L for a table of the specific themes and activity system identifiers that emerged for both Users and Change Agents in the *Agency* category)

Categories and Themes that Emerged for Technical Communicator

Finally, similar to *socio-cultural context*, the *technical communicator role/function* unit of analysis split into the following technical communicator categories: *Positive Perception of Role/Function*; *Negative Perception of Role/Function*. As with the previous units of analysis, further themes were identified by distinguishing among the Change Agent and the User responses. The *technical communicator role/function* unit of analysis revealed clearer distinctions among the Change Agent responses than had the previously explained units of analysis. For example, while all three Change Agents felt it was their role to articulate a clear vision for ASAPS, each emphasized different functions based on their perceived responsibilities. Steve felt he was forced to function as a salesperson in his effort to "sell" the system to management, which he perceived as a negative role. Lisa felt her primary function was to improve the system to better meet the writers' needs, a role she perceived positively. Karen perceived her role of training the writers to use the system as a positive function during the adoption process. Because of

the distinctions in their responses for this unit of analysis, Change Agent names are identified with the themes that emerged. Users were clearly divided in their perceptions of the Change Agents having positive versus negative roles in the adoption-decision process. All of the Users in the Netherlands gave positive responses while about half of the Minnesota Users saw the Change Agents as functioning in a negative manner.

- *Positive Perception of Role/Function of ASAPS Team*

The themes that emerged from the User responses under *Positive Perception of the role/function of the ASAPS Team* organized as follows: The team communicated the vision for ASAPS, they collaborated with the writers and improved the system as needed, they educated the writers in how to use the system, they understood the writer's challenges and responded to their needs. The themes that emerged from the Change Agent responses under the same category organized as follows: The ASAPS team articulated a clear vision for the system, they understood the needs of the writers and improved the system to meet their needs, they prepared the writers to use the system.

- *Negative Perception of Role/Function of ASAPS Team*

The themes that emerged from the User responses under *Negative Perception of the role/function of the ASAPS Team* organized as follows: ASAPS team was dogmatic and did not listen, they were IT people who did not understand the writer's needs. The themes that emerged from the Change Agent responses under this category organized as follows: Needed to function as salepeople to generate interest in the system, had no real

authority over implementation, they could not get the writers to own the processes. (See Appendix M for a table of the specific themes and activity system identifiers that emerged for both Users and Change Agents in the *Technical Communicator Role/Function* category.)

Overall Themes for Coding #1

The themes that emerged in the first round of coding and sorting begin to illuminate influential elements of agency and socio-cultural context in the ASAPS adoption decision process. Culture differences, management involvement, relationships between Users and Change Agents, and the perception of the innovation itself all contributed to the varied responses during the adoption decision process, some of which included Change Agent frustration and User resistance. While these socio-cultural influences ultimately led to a decidedly positive adoption process in both Netherlands locations, they led to a more negative adoption process in the U.S. Change Agent frustration during the implementation in Minnesota can be linked to the degree of power they felt over the process. Despite having full authority in the development of ASAPS, the Change Agents felt they had virtually no agency in determining whether the Users adopted the system or not. Perceptions of agency among the Users, however, were exhibited in more varied ways. Among Early Users, active participation in the final development of ASAPS appears to have increased the perception of personal control in

deciding to adopt the innovation. Those who did not actively participate in developing ASAPS tended to be more skeptical of the technology and expressed less control or agency in the decision to adopt it. Despite recognizing that ASAPS' full implementation was inevitable, Later Users exercised agency during the diffusion process by initially refusing to adopt the system.

Categories that Emerged during Coding #2

Categorizing the second round of coding also involved the aggregation of responses; however, the process for identifying categories was more specifically defined by Dayton's coding scheme (see chapter 5). Dayton's framework provided the principle categories in which to place the individual coded excerpts (*Subject-Object, Subject-Community, Object-Community*).[62] The responses in each category were further differentiated into the relevant subcategory of Change Agent, Early User, or Later User. Additionally, the categories were grouped according to the location or activity system of the individual who gave the response (note that only the Minnesota activity system had Change Agents and Later Users, consequently, these categories are not listed for Gelderland and Limberg).

[62] As discussed in chapter 5, the *Subject* refers to Users and Change Agents, the *Object* refers to ASAPS itself, and the *Community* refers to the people and groups shaping the activity of adoption.

Categories that Emerged for Subject-Object in Minnesota

The theme that emerged when coding for the interrelationship of Change Agent as Subject and ASAPS as Object in Minnesota was that they did not question the value or purpose of ASAPS. The themes that emerged when coding for the interrelationship of Early User as Subject and ASAPS as Object were as follows: The Early Users believed in the innovation, they trusted the teams vision and expertise. The themes that emerged when coding for the interrelationship of Later User as Subject and ASAPS as Object were as follows: The Later Users questioned the value/propriety of the innovation, they found the technology too abstract.

Categories that Emerged for Subject-Object in Gelderland and Limberg

The theme that emerged when coding for the interrelationship of Change Agent as Subject and ASAPS as Object in the Netherlands was that they had more confidence in ASAPS than they had during the diffusion in Minnesota because it was a proven entity by the time it was introduced in Gelderland. The themes that emerged when coding for the interrelationship of Early User as Subject and ASAPS as Object in the Netherlands were as follows: The Early Users were upfront in their concerns about the usefulness and potential impact of ASAPS, they accepted the business reasons for adopting the innovation.

Categories that Emerged for Subject-Community in Minnesota

The themes that emerged when coding for the interrelationship of Change Agent as Subject and the Community of people involved in the diffusion in Minnesota were as follows: The Change Agents perceived resistant users as rebellious and passive-aggressive for unfounded reasons, they tried to work with users to better adapt ASAPS to meet their needs. The theme that emerged when coding for the interrelationship of Early User as Subject and the Community was that they felt included in the development of ASAPS and actively participated in the adoption-decision process. The themes that emerged when coding for the interrelationship of Later User as Subject and the Community were as follows: Later Users had very sound reasons to resist adoption, they felt ignored and found it difficult to participate in the process.

Categories that Emerged for Subject-Community in Gelderland and Limberg

The themes that emerged when coding for the interrelationship of Change Agent as Subject and the Community of people involved in the diffusion in the Netherlands were as follows: The Change Agents took greater care with Gelderland and viewed it as a second chance, they identified more with the Dutch culture than the Minnesota culture and appreciated their direct style of communication, they relied on the translation expertise of people in Limberg. The themes that emerged when coding for the interrelationship of Early User as Subject and the Community were as follows: The Early

Users felt include in the development of ASAPS and actively participated in the adoption-decision process, they were sensitive about culture difference but felt it had a minimal influence on adoption-decisions, one person in Gelderland believed she could prevent adoption if she felt it was warranted.

Categories that Emerged for Object-Community in Minnesota

The themes that emerged from Change Agent responses when coding for the interrelationship of ASAPS as Object and the Community of people involved in the diffusion in Minnesota were as follows: The Change Agents saw ASAPS as highly beneficial to both the company and the users, they did not believe management ever fully committed to ASAPS implementation. The themes that emerged from Early User responses when coding for the interrelationship of ASAPS as Object and the Community were as follows: Early Users saw management support of ASAPS as unwavering, they believed ASAPS was a management mandate. The themes that emerged from Later Users responses when coding for the interrelationship of ASAPS as Object and the Community were as follows: Later Users felt ASAPS changed the role of author, they believed ASAPS was a management mandate.

Categories that emerged for Object-Community in Gelderland and Limberg

The themes that emerged from Change Agent responses when coding for the interrelationship of ASAPS as Object and the Community of people involved in the diffusion in the Netherlands were as follows: The Change Agents perceived on-site management support as decisive in both Dutch locations, they saw early resistors handled by management before the implementation, which made their resistance a non-issue. The themes that emerged from Early User responses when coding for the interrelationship of ASAPS as Object and the Community were as follows: Early Users saw management support of ASAPS, which included paid trips to the US to learn the system, as constant, most believed the adoption of ASAPS was a management decision that ultimately made sense. (See Appendices N and O for a table of the specific themes that emerged in each category for Change Agents, Early Users, and Later Users in the Minnesota and Gelderland/Limberg locations.)

Overall Themes for Coding #2

The themes in the second round of coding and sorting further illuminate the contextual elements and dissonances at work in the multiple activity systems, or scenes, where the adoption-decision process took place. The themes of ***trust, voice*** and the uncertainty of ***change*** that emerged begin to clarify the meaningful interrelationships

among elements of socio-cultural context and varying perceptions of agency and technical communicator roles/functions as they relate to the adoption decision process.

- *Subject-Object Interrelationship*

Trust was a critical factor in determining how the Users, or subjects, responded to the innovation, or object of the adoption decision activity. Early Users in both the Minnesota and the Netherlands activity systems believed in the necessity and value of ASAPS; they also expressed confidence in the Change Agents' vision and ability to 'make it happen.' In other words, they were quicker to trust the innovation than Later Users who were far less trusting of both ASAPS and the Change Agents. While most Later Users recognized the need for a new system, they questioned if ASAPS was the best choice and if it would 'do the job,' throwing doubt on the Change Agents' explanations and clarifications. In other words, they found reasons to distrust throughout much of the adoption-decision process. While the Users in Gelderland had serious concerns about ASAPS at the beginning of its implementation, the Change Agents made an effort to form relationships from the outset and full adoption came rather swiftly. The trust exhibited in Limberg was primarily in the management decision to adopt ASAPS. Because it was a cost saving business decision that simplified translation processes, the Users ultimately responded positively to the innovation.

- *Subject-Community Interrelationship*

Being heard or having a *voice* emerged as another critical aspect in the adoption-decision process, particularly in the interrelationship of Users/Change Agents and the broader groups or community shaping the activity. A number of the Early Users in both Minnesota and the Netherlands were involved in the later development of ASAPS and actively participated in the implementation; in other words, they felt they had a voice, or influence, during the adoption decision process. In contrast, Later Users felt their concerns weren't being addressed. In addition to feeling their concerns were ignored, Later Users found it difficult to participate in the process because they lacked the vocabulary to talk about it. For their part, the Change Agents viewed the Later Users' silence as manipulative, passive aggressive behavior. The Change Agents believed they were making every effort to collaborate with the Users and felt some were unreasonable in their resistance to ASAPS.

- *Object-Community Interrelationship*

Finally, *change* was the principle concept at work in the relationship between the innovation/ASAPS and the broader community in which it was implemented. Given that the adoption of ASAPS meant potential changes to work roles and the very nature of how Users write, the adoption-decision process brought about a great deal of uncertainty. The Change Agents believed that management in Minnesota never threw their support fully behind ASAPS. On the one hand they provided the necessary resources to develop ASAPS; on the other hand, they failed to offer concrete verbal support for its

implementation. Some Early Users in Minnesota acknowledged that management was doing little to dispel the uncertainty ASAPS had created, which allowed the uncertainty to perpetuate. Despite this, every User in each activity system viewed ASAPS as a change mandated by management.

After completing the coding and categorizing of User and Change Agent responses, I applied the same coding schema to the transcript of Mary Palmer's interview. The categories that emerged for Mary corresponded closely to the change agent categories; however, I kept her remarks separate from the compiled User and Change Agent data. The perspectives gleaned from Mary's interview were later referenced to corroborate and expand upon the insights that developed during the analysis of the User and Change Agent themes.

CHAPTER 7: Analysis and Discussion of Coding Results

Research Questions

1. How did socio-cultural context and agency influence the adoption-decision process among technical communicators and translators?
2. In what ways did the technical communicators on the Development Team influence the adoption decision process? What were their roles and/or functions during the process?

According to Stake, interpreting the significance of the themes revealed in the coding and aggregating of the data requires a search for consistent patterns or "correspondence" (78) among the emergent concepts. As previously established, single instances, such as a User response that offers an isolated yet meaningful perspective, contribute to our understanding of what happened during the ASAPS adoption-decision process; however, the more powerful explanations depend upon the consistency of patterns that emerge during reflective and repeated analysis (Stake 78). While this study's research questions, in the form of units of analysis, and the use of Dayton's coding framework provided an analytical template for recognizing initial thematic patterns in coding #1 and coding #2, it is the deeper exploration of these themes that allows for the emergence of richer often less apparent meanings. To further "tease out relationships" (Stake 77) among the themes from both codings, I synthesized the results

into a single aggregate of concepts. The following emerged as critical issues for the potential users during the ASAPS adoption-decision process: 1) How the uncertainty of innovative change was managed, 2) Level of trust in the technology and the people promoting it, 3) Degree of 'voice' or influence during the process. Linking back to my research questions, the impact of these three areas on whether or not individuals in Minnesota, Gelderland, and Limberg chose to fully support, or adopt, the new system ultimately depended on the socio-cultural context, perceptions of agency among both the Users and Change Agents, and interactions/relationships with members (technical communicators) of the ASAPS Development Team. Although many of these concepts are mutually interdependent and resist isolated analysis, I've organized my interpretation of the findings using the following categories developed from the syntheses of coding #1 and coding #2 themes (where applicable, each of these themes is then discussed in terms of socio-cultural context, agency, and the role of technical communicator):

Change – Management Involvement

Trust – Perceptions of people

Trust – Perceptions of Technology

Voice – Agency/Role in the process

The following analysis of what influenced the ASAPS adoption-decision process addresses these four areas.

Change – Management Involvement

- *Dutch User Perspective on Management Involvement*

The decision to develop and subsequently implement ASAPS had been made by upper management long before potential users were in a position to decide whether or not to adopt the innovation. Despite the earlier decision making, perceptions of management support for the adoption of ASAPS varied among Users and activity systems/locations. The emergence of different perceptions about management's impact on the diffusion process links to two principle factors in the socio-cultural context: Management style and national culture. Every User in the Netherlands noted that management made it clear they supported ASAPS for business reasons. When asked what most compelled her to begin using ASAPS, for example, Valerie in Gelderland replied, "It was a [management] business decision to change over to [ASAPS]"). Management in both Dutch locations also demonstrated their commitment to the adoption by funding extended User trips to the U.S. to learn more about the system and contribute to its further development. When asked if there were any organizational factors that facilitated the transition to ASAPS, Irene in Limberg responded:

> "The fact that I was given the possibility to spend 9 months at the headquarters [in Minnesota] working with [Steve, Lisa], and the rest of the team certainly helped in greatly increasing my understanding about [ASAPS]."

In addition to communicating overt support for ASAPS adoption, Dutch management appeared to maneuver more passively behind the scenes to remove potential obstacles to the process. Although limitations to this study did not allow me to corroborate with the individuals directly involved,[63] it came to my attention that a few individuals in Gelderland and Limberg were staunchly against the adoption of ASAPS, and at some point early in the Netherlands diffusion process, these individuals moved to other groups or left the organization entirely. While admittedly not verifiable, the interview data nonetheless indicates that Dutch management intervened with early resistors in a decisive manner that appeared unobtrusive to the rest of the group. This early intervention suggests that behind-the-scenes management actions played a role in paving the way for ASAPS adoption in the Netherlands.

Despite Dutch management's apparently integral role in shaping the diffusion context toward an outcome of adoption, most of the Dutch Users, particularly those in Gelderland, felt they were actively included in the decision making process. Valerie, in Gelderland, commented that after face-to-face meetings with department managers, "[they] asked if I thought we should adopt [ASAPS], from a writing point-of-view. I can't remember what I said but it must have been positive or neutral, or we would not have continued." The paradox of Valerie's sense that she participated in a decision that she acknowledged had been a "management choice" speaks to the culturally influenced

[63] During the time of data collection, I did not have access to the Dutch managers involved in this apparent intervention. Also, I did not have access to the individuals who left their respective groups when ASAPS diffusion was initiated.

tendency of Dutch managers "to have employees take an active part in group work and collective decision-making processes" (Elteren 49). As reviewed in chapter 4 during the presentation of Hofstede's dimensions, the Netherlands ranks quite high in femininity, which means they tend to value consensus-based decision making. Management's consensus approach was particularly apparent in the Gelderland location where the team did not fully support adopting ASAPS until after they'd engaged in extensive discussions with their own management and members of the ASAPS Development Team. This emphasis on consensus, regardless of management decisions made earlier in the process, suggests that the adoption-decision process among individuals Users in the Netherlands was influenced by the broader Dutch cultural values of collaboration and egalitarianism.

- *U.S. User Perspective on Management Involvement*

In marked contrast to the cultural emphasis on femininity and consensus in the Netherlands, the United States ranks quite high in masculinity,[64]which helps to explain some of the adoption-decision differences between the locations. Unlike the more uniform perceptions of management among the Users in the Dutch diffusion locations, the Users in Minnesota had decidedly mixed perceptions of management's influence on the adoption-decision process (while management tended to be identified more generally in the Netherlands, management in the U.S. was primarily identified as Mary Palmer, a Senior Manager in the early years of the diffusion and the Director of the Technical

[64] Of Hofstede's five value orientations, the U.S. and the Netherlands differ most markedly in Masculinity/Femininity, with the U.S. ranked 15th out of 53 nations identified and the Dutch ranked 51st out of 53 (2001, 286).

Communication Department later in the process). While all Users in the U.S. recognized that upper-level management had funded the development and subsequent implementation of ASAPS, the Early Users tended to see the change as supported in a helpful way by management. For example, when asked about management's role in the transition process, David commented:

> "[Mary Palmer's] continual support of [ASAPS] was essential. Without a clear indication of her support inside and outside of our department, [ASAPS] would never have been funded, and conversion to [ASAPS] would have been…resisted by the department until it faded away."

In contrast, Later Users tended to see the change as an inflexible mandate by management, as reflected in Tom's comment that the ASAPS adoption "was a push from the top down." According to Hofstede (1991), in the more masculine U.S. management culture there is an emphasis on assertiveness, individualism, and personal accomplishment over the relationships and consensus building seen in Dutch management practices (92).[65] Next, I examine the potential influence of this masculine value orientation on the divergent adoption-decision experiences among Minnesota Users.

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[65] According to Hofstede (1983), the traditional U.S. management style emphasizing "the idea of 'achievement' and 'challenge'" (88) reflects the broader masculine orientation of the national culture.

Although U.S. management styles might be generalized as more masculine or assertive in orientation, Mary Palmer described her style of leading as "naturally participative;" in other words, she tended to identify more with the femininity end of Hofstede's scale than the masculinity end. An example of Palmer's self-identified approach to leadership is the meetings she held with potential users early on in the process to solicit input about their concerns with ASAPS. When asked about management's involvement in the ASAPS diffusion, some Early Users pointed to the meetings as an example of management's supportive approach to the process; however, the responses from Later Users either did not mention these meetings or did not acknowledge them as helpful. In light of the achievement emphasis in the U.S. masculinity orientation, Hofstede (2001) notes that U.S. work meetings are typically "opportunities for participants to tell success stories – not to address issues – issues [are typically] discussed between individuals, at other times" (316). While a more conclusive answer is not forthcoming in the data I collected, my findings do suggest that cultural perceptions of the purpose for workplace meetings might have influenced how some of the Users perceived Palmer's attempts at gaining productive feedback. Rather than generate cooperative input as Palmer intended, these meetings might have been construed as perfunctory and inconsequential for truly addressing their issues of concern. For example, despite the meetings, Brian responded in this way when asked why he didn't communicate his initial thoughts about ASAPS:

> "I think a major problem was that there was a whole group of users who didn't think they were being listened to. It seemed like every request was a problem, and that no one cared about it."

Indeed, understanding perceptions from a masculine culture perspective might help to explain why some Later Users didn't see the value in Palmer's 'participatory' meetings. Palmer's management style during the ASAPS diffusion appeared similar to what is found in the Netherlands where "meetings [are] places where issues [are] addressed and common solutions sought' (Hofstede 2001, 316); however, this approach did not necessarily encourage innovation adoption for most Later Users in the U.S. The influence of the more masculine culture among some of the U.S. Users, in contrast to the more feminine orientation of the Dutch (and perhaps even some of the Early Users in the U.S.), offers a possible explanation for why Later Users in the U.S. didn't respond to Palmer's more participative management approach.

- *Influence of Culture on Dutch User Agency*

The masculine/feminine culture differences found in U.S. and Dutch management approaches also inform our understanding of individual agency during the ASAPS adoption-decision processes. Despite the consensus-seeking nature of the Dutch culture and the perception of most Users that they contributed, at least in part, to the decision to adopt ASAPS, the Dutch Users nonetheless understood management to be quite absolute in its support for the innovation. When asked how much individual control they believed

they had in deciding whether or not to use ASAPS, all but one of the Dutch Users responded, "No control." In essence, the cultural norm of collaboration and achieving consensus contributed to a sense of participation in the process, despite the fact that they did not feel a sense of control over whether or not they actually used the system. Although she also recognized that adoption was ultimately a management decision, Valerie in the Gelderland location was the only User to articulate a sense of individual agency over the adoption-decision process. Valerie's response to the same question about control was, "If I had said that the use of [ASAPS] would have a negative influence on the writing process I think I could have prevented the introduction." Although she had worked as a technical writer in the Netherlands for a number of years, a marked difference between Valerie and the other Dutch writers was her British nationality. Great Britain ranks even higher than the U.S. in masculinity (tieing with Germany in the 9th – 10th spot out of 53 nations). Also, as a Senior Technical Writer ultimately responsible for introducing ASAPS to her department, Valerie's function was slightly higher than the other Users in the organizational hierarchy. These two notable differences might have contributed to stronger assumptions of assertiveness and self-determination for Valerie than for the others during the adoption-decision process, which might explain why she appeared to feel a greater sense of agency than the others in influencing the outcome.

- *Influence of Culture on U.S. User Agency*

Individual agency among the U.S. Users played out in even more complex ways. To many Users in the Minnesota location, management appeared somewhat indecisive in

its support of ASAPS. When asked about organizational factors hindering the transition, Susan, an early adopter, lamented "There was very little initiative to facilitate and support the department through the change process." Indeed, shortly into the ASAPS implementation more pressing business issues began demanding Palmer's attention[66] and she became less involved in the diffusion process. While Palmer's diminished involvement did not necessarily mean a lack of support for ASAPS, it nonetheless appears to have had an influence on how some Users responded to the innovation. The perceived lack of urgency from management gave later Users an opportunity to resist adopting an innovation they recognized as inevitable, yet that they did not wholly accept. In other words, Palmer's more hands-off approach opened a space where Later Users exercised agency despite their seeming powerlessness within an organizational context where the decision to implement ASAPS had already been made. If agency is understood as "the conjunction of a set of social and subjective relations that constitute the possibility of action" (Herndl and Licona 135) then the constitution of power relations in an organization can help to explain how such a window of agency opened in this particular dynamic between management and User. Schneider (2007) points out that power should not be perceived as an absolute bequeathed upon individuals by virtue of their rank in an organization, rather it is "something that must be accomplished over and over again in every social interaction by those who would say and have it said about them that they have power" (182). The power to act (or not act) in a given situation is therefore

[66] During this time, Palmer became increasingly involved in an electronic labeling project for European markets.

dependent not on "apparently stable facts of social structure" (Schneider 195), such as Palmer's official designation as a manager in the organization, but rather "through access to interactional resources that allow one to have one's reality claims accepted as the facts of the matter" (196). Schneider argues that "every communicative interaction (is) an occasion to produce, undermine, or change apparently fixed power relations" (196). Indeed, King and Kugler assert that for effective diffusion to occur, leadership must first establish "the rhetoric of [the] decision situation" (496) by specifically stating reasons why Users would want to adopt the innovation. Because Palmer did not effectively engage the rhetorical situation, her position of authority did not have as great an impact on Users as it otherwise might have. With respect to the power relations between management and User in Minnesota, it might be argued that the lack of visible support from U.S. management, particularly in the form of decisive communication about the innovation,[67] undermined Palmer's power or influence during the adoption-decision process. This shift in perceived power, no matter how mercurial in the longer trajectory of the diffusion process, opened a window of agency during adoption-decision that some later Users willfully exercised.

- *Change Agent Perspective of Management Involvement*

While Users were notably mixed in their perceptions and subsequent reactions to management's influence in their decision to adopt ASAPS, the Change Agents were quite uniform in their perceptions of management involvement. All three believed that

[67] Early User, Susan, felt the lack of verbal support from Mary Palmer caused management to appear "reluctant to make a strong push to get more projects into [ASAPS]."

decisive management support in the Netherlands contributed to the swift adoption of ASAPS among the Dutch Users and that a lack of decisive support in the U.S. led to the greater resistance experienced there. In keeping with the Minnesota User-based findings, the Change Agent perspective suggests that management in Minnesota did not do enough to create an environment, or socio-cultural context, conducive to adoption. In particular, there was not enough supportive communication about ASAPS coming from management. As Lisa Steepleton commented, "We never felt the emotional commitment [of management]." Steve Miller expressed frustration that despite their full support for ASAPS development, management did not promote its implementation, "behind the scenes I was given a mandate and funding, but that was never shared with people…they [the Users] never heard that this is what we're doing and you will get on board, they were just left to their own devices." Additionally, in allowing the continued use of older systems and even the development of additional systems in areas where ASAPS might have readily been applied, Miller felt management communicated the wrong message to potential Users. Karen Nelson's argument for how management inhibited the adoption-decision process summarizes the concern expressed by each of the Change Agents, "I think maybe management should have said, 'we are going to use [ASAPS], that is our tool, we are not going to be using Frame [FrameMaker].' Instead, [Mary Palmer] allowed choices to be made…that never should have been allowed from my perspective." Clearly, the Change Agents were frustrated by the socio-cultural context in which they were attempting to promote ASAPS adoption in Minnesota. The lack of supportive

adoption cues from management gave writers in Minnesota little incentive to switch to the new system and allowed for an adoption-decision environment where change could be openly resisted.

- *Influence of Management on Change Agent Agency*

At the same time the management-shaped socio-cultural context was influencing User agency, it also was influencing Change Agent agency. Considering their roles as both developers and "bridging agents" during the ASAPS diffusion, Miller, Steepleton, and Nelson appeared to have some authority over adoption-decision processes. When specifically asked how much control they felt they had over the transition, however, Miller and Steepleton both insisted they had absolutely no control over whether or not individuals chose to adopt the system. Miller perceived control in terms of mandating the adoption, which he equated to holding a position of authority within the organization. In explaining why he lacked the authority to mandate adoption he pointed out that "none of these people worked for me." Steepleton was more circumspect about how much authority she wielded during the process. She commented:

> "In the end, probably nobody had direct control [over the adoption]. When you have a group of people you can only exert direct dictatorial control so much and the people are going to rebel anyway. This isn't that kind of organization, Mary Palmer isn't that kind of manager."

Characterizing their involvement during the diffusion process as one of *influence* rather than control, both Miller and Steepleton emphasized the nuanced, rhetorical nature of their roles during the critical adoption-decision point among Users. Noting that the organizational context, which included a lack of management participation, did not give him the authority to make things happen, Miller likened his ASAPS promotion efforts to salesmanship, "My control was only by attraction. Selling, that's all I had for control." Lisa also wished that "the organizational support at the management level had been more explicit;" however, rather than perceiving Palmer's less direct management style as compromising her authority, Steepleton viewed it as putting her "in a position to influence…if we just forge[d] ahead." In other words, Miller perceived rhetorical agency primarily in his ability to convince or move Users while Steepleton perceived rhetorical agency primarily in her ability to understand and respond to Users. This assessment is corroborated by User responses to questions of who promoted ASAPS and who facilitated their acceptance of it. Nine of the eleven Users identified Miller as promoting ASAPS in their location while seven of the eleven identified Steepleton as most facilitating their acceptance. David, who listed Miller as promoting and Steepleton as facilitating, remarked on what he remembered most about these individuals, "I felt Cathy really listened to my concerns and suggestions, and made an honest effort to integrate them into the design of [ASAPS]. On occasions (and there were several) when others on the [ASAPS] team were immediately dismissive of my input, [Lisa] wasn't."

In contrast to Miller and Steepleton, Nelson responded with the following to the question about control:

> "I think I had a lot of control over the transitional process with our US based Users…because I was their primary trainer and support person, their view of [ASAPS] was often seen through my eyes or how I presented it, and their first experiences with [ASAPS] came through my training classes."

Nelson acknowledged, however, that her influence was less pronounced with those who worked with ASAPS from the very beginning. As she explained it, "[The first Users] had to go from whatever was used previously, to 'okay, now we're changing.'" Indeed, while all four Early Users in this study were trained by Nelson, only one of them, Julie, listed her as someone who most facilitated her personal acceptance of ASAPS. Later Users (Brian and Tom in particular) were more likely than Early Users to identify Nelson as facilitating their personal acceptance of the system. Weidong and Lee point out that although training has an important function in diffusion processes, its principal impact is on perceptions of compatibility and ease of use (380) (which closely aligns with Rogers' perceived attributes of innovations[68]) and not on actually persuading someone to accept the innovation, which resonates with Nelson's training of Early Users but not with her training of Later Users. While Nelson might have had some control over how the system was perceived, she apparently did not influence the adoption-decision processes of Early

[68] Rogers (2003) describes the 5 attributes of innovations that play a role in innovation diffusion as "1) Relative Advantage 2) Compatibility 3) Complexity 4) Trialability 5) Observability (15).

Users. The fact that she did appear to influence Later Users suggests that learning the functionality of ASAPS was an important factor in convincing those who initially resisted the innovation.

Linked to Miller's and Steepleton's perceptions of agency through rhetorical influence was the extent to which management recognized their efforts. Miller and Steepleton felt keenly the lack recognition for their efforts in developing and subsequently implementing ASAPS. As Steepleton pointed out, the system "succeeded against all odds [to] beat our optimistic business case" yet Mary Palmer did little to recognize the contributions of the Change Agents during the diffusion process. Steepleton summarized her disappointment with the lack of recognition in this simple comment, "We're still waiting for the parade." While the development team eventually did win a highly prestigious GMDC award for their work on ASAPS, Miller noted with frustration that it wasn't Palmer but himself who wrote the actual nomination. For the Change Agents, the lack of verbal support and recognition from management contributed to a socio-cultural context that afforded them little agency during the adoption-decision process. Without the institutionally legitimized agency found in the confluence of "organizational structures and personal dispositions" (Winsor 421), Miller and Steepleton relied almost exclusively on their individual rhetorical skills, pursuant to their "personal dispositions," to influence adoption-decision processes among the potential Users. Miller's agency during the process emerged within a self-described sales orientation of promotion and selling, while Steepleton's agency emerged from more of a problem-

solving orientation whereby she "listened to legitimate concerns" and pragmatically addressed them.

During her interview, Mary Palmer acknowledged her seeming lack of involvement during the diffusion process and reflected on what she might have done differently. According to Palmer, she initially worked quite closely with the ASAPS development team until "it got to the point where they ran like a well-oiled machine." Confident that the team could manage the implementation of ASAPS without her constant involvement, Palmer shifted her focus in early 2003 to other issues important to GMDC's success, namely electronic labeling in Europe. Palmer perceived the shifting of her attention away from ASAPS as a sign that she had confidence in the team members to manage the project on their own. She commented that "it was just a personal thing, not necessarily a conscious thing…what I [took] as 'I trust you to deal with this now'." Later, she recognized that the ASAPS team did not necessarily perceive her distance in the same positive light and acknowledged that more reinforcement from her might have benefited the diffusion process. Reflecting on the importance of giving recognition, even to seemingly autonomous, self-reliant teams, she said:

> "Some people just need more reinforcement, and it's a mistake as a manager to not give people that recognition, even if you just say explicitly 'You know, I know I haven't given you much time, but the reason I'm doing it is because I know you'll do a good job. That will tide [someone] over a little bit, but you

> really have to demonstrate that you understand at least some of what they're doing. They need that positive reinforcement and recognition of what they're accomplishing. Some people need it less than others, but everyone still needs it."

In light of Miller and Steepleton's disappointment in not being recognized during the ASAPS diffusion, Palmer's insights highlight the complexity of management's influence on innovation diffusion processes. In shaping the socio-cultural context for innovation diffusion, management also influences the perceptions of agency among those responsible for promoting adoption. As this case demonstrates, the impact on agency can be quite subtle and paradoxical, making it difficult to recognize. On the one hand, Miller and Steepleton felt the lack of management involvement and recognition detracted from their agency in influencing adoption-decision processes. Palmer, on the other hand, believed it signaled confidence in the Change Agents' autonomy, suggesting that a non-hovering approach from management actually instilled them with the agency to effectively implement the innovation.

Trust – Perceptions of People

While management style and national culture shaped the socio-cultural context surrounding the ASAPS diffusion, another compelling influence on the adoption-decision process was the direct relationships between Change Agents and Users in each location. How Change Agents and Users perceived one another, and the relationships that

subsequently developed between them, had a profound influence on how adoption-decision processes evolved. In this section, I compare and contrast the relationships that developed in each location or activity system, linking them to culture and trust.

- *User Perceptions of Change Agents in Minnesota*

One of the starkest differences between Early and Later Users in Minneapolis was in their perceptions of Change Agent influence during the individual adoption-decisions, particularly in the early stages of the diffusion process. From the start, Early Users expressed confidence in the Change Agents' technical abilities and willingness to work with them during the transition. When asked what they remembered most about those who influenced their acceptance of ASAPS, Julie (an Early User) remarked that "Steve Miller and Lisa Steepleton brought experience/credibility, in working with a similar solution [at another company]," and Susan offered, "Steve and Lisa were very patient in answering my questions." In contrast, the Later Users viewed the Change Agents as dogmatic in their promotion of ASAPS and unwilling to listen to User input. When asked why he refrained from communicating his initial concerns about ASAPS, Brian commented, "I found the [ASAPS] group…intimidating and issues brought up were met with pushback." Also a Later User, Tom pointed out that "During the early development of [ASAPS], the…team seemed aloof and did not seem to want input from writers on how to develop the tool." In other words, the Early users tended to perceive the Change Agents as positive and helpful, as Susan remarked, "[The Change Agents] all had positive attitudes about [ASAPS]," while the Later Users tended to see them as

unresponsive and even, in some cases, resistant to their contributions, as Brian commented, “It seemed every request was a problem and that no one cared about it.” Kahn (2000) speaks to the importance of building informal alliances as part of successful technology implementation, arguing that they enable diffusion to proceed with fewer organizational disruptions (344). The more positive alliances or relationships Change Agents formed with some Users appeared to contribute to their early adoption while the clear lack of alliances with other Users disrupted adoption-decision processes that ultimately led to later adoption. Drawing from Rogers’ claim that credibility and empathy are important Change Agent characteristics for successful diffusion (Rogers 376 to 386), perceptions of Change Agent credibility appeared important for building positive relationship among Early Users, and perceptions of Change Agent empathy appeared important for Later Users. In other words, the perception among Later Users that Change Agents were not empathic to User needs, regardless of how credible they might appear, helps to explain why alliances did not readily form and why adoption-decisions consequently were hindered.

- *Change Agent Perceptions of Users in Minnesota*

For their part, the Change Agents expressed both gratitude and frustration at the different reactions from Users in Minnesota. Concerning the Early Users, Steve Miller was particularly grateful for Susan’s early embrace of ASAPS. When asked who helped to facilitate the transition to ASAPS, he noted that Susan learned ASAPS quickly and was able to demonstrate that it worked. He remarked that:

> "by her behaviors and accomplishments…[Susan] put the lie to the oar draggers [those resisting adoption]…and it gave me an amazing argument when these people said [it's not working] and it just buoyed my spirits, I mean it was in the darkest hours…it was such a delight to have one person who had no vested interest, nothing to gain – since there were no rewards – she just proved it worked."

Karen Nelson also emphasized the supportive contributions of Early Users, emphasizing that "they were positive and when they had problems they were able to articulate them." In contrast, Change Agent perceptions of Later Users were considerably more negative. When asked if there were people who inhibited the transition to ASAPS, Nelson remarked, "We definitely had some people who didn't care for the system and we kind of felt like they were looking for reasons to not use it, or to be angry and upset about it." Steepleton acknowledged that she had little sympathy for those resisting adoption:

> "I didn't get to a large extent what their problem was, it seemed to me that they were just being resistant, they were afraid for their jobs, I'll just say upfront that I have very little tolerance for that. If you do your job, you'll keep your job…I'm sure that created some friction."

While Steepleton did not have the authority within the GMDC organizational structure to dismiss people from their jobs, this comment reflected her perception that people resisted the technology out of fear they would lose their jobs to the technology (incidentally, none

of the Users specifically articulated this concern in their questionnaires). Miller expressed the most frustration with those who didn't embrace the new technology and admitted the resistance confused him, "[ASAPS] was a challenge to [the resistors'] very notions of who they were and what their contributions were. Gosh, to me it was just so irrational that it's hard to place it, I just can't." In other words, the Change Agents tended to find it difficult empathizing with the Later Users' concerns.

- *Credibility and Empathy in Diffusion Relationships*

Comparing the Change Agent responses to the User perspectives discussed earlier, it is evident that perceptions of credibility and the ability to empathize among both the Change Agents and Early Users helped to determine if positive, trusting relationships developed early on in the diffusion process. Users such as Julie and Paul felt the ASAPS team understood and appreciated their concerns and was qualified to address them; in other words, they had a trusting relationship with the Change Agents during the adoption-decision process. This early trust was then reciprocated in the gratitude of the Change Agents who saw the Early Users as competent, positive contributors. In essence a reciprocal, affirming relationship developed between Change Agents and Users that was perpetuated by continuous, alliance-building interactions. In contrast, a lack of empathy appeared to be the principle factor in the distrust that initially existed between the Change Agents, who had difficulty understanding why Later Users didn't accept ASAPS, and Later Users, who perceived the Change Agents (specifically Miller and to some degree Steepleton) as initially unresponsive to their concerns about

the system. This suggests that reciprocal perceptions of credibility and empathy from both Change Agents and Users are important for building, and perhaps maintaining, the informal alliances deemed so critical to successful innovation diffusion.

- *Culture and Communication in U.S. Diffusion Relationships*

Two factors in the socio-cultural context, culture and communication, appeared to be primary influencers in the development of empathetic, trusting relationships among Change Agents and Later Users. Despite the fact that all of the Minnesota participants in this study considered themselves technical communicators, professional culture differences existed between the Change Agents and Users. Having come from an IT background, Miller and Steepleton were viewed by Users[69] as software developers rather than technical communicators and the Later Users in particular perceived this to mean that the Change Agents were not as professionally attuned to the writers in the department. When asked about cultural differences among those involved in the transition to ASAPS, Paul pointed out that "software developers very seldom see their products in the same way that users do," and David explained that the ASAPS team was "highly technical, using IT terminology that was largely unfamiliar to the rest of the writers." Speaking to the technical complexity of the system, Brian acknowledged feeling intimidated and that "the complexity was such that it was hard to communicate" why he resisted adopting ASAPS. An additional cultural distinction between the Users and Change Agents that likely exacerbated a sense of difference was that Miller and

[69] Nearly all of the Minnesota User participants in the study (Early and Later Users) commented on the professional culture differences between themselves and the Change Agents.

Steepleton, as well as Jones the software engineer, had worked together in another organization. As a result, David pointed out, "the [ASAPS] team itself was seen as a group of outsiders….they seemed fairly close-knit, but insular and entirely separate from the rest of the department." Rather than reach across these perceived differences, some Later Users pulled back from forming relationships with the Change Agents and resorted to, as Brian noted, "just hunkering down and getting your work done." Indeed, differences in professional culture, coupled with differences in the ability to talk about the innovation, made it particularly difficult for some individuals to discuss their concerns effectively with the Change Agents. The anxiety generated by a lack of familiarity or understanding due to culture difference speaks to the role of communication in reducing intercultural uncertainty (Gudykunst and Kim); however, communication stymied by a lack of adequate vocabulary and feelings of intimidation likely is not equipped to successfully reduce such uncertainties. Culture and communication differences therefore hindered some Users from developing empathetic and trusting alliances with Change Agents that ultimately might have contributed to earlier adoption.

Regional differences in culture between the Change Agents and the Users in the Minnesota location were an additional element of difference that influenced the relationships that developed during the ASAPS diffusion. In particular, Miller and Steepleton identified themselves as culturally different from the "Minnesotans" comprising the majority of technical writers in the U.S. location. Although raised in a

Swedish-influenced environment that stressed modesty and restraint, Miller identified more with the cultures of Chicago and Silicon Valley where he had worked for many years. He explained that in Chicago in particular, people used assertive behaviors as a tool to accomplish their goals, and while working there he learned that "if I'm going to protect [the interests] of my work group then I guess I have to yell and scream to neutralize the yelling and screaming [of the others]." For her part, Steepleton (an Ohio native who also had been a successful competitive debater) was accustomed to a more straightforward style of communication. Steepleton pointed out, "[Steve] and I are not from here, he's from Chicago where you get in people's faces, and I'm from Ohio…[where] it's a much more in your face kind of culture, things that are just day-to-day business there are rude here [in Minnesota]." In other words, the cultural identities of both Miller and Steepleton informed the more direct and assertive style of their workplace communications, and both were struck by how different Minnesota was from what they had been accustomed to in other workplace experiences. Commenting on the diffusion process in the Minnesota location, Miller and Steepleton noted that rather than direct confrontation, many of the Minnesota Users tended to disagree behind the scenes in a much more passive, aggression-avoidance manner. Miller specifically commented, "When we had meetings and said 'well, what is your issue?' it was silence, and that I consider a "Minnesota Nice" [behavior]." This perception was corroborated by Steepleton's comment, "I think the whole Minnesota Nice culture was an influence here [in Minnesota]."

This noted Minnesotan approach to communication has been dubbed colloquially as *Minnesota Nice* and, according to Danish-Norwegian novelist Aksel Sandemose, is a cultural legacy of the Scandinavians who first settled the upper Midwest region. Folklore suggests that the behavior indicative of a *Minnesota Nice* communication style reflects the fictional Jante Laws of self-deprecation, such as 'do not think you are special' and 'do not think you know more than us.' While it is often perceived as a generally friendly and welcoming behavior, Sandemose argues that *Minnesota Nice* is also used as "a synonym for phoniness and passive aggression" ("Tracing the Origin"). According to Sandemose, to reference someone's behavior as *Minnesota Nice* often implies that he exhibits a surface-level friendliness that might belie his true, undisclosed feelings or judgments. Each of the Change Agents, as well as Mary Palmer, identified the more indirect *Minnesota Nice* style of communication as a notable aspect of GMDC's Minnesota workplace culture. As Palmer explained, employees from other regions of the U.S. who were accustomed to "more yelling and screaming [that] doesn't mean anything" often had trouble adapting to the more passive approach found in Minnesota. As Miller recalled, "I'd go to one-on-one meetings and there was always this silent form of resistance…it's very hard to adapt to this passive-aggressive stuff." In an attempt to understand the assumptions influencing the less assertive Minnesota style, Steepleton noted that "there seemed to be confusion between 'I disagree with you' and 'I don't like you'." Unaccustomed to this culturally influenced approach to communication, Miller and Steepleton were confounded in their attempts to reach understanding with Later Users.

The inability to effectively exchange ideas generated deep felt frustration and impatience toward those who resisted adopting ASAPS and resulted in a diminished willingness to listen to or even trust some of the Later User's view of the situation. For example, Steepleton described a few of the Later Users in this way, "Instead of working with you to see what the solutions are, they were undermining and there was a certain amount of backbiting and gossiping, it was very passive aggressive kind of stuff." Regional culture differences therefore compromised the Change Agents' ability to effectively communicate and ultimately influence the adoption-decisions of some Users.

Multiple levels of culture difference among Change Agents and Users therefore interfered with communication processes during the adoption-decision process. While not linked to culture specifically, Rogers' conception of communication during innovation diffusion hinges on competing concepts of similarity and difference (descriptors also used in the more static meta-conceptualizations of culture comparisons). On the one hand, Rogers claims that diffusion is accelerated by more homophily[70] (as opposed to heterophily) between Change Agents and Users because it allows for more effective communication. On the other hand, however, he suggests that because it can breed insularity to new ideas, similarities actually can act as a "barrier to the flow of innovations within a system" (306) and subsequently points to differences or heterophily as more conducive to innovation among networks of individuals. Of course, Rogers' vague and contradictory essentializing of communication processes among Change

[70] Rogers (2003) defines homophily as "the degree to which a pair of individuals who communicate are similar," and heterophily as "the degree to which pairs of individuals who interact are different" (306).

Agents and Users does little to address the complex interrelationship of culture and communication during adoption-decisions. As previously discussed, diffusion scholars increasingly argue that although helpful in understanding what might compel someone to adopt or reject an innovation, relational models emphasizing barriers to shared meanings and the bridging of differences do not adequately address the impact of the broader contexts in which they are embedded. Indeed, this analysis has highlighted the importance of shared perceptions of credibility and empathy in creating the trusting relationships conducive to adoption, and it also has illuminated the various cultural influences that impeded such alliances. Examining the relationships that developed among Change Agents and Users with a more critical cultural studies lens, however, invites a more nuanced understanding of why some Users responded as they did.

- *Additional Factors in Later User Resistance*

In addition to the factors just discussed, the resistance exhibited by Later Users might also be construed as self-defense in a time of looming change. The fact that the newly hired Change Agents were seen as 'outsiders,' coupled with the introduction of an innovation not wholly understood, contributed to an emerging culture of change that threatened the stability of existing power structures. As Carlson explains, innovation diffusions are more prone to fail when the changes they portend conflict with established organizational values and appear to threaten job security (86). Furthermore, the shifts in power or "power politics" (Munir 1408) that often accompany such change can be equally disruptive to adoption-decisions. Although none of the Users admitted that they

feared for their jobs during the adoption decision-process, Steepleton's comment concerning User resistance, "If you do your job, you'll keep your job," was telling. Not only were Users faced with adopting a profoundly different technology they lacked the vocabulary to adequately discuss, they were being asked to do so by individuals who in many respects were perceived as foreigners in the organization. These shifts in the socio-cultural context resulted in some Users retreating, in what could be interpreted as the Minnesota Nice cultural norm of avoiding confrontation, to protect themselves from feeling inadequate in their ability to communicate and feeling threatened by perceived shifts in power. The consequence, therefore, was an unwillingness to embrace what was perceived as an invidious takeover by the unfamiliar.

- *User Perceptions of Change Agents in Limberg*

The relationship between Change Agents and Users in the Netherlands tended to be more effective in promoting ASAPS adoption among Users than it had been in the U.S. An important factor to consider in this difference between the U.S. and Dutch, however, is that the diffusion process was not approached in the same way in each location. The transition in Limberg[71] was led by the Dutch translation expert on the development team, Erik Verbeck, who was employed onsite in Limberg.[72] Given Verbeck's principal role in Limberg during the diffusion, the U.S. Change Agents

[71] Given that translation is integral to the functioning of ASAPS, the system was implemented simultaneously in both the Minnesota and Limberg locations beginning in 2000.
[72] Verbeck's role in the Limberg translation office is not fully examined because the focus of this study is the influence of technical communicators in adoption-decision processes and not those working in translation.

functioned less as promoters of the technology, as they had been in the U.S., and more as technology experts who fine-tuned the system to meet translation needs and who trained the translation staff in how to use the system. Numerous reciprocal on-site visits between Minnesota and Limberg, which predominantly involved Verbeck, Miller, and Steepleton, as well as weekly emails and phone conferences, kept communication flowing between Change Agents and Users. Although there was some initial skepticism in Limberg about adopting a new system,[73] the repeated face-to-face visits and frequent communication among key people in both locations fostered close working relationships during the adoption-decision process. When asked what compelled her to become fully supportive of ASAPS during the implementation, Irene pointed to "the experience and dedication of the team" as an important factor in convincing her ASAPS was "something good." Further commenting on what influenced her acceptance of ASAPS, Irene recalled:

> "A great enthusiasm and dedication [from Verbeck, Miller, and Steepleton that] certainly helped in getting me 'on board.' To see that they believed in it and to get the feeling that they were on the right track, certainly helped me to be convinced I wanted to join in."

Irene also attributed her easy acceptance of ASAPS during the Limberg implementation to spending 9 months in Minnesota working with Miller and Steepleton on the

[73] Marc commented that "at that time I was a bit reluctant to huge changes in my direct work environment," and Irene pointed out "I remember a few people (localization coordinators and linguists) were very skeptical. They thought this was just another new tool that we needed to learn and invest time in, which eventually would offer very few extra advantages."

development of the system. She commented that she was unaware of any "behind the scenes" difficulties once the transition began and believed her time working with the development team put her "in a better position to explain [ASAPS] to my colleagues" back in Limberg. In addition to the onsite collaboration with Irene, Miller also attributed the productive work relationships that developed in the Limberg adoption to his three-month stay in the region during the initial launch. Living and working in the collaborating locations created more concentrated face-to-face time in the workplace and allowed for more personal relationship development between the Change Agents and Users. In sum, committed onsite leadership in Limberg, frequent and lengthy travel to both Limberg and Minnesota, and consistent communication practices, helped build trusting adoption-conducive relationships among Change Agents and Users.

- *User Perceptions of Change Agents in Gelderland*

In contrast to Limberg's relatively swift adoption early on in the diffusion process, a few years passed before ASAPS was introduced and ultimately adopted in Gelderland. Given the GMDC subsidiary's somewhat autonomous status[74] in the early 2000's, it took nearly two years after the initial implementations in Minnesota and Limberg for Gelderland to begin considering the diffusion of ASAPS to their location. As previously discussed, Steve Miller was instrumental in creating an opportunity for ASAPS adoption in Gelderland, and after laying the initial groundwork with key

[74] At the time of the ASAPS diffusion, Gelderland still very much viewed itself as a separate organization from the GMDC parent company. According to Miller and Steepleton, there was a palpable aversion to the GMDC culture in Gelderland right down to an unwillingness among employees to wear the GMDC corporate colors and logo.

individuals in Management, he and Steepleton worked together to influence the adoption-decision processes of the writing team at that location. Steepleton described the development team's influence in Gelderland in this ways, "In a way we got a little bit of a second chance with [Gelderland]…we were smarter about the way we brought it in." With the difficult experience of the Minnesota adoption already under their belts, Miller and Steepleton recognized the importance of building strong relationships during the diffusion process and took steps to do just that. At the onset of the adoption-decision process, both Miller and Steepleton met face-to-face with the writers in Gelderland to discuss their concerns with the system. During these intensive and at times contentious meetings, views were openly shared between the Change Agents and Users in an effort to reach common ground. Miller described the communication style of the Dutch writers as "very out there, they'll just tell you 'I don't agree with that'…you have the discussion and you move forward." Miller and Steepleton embraced the more direct communication style of the Dutch and perceived the consensus-driven negotiations as more productive than what they had experienced in the U.S. Steepleton described the writers in Gelderland as more logical in their response to ASAPS than the writers in Minnesota had been, referring to the Dutch as "much less emotional about it [and] more willing to compromise." Having travelled to Gelderland to administer training after the initial meetings were conducted, Nelson noted the shared sense of "We're in this together and we're going to make this work" among the Dutch writers. For their part, the Users in Gelderland felt that the Change Agents, as technical writers themselves, were attuned to

User concerns and were open to discussing how best to address them. When asked what they remembered most about who influenced their eventual acceptance of ASAPS, Marjo answered that "it was very easy to communicate with [the Change Agents] because they knew the writing process," and Valerie pointed out, "[The ASAPS team] understood what we needed and why – they were prepared to discuss and negotiate each point until it was resolved." In other words, there was a sense of mutual understanding between the U.S. Change Agents and the Dutch Users, which fostered open and trusting work relationship between the locations. Indeed, the likely influence of such collaborative processes on Users' early adoption-decision processes is supported by Doheny-Farina's claim that relationships built through "negotiation and sharing of perspectives, values, language, and knowledge" (10) are central to successful innovation diffusion processes.

- *Socializing and Communication in Dutch Diffusion Relationships*

A number of socio-cultural factors, in many ways influenced by specific Change Agent efforts, contributed to the notably positive and trusting relationships that developed between the U.S. Change Agents and the Dutch Users in Limberg and Gelderland. In particular, the intercultural communication practices and social interactions between locations were pivotal in shaping the relationships conducive to innovation adoption. Hofstede notes that the diffusion of technology is more productive when the donor (in this case the development team in Minnesota) contributes technical know-how and the receiver (in this case the Users in Limberg) contributes cultural know-how about where the technology is being implemented (221). The frequent and lengthy visits between

people in Limberg and Minnesota during the development and launch of ASAPS allowed for a reciprocal flow of culturally influenced knowledge that contributed to mutual appreciation and understanding among Change Agents and Users. In addition, nearly all of the Dutch Users in both locations remarked that the face-to-face meetings early on with the Change Agents set the stage for constructive work relationships during diffusion. Marjo commented, for example, that "these meetings result in better personal contacts, which makes subsequent email correspondence and phone calls easier." These observations corroborate extensive virtual team research that finds initial face-to-face meetings, as well as frequent and regularly scheduled communication processes, critical to the ongoing success of globally dispersed work groups (Duarte and Snyder 99).

From a cultural perspective, Miller and Steepleton identified with the distinctly Dutch approach to communication, as Miller exclaimed about his interactions with the Dutch Users, "They were no holds barred, no nonsense, and I just went 'Yes, my tribe, let's go!' And we'd have great conversations and we'd have stuff illuminated…we made a great connection." Complimenting this in the Gelderland diffusion was the confidence of the Users that the shared professional identity of technical writer meant the Change Agents understood the challenges being communicated to them. An additional intercultural communication factor that appeared to influence relationship development in the Netherlands was the Dutch cultural tendency "to separate negative judgments about things they dislike from the people who produce these things" (Hampden 283). Miller and Steepleton welcomed what they perceived as a more logical, issue-based approach to

the adoption-decision process, particularly after their frustrating experiences with what they perceived as emotion-laden resistance in Minnesota. Miller explained his preference for the Dutch approach to communication over the Minnesota approach in this way:

> "We just felt like we were at home when we were in [Gelderland]. At the end of the day it was 'oh, let's go get dinner.' None of it [the disagreements] was personal. Whereas in this culture [Minnesota] it was "oh, you disagreed with me, you must not like me…and I'm hurt…and what do you mean dinner? You don't like me."

Indeed, both the Change Agents and the Dutch Users perceived the direct communication style between them as useful for building consensus, which led to a greater sense of trust and shared purpose during the adoption-decision process.

Social factors also appeared to enhance the development of productive working relationships between the Americans and the Dutch. Onsite face-to-face meetings and the temporary and long-term travel of individuals to each location not only contributed to more direct workplace collaborations, these communication practices also allowed for the more informal social interactions that typically occur after work hours. Because relationships take time to develop, the intimacy of interaction afforded by non-work gatherings can contribute over time to increased self-disclosure (Altman and Taylor) and, subsequently, trust development among colleagues. This more personal aspect of relationship development was particularly pronounced in the U.S. location. After-work

social interactions between Change Agents and Users in the Netherlands locations tended to involve dining together in restaurants and sightseeing excursions on the weekends; however, when Valerie and Marjo visited the Minnesota location, the ASAPS team engaged in the more traditional American custom of inviting work colleagues to the home for dinner.[75] When asked about culture differences during the transition, Valerie specifically noted the following distinction in after-work socializing between the U.S. and Dutch: "[The Americans] were extremely hospitable, inviting us to their homes for barbecues, etc. In the Netherlands, we go out to a restaurant with visiting colleagues but rarely invite them to our own homes." Hofstede (1983) suggests that when striving for consensus the Dutch are highly motivated to maintain "good interpersonal relations" (88); therefore, while the level of social intimacy exhibited by the U.S. Change Agents toward visiting colleagues was perceived as unusual by the Dutch Users, it was nonetheless accepted as a polite effort to make them feel welcome and to build positive working relationships. In summary, cultural factors involving communication and identification, as well as conscious efforts on the part of the Change Agents to foster positive and trusting relationships, contributed to relatively early and uniform ASAPS adoption-decisions in the Netherlands.

[75] It is interesting to note that Miller, in particular, welcomed Dutch Users to his home when they visited Minnesota; however, he was less likely to invite the Minnesota Users to his home. When reflecting on what he might have done differently to influence adoption in the U.S. he said, "Maybe if I threw some dinner parties…there certainly were things I did [with the] Europeans that I didn't do here."

Trust – Technology

While the relationships that developed between Change Agents and Users clearly impacted User response during the adoption-decision process, User perception of the technology itself appeared even more central to the decision whether or not to adopt ASAPS. This section of the analysis addresses how the socio-cultural context and Change Agent roles influenced the differing User perceptions of ASAPS that emerged during the adoption-decision process. The analysis that follows focuses on the specific perceptions the Change Agents, Later Users, and Early Users had of ASAPS during adoption-decision processes.

- *Change Agent Perceptions of ASAPS*

As developers and promoters of such a cutting edge system, Miller, Steepleton, and Nelson were proud and enthusiastic supporters of ASAPS. When asked her view of ASAPS, Steepleton reflected that the development and implementation of ASAPS defined most of her recent work experience and had she not thought "it was a good thing, I wouldn't have made it my career." To the same question, Nelson commented that she believed in ASAPS from the start and when first introduced to it "was awestruck with how complete a system it was." The most effusive support of ASAPS came from Miller, however, who described the development of the single source system as "the realization of a vision." His excitement about ASAPS was made abundantly clear with his simple statement, "I'm thrilled with it!" Not only did the Change Agents support the business

reasons for the system, they also believed it would improve documentation processes for everyone involved. Steepleton noted that ASAPS automated menial tasks in a way that improved the quality of the author's and translator's work lives, and Miller pointed out the benefit that it freed writers to focus more on content since they no longer needed to worry about the more mundane tasks of formatting and "moving things around." The Change Agents were unanimous in their belief that the changes brought about by ASAPS were both necessary and beneficial for GMDC's technical communication department; as a result, they were fully supportive of the innovation's adoption in each location.

- *Influence of Change Agent Pro-Innovation Bias*

Convinced of ASAPS merits, the Change Agents tended to assume Users would perceive it in a similar way. Given this assumption, the Change Agents apparently were not fully prepared for the level of resistance displayed by some Later Users in Minnesota. Despite her noted skill in listening to User concerns, Steepleton admitted that her adamant support of ASAPS made it difficult to empathize with the negative feedback she was hearing about the system, particularly during the early phases of the adoption-decision process. Rather than accepting the concerns of later Users as wholly legitimate, Steepleton tended to perceive the complaints as irrational and based in fear. She remarked, "I might not have been as patient with people who didn't believe in it as I should have." Miller also expressed frustration with the lack of shared enthusiasm among the Later Users, "It was disappointing to me that we did as much as we did to illuminate the benefits [of ASAPS] and the drawbacks to [the current systems in use], and

it did not win people over." Indeed, Miller and Steepleton were quite proud of the system they had developed and perceived the unwillingness of some Users to embrace the technology as a passive-aggressive indictment of the development team's work. This initial[76] lack of acknowledgement that Users might have worthwhile concerns about the system ultimately reflected a pro-innovation bias[77] among the Change Agents. In particular, Miller and Steepleton's assumption that ASAPS should be adopted focused the adoption-decision process more on the technology and considerably less on the User. Kaye and Little refer to technical considerations dominating diffusion in organizations as "technocratic rationality" (30). Such a rationality among the Change Agents appeared to have contributed to a delay in adoption for some Minnesota Users because it influenced Change Agent sensitivity toward those resisting the technology.

It is important to note here that Mary Palmer foresaw the potential of a negative User response influencing the ASAPS adoption. Having learned at a seminar in the late 1990's that people issues tend to have a far greater impact on technology project failures than technology issues, Palmer required the development team to write a communication plan prior to the launch of ASAPS in 2000. The majority of the plan that was produced, however, was geared toward communication about the technology rather than communication with the Users, in other words, it followed a technocratic rationality. The communication processes detailed in the plan, such as presentations, status reports,

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[76] I refer to this as an 'initial' lack of acknowledgement because Steepleton and Miller eventually did become quite interested in Later User concerns.

[77] Rogers (2003) describes a pro-innovation bias as "the implication in diffusion research that an innovation should be diffused and adopted by all members of a social system" (106).

meetings, and a website, were designed primarily to keep stakeholders abreast of ASAPS development and to explain why and how the system worked. Rogers (2003) describes this sort of innovation-focused information as the how-to knowledge (or the information needed to correctly use an innovation) and principles-knowledge (or the information underlying how an innovation actually works) that is typically communicated during the initial knowledge stage of the innovation-decision process (173). He contends, however, that the enduring attitudes about an innovation actually form during the complex persuasion stage that Rogers claims follow the knowledge stage (174) in innovation adoption processes. While most elements of the ASAPS Communication Plan appeared useful for communicating information about ASAPS, thus contributing to the knowledge of those considering using it, they were not as useful for addressing the User's emerging relationship with or attitude toward the technology. Only one element of the plan, *Brown-Bag Lunch*, appeared designed to specifically address User attitudes toward ASAPS. Scheduled to meet monthly, the brown-bag sessions were intended as informal opportunities "to gain information, offer insights, and participate in a dialog on a variety of topics" concerning ASAPS ([ASAPS] Communication Plan 2). While this study revealed few conclusive details about the evolution of the *Brown-Bag Lunch* concept, the meetings apparently never gained traction and thus had little to no influence on the adoption-decision process during the first few years of the diffusion in Minnesota. In addition to the technology-centered Communication Plan, the 26 page Project Plan for ASAPS (written in 2000), included only two pages devoted to actual transition strategies.

Similar to the technology-centered Communication Plan, the predominant transition strategy in the Project Plan was the technological preparedness of each diffusion location. Little attention was given to the psychological preparedness of the individuals being asked to adopt ASAPS. In other words, both of the documents (Communication Plan and the transition strategy within the Project Plan) designed to guide and facilitate the diffusion process emphasized technological concerns over people concerns.

Despite Palmer's recognition that people issues were critical to innovation diffusions, the Project and Communication Plans' emphases on the technology rather than the User was indicative of the pro-innovation bias prevalent in the socio-cultural contexts surrounding the ASAPS diffused. This bias resulted in an adoption-decision process emphasizing innovation knowledge more than User persuasion, which diminished the rhetorical clout among the Change Agents. The pro-innovation bias generated by Steepleton and Miller's adamant belief in ASAPS in some ways blinded them to their audience's perspective; consequently, they were less effective than they might have been in their role as persuasive agents and initially had difficulty generating a shared sense of trust in the technology. In addition, having their positive assumptions about ASAPS thrown into question resulted in Miller and Steepleton reciprocating the resistance they perceived from some Users. The adversarial, us versus them, climate that ensued among Change Agents and Later Users in Minnesota ultimately stifled the communication processes necessary for building User trust in ASAPS. Reinforced by the pro-innovation bias of 'official' organizational documents, Miller and Steepleton

approached the diffusion process with a clear bias that helped to shape a socio-cultural context of technocratic rationality. The lack of attention to attitudes among those who did not necessarily ascribe to the innovative culture of the organization contributed to the sense of alienation felt by many Later Users and further compromised the Change Agents' rhetorical agency in promoting adoption.

- *Later User Perceptions of ASAPS*

Some Change Agents' explanations for User resistance to ASAPS, such as Later User's having an irrational fear of the unknown or a lack of innovativeness, rely on one of the most common explanations for adoption resistance – the character of the User. As Klein notes and diffusion scholarship increasingly supports, however, understanding adoption-decision processes based on User labels, such as referring to Early Users as innovators and Later Users as laggards, not only assumes behavioral consistency but also "deflects attention" from deeper understandings (14). Indeed, such character generalizations by of Later Users do not adequately account for the more nuanced contextual influences on why they responded as they did to the innovation, however. The more notable explanations emerging among Later Users actually revolved around not only the technology but also how its implementation impacted their work and conceptions of authoring. Given the highly regulated and time-sensitive nature of the medical device documents they were producing, some Users' primary concern was the functionality and reliability of the system. For example, when asked what his initial thoughts about ASAPS were, David explained that "the adoption of [ASAPS] on any

given project was seen as a risk by the managers of that project. If the case wasn't made for ASAPS effectively, projects were less likely to accept the risk." To the same question, Tom responded, "I was skeptical that it would work as advertised." In other words, ASAPS was unproven, and some were concerned about the broader organizational implications if the system did not perform as anticipated.

The lack of trust among the more resistant Users was not just about the system's ability to satisfy regulations and meet deadlines; however, their concern also had to do with the difficulty they had in articulating their concerns with the system. Brian pointed out that ASAPS was such a profound change to the document writing process that "it was difficult to accurately describe the problems" he had when working with it. Describing the conversion to ASAPS as a "monumental undertaking," Brian was a proponent of continuing to work with the established tools that were already familiar to most writers[78] rather than adopting an entirely new system. Indeed, just a few years before the launch of ASAPS Palmer had mandated that all of the technical writers use the same authoring tool, FrameMaker, and she acknowledged that learning an entirely new system only a few years prior might have created "change fatigue" among some of the writers. Palmer noted, however, that the writers had quickly recognized how FrameMaker benefited their writing processes and that any advantages of ASAPS were not as apparent because "the interruptions we ask writers to deal with are really hard and the tool in some ways

[78] A newer version of FrameMaker had been released, and Brian believed it was a better choice for single sourcing. He pointed out that "All of our existing manuals were in FM and I thought it would be less disruptive and less expensive to go in that direction."

increased that…[working in ASAPS] is like trying to do three dimensional chess." In fact, the concepts of single sourcing and modular writing were so novel at the time of the ASAPS launch that most Users did not yet have a coherent vocabulary for talking about the process. The difficulty many writers had in both conceptualizing and talking about the system, particularly in Minnesota, did little to foster a belief that ASAPS was the right technology choice; in other words, distrust in the system itself hindered the adoption-decision process of a number of Users in Minnesota.

The profound changes ASAPS brought not only to the writing of technical documents but also to the meaning of authoring further influenced the adoption-decision process in Minnesota. While most of the Users appreciated the business reasons for adopting ASAPS, James pointed out that authoring with the new system meant "inventing the nonexistent work processes [which made] the unknown cognitive load on writers a huge challenge," even for those who embraced the change, such as himself. Kastman-Breuch's (2008) study of the impact single sourcing had on documentation review found that technical "writers experienced changes such as a streamlined, structured writing process and collaboration with reviewers on the development of content" (353). These changes in writing practices shifted the concept of authoring from that of an autonomous "lone writer" to more of a collaborator and negotiator of processes (353). In other words, although Kastman-Breuch found an increase in perceived authority among authors as a result of contributing their writing expertise during collaborations, they also felt a reduced sense of authority, or author agency, as single

sourcing diminished their role as independent writers. Similarly, ASAPS Users found that the new processes for entering metadata, composing text in modular form, and sharing modules with other writers brought additional layers of complexity and a perception of less individual control in performing their job. As Paul, another Early User, explained, the shift to a more collaborative writing model meant writers were being asked to forego their accustomed "freedom to select different computer types and desktop publishing tools" to better control the look and feel of what they produced. Indeed, adding to the loss of choice in selecting the best tool to meet their individual needs, was the fact that ASAPS represented a profound shift in what it meant to be a technical writer at GMDC. A number of writers commented on the loss of individual agency in the multiple author framework.

Noting the profound shift to writing, Mary Palmer pointed out that in adopting the single-source content management system, technical documentation at GMDC essentially "went from sort of a craftsman style model…to a more manufacturing model [and] a lot of people didn't want to go there." Far from being assuaged by promises of more content control and less menial work, Later Users in particular perceived the impending changes both to authoring and document production with distrust. David's comment summarized the reactions of many Users over the impact ASAPS would have on their work:

> "For them, the transition to [ASAPS] was a mandate from on high that was to be avoided for as long as possible. We were being asked to adopt a new, unfamiliar

> way of doing our work. It promised to make doing our job harder, and in the end, to produce manuals that didn't look as good as the hand-crafted books we were used to writing."

In sum, what appeared to have been even more integral to User resistance in Minnesota than distrust in the system's capabilities, were the profound changes it heralded for technical writing processes.

An additional hindrance in accepting the technology, particularly among Later Users, was the perspective that ASAPS was principally designed to reduce translation costs rather than improve writing processes, as evidenced in Tom's argument that "too much emphasis was placed on the translation benefits of [ASAPS], and not enough emphasis on making [it] a user-friendly tool," and David's comment, "I was largely unconcerned about the primary drivers behind [ASAPS] – the reduction in translation workload and the ability to provide an audit trail for the development of English content." In other words, the sense that ASAPS benefited translation at the expense of technical writing among some of the Minnesota Users further alienated them from being persuaded that the ASAPS adoption was necessary. Exacerbating the resistance to ASAPS, then, was the perception that they were being asked to shoulder a great deal of uncertainty and change for the benefit of others in the organization, which resonates with Munir's claim that shared understandings are important when incorporating new technologies in an organization (1404). Linking this to Sproull and Kiesler's view that innovation diffusion

is transformative by nature and that successful implementation is driven by organizational, rather than just individual or team, learning, the responses of Later Users suggest that they did not initially appreciate the broader, organizational impact of ASAPS. David's response to what changed his thinking about ASAPS speaks to the influence an organizational culture of shared understanding can have on adoption-decision processes, "It was important for us to understand the pain our old processes and tools were creating for [the translation] group." In other words, once the writers in Minnesota understood their role in the broader transformation of the ASAPS diffusion, they were more inclined to accept it.

- *Early User Perceptions of ASAPS*

In contrast to the Later Users in Minnesota, the Early Users in both the Netherlands and Minnesota appeared more open to trusting ASAPS capabilities and felt less threatened by the changes it brought. Despite some preliminary skepticism, the translators in Limberg expressed curiosity in the technology and an openness to learning how to use it. Marc, an Early user in Limberg, was at first reluctant to disrupt the work environment, but his thoughts about ASAPS were, "we will see how this works out, if it's easier than using FrameMaker, why not?" And his colleague Irene commented that "this new tool sounded like something very new and very advanced that could help us a great deal." Indeed, Marc, Irene, and others in the Limberg offices quickly became supportive of ASAPS when they realized its advantages for translation. When asked how ASAPS impacted the work that she did, Irene responded:

> "It made a great change in the WAY of working…in the beginning, of course, it was very much trial and error, so it wasn't clear that [ASAPS] would eventually save us time and make things easier. However, once this was becoming clear, it was easy to adapt to the new way of working."

In other words, the changes ASAPS brought to translation processes were quickly recognized and perceived as positive by the Early Users in Limberg.

In contrast to the Early Users in the Netherlands, the initial perceptions of ASAPS among Early Users in Minnesota were quite varied. On the one hand, some expressed a sense of neutrality because it was such an unknown to them. For example, Susan, an Early user, explained, "I did not have strong positive or negative feelings towards [ASAPS] initially, I just thought I'd think about it more when it became concrete." On the other hand, others embraced the concept immediately. When asked what her initial thoughts about ASAPS were, one of the first Users, Julie, wrote, "It's about time! Tech Comm. desperately needed some kind of single sourcing/repository solution for its ever growing documentation writing, standardizing, and controlling needs." Although the levels of excitement about the innovation varied, what was common among all of the Early Users in Minnesota was a general receptiveness and willingness to try the new technology. In other words, they appreciated why the system had been developed and were open to learning it. Additionally, Early Users in Minnesota were more apt to describe the changes ASAPS brought to writing processes in a positive light. Julie

described the impact of the technology in this way, "[ASAPS] enabled me to work more efficiently and concentrate only on new content rather than needing to review an entire book," and Susan said, "I thought it was easy to use, reuse was a good thing, and having a database to track changes was great." Similar to the reactions of the Users in Limberg, the Early Users in Minnesota demonstrated a curiosity in learning about the system, with little evidence of distrust toward the technology.

By the time it diffused to Gelderland, ASAPS was already in use both in Minnesota and Limberg. As Steepleton pointed out about the transition at the Dutch subsidiary, "[ASAPS] was more mature [and] we had a story to tell." Indeed, by late 2002 when implementation began in Gelderland, ASAPS was better understood not only by the development team but also by many of the writers. Although the technology still represented a profound paradigm shift, single sourcing and content management systems had become more prevalent and conceptualizing how the system worked was less of an issue for those making adoption-decisions in Gelderland. Perceiving the innovation as developed principally for business reasons related to translation, however, the Gelderland Users were particularly concerned that ASAPS would not adequately benefit writing processes. Marjo's initial thoughts about the system were that it was "mainly developed as a translation tool to reduce translation costs. [It was] not developed as a writing tool," and Valerie said flatly, "[At first,] I don't remember seeing any advantage for the writing team." Early on in the diffusion, the Gelderland Users did not trust the technology to meet their authoring needs; therefore, the meetings with the Change Agents that initiated

the Gelderland diffusion, as well as training with Nelson in how to use the system, were pivotal in shifting the Users' skeptical perceptions of the technology. Valerie remarked that "My thinking changed when I did the first [ASAPS] training course early in 2003. I found the tool so easy to use," and Marjo commented, "When I learned more about [ASAPS] I started to see the advantages for writers, like version control." Once they learned how the system worked and realized the benefits for authoring, the Gelderland Users quickly became proponents of adopting the innovation. In this particular case, the socio-cultural context allowed for increased awareness of and knowledge about the technology, as well as greater rhetorical sensitivity from Change Agents who were better prepared and more receptive to addressing User concerns about the technology. This more advantageous context contributed to an adoption-decision process that led to nearly uniform acceptance of ASAPS in Gelderland.

- *Influence of Technology-Centered Contexts*

A principle socio-cultural factor influencing User response to ASAPS in Minnesota was the pro-innovation bias that permeated the organizational culture[79] of GMDC and was reflected in the perspective of the Change Agents. Those who were curious and willing to learn about the technology fit the cultural expectation and subsequently were incorporated into the implementation process. Referring to the Users

[79] This is perhaps best evidenced by the fact that GMDC has long been a top innovator in the medical device field and has been recognized as one of the 50 Most Innovative Companies in the world. As Rehling points out concerning the transition to new technologies, "The new does have its own powerful mystique, especially in innovation-proud environments" (33)

the ASAPS team asked to contribute to the development, Miller acknowledged, "We chose those people because we knew from talking to them [that they] were open minded, and we just didn't allow the others in the room." In other words, the Change Agents affirmed those who fit the expectations of the pro-innovation culture by working closely with them during the later stages of development and early on in the implementation of ASAPS, while those who did not fit the cultural expectation were essentially shut out of these initial diffusion processes. This dynamic of culture expectation and who is given agency in organizational diffusion processes speaks to Kinsella's point that "the locus of agency has shifted increasingly from the individual to larger systems of power/knowledge" (41) in organizations. In other words, by privileging one perception over another, the power structures of the organization granted agency to Early Users during the adoption-decision process and denied it to Later Users. The technology-centered context, therefore, gave legitimacy and a voice to more trusting perceptions of the innovation, and by not legitimizing a space for dissent, in essence silenced those not immediately trusting the technology. Consequently, Later Users were at the whim of whatever was created by those empowered to develop the system.

Perhaps this explains why so much emphasis was given to the knowledge stage during the early stages of the adoption-decision process in Minnesota. Given the degree of change ASAPS brought to authoring and translation, the Change Agents expended considerable effort to explain how the system worked and to train people in using it. Because the support for innovation in general was so pervasive among the Change

Agents and within the broader organizational culture, however, communication about ASAPS tended to linger on clarifying how the system functioned and dispelling misperceptions about its complexity. Even when concerns were eventually and satisfactorily acknowledged (e.g. Both Early and Later Users repeatedly noted that Steepleton and Nelson were effective listeners), the assumption among Change Agents that the innovation should be adopted made it difficult to fully value and responsively adapt to the more negative input. The "communicability of the moment" (Doheny-Farina 10), therefore, was compromised by a socio-cultural context that initially devalued perspectives that ran counter to the cultural expectation. Over time, however, the Change Agents adapted with greater rhetorical sensitivity by becoming more responsive to audience interests when negotiating the innovation/User relationship. It could be argued that as technical communicators, the Change Agents were particularly adept at surveying the rhetorical situation; therefore, when they recognized the issues they shifted their communication emphasis from technology-centered knowledge to more of an audience-centered persuasion. In other words, the rhetorical dynamic that developed in Minnesota (and appeared to exist at the front-end of the Gelderland diffusion) apparently had a greater influence on User adoption (particularly the Later Users in Minnesota) than the more one-directional delivery of "rational information" (Doheny-Farina 10) approach fueled in a large part by a pro-innovation bias. As the next section of the analysis suggests, the rhetorically sensitive User/Change Agent relationship that emerged during

the persuasion stage of the adoption-decision process ultimately changed the dynamics of agency as well as Later User perceptions of ASAPS.

Voice – Agency/Role in the process

At this point in the analysis, isolating the influences of agency during the adoption-decision process is problematic because issues of agency, or the confluence of intentionality and a capacity to act (Winsor 417), permeated virtually every aspect of the ASAPS diffusion process that have already been discussed to this point. Indeed, issues of agency (which I refer to as having or not having a voice during the adoption-decision process) were most apparent in the analysis of change and management influence, as well as in shifting perceptions of trust in the technology. While the earlier discussions of agency tend to emphasize how a lack of empowerment hindered the adoption-decision process, the final section of the analysis specifically highlights the ways in which agency enhanced the adoption-decision process.

- *User Perceptions of Agency in Minnesota*

What this analysis overwhelmingly suggests is that perceptions of agency, particularly among the Users in Minnesota, had a pivotal influence on their response to the ASAPS diffusion. Those who contributed early to the development and implementation of ASAPS remarked that the influence that accompanied their involvement gave them a “voice” in the process. Julie, an early proponent of ASAPS,

was involved in discussions about which projects to phase-in to the system and remarked that she "had a lot of input" in the direction ASAPS would take. As has already been discussed, however, those who did not initially participate in the ASAPS project were far less likely to embrace the innovation. In addition to not being invited to participate, Later Users felt their opinion or voice was not welcomed by the Change Agents. As Tom lamented, "During the early development…the ASAPS team seemed aloof and did not want input from writers on how to develop the tool." In other words, Later Users perceived an imposed lack of agency in influencing the design of the tool they were being asked to adopt; therefore, they did not participate in the legitimized meaning making surrounding ASAPS creation. The shift that brought greater agency to those resisting adoption came when Paul, an early User himself, stepped in to help direct the development of the *processes*[80] within the ASAPS system. Throughout the development process, the Change Agents believed the writers should determine their own *processes*, as Miller recalled, "we had the general notion [that] the writing teams were supposed to own the processes."[81] Nonetheless, this area of ASAPS remained undeveloped and a point of contention between Change Agents and writers until Paul recognized the need and began addressing it with the help of other writers in the department. By illuminating an aspect of ASAPS that was hindering adoption decisions, Paul invited the writers to participate in

[80] *Processes* referred to how content would be developed within the ASAPS framework. It was at this point in the ASAPS development that the additional category of *Topics* (a broader level of content categorization into which more specific modules were placed) was added to the system.

[81] It is not clear from the data how vocal the Change Agents were about putting the writers in charge of this area of development, particularly among the writers. From what I was able to determine, until Paul became actively involved, the writers did not believe the Change Agents welcomed their participation.

adapting ASAPS to better meet their needs. When asked what changed his thinking about ASAPS, David, a Later User, remarked, "[The Change Agents] seemed to take my input seriously and make an honest effort to implement my suggestions into the design, which helped me feel part of the process." Steepleton reflected on how instrumental collaborating with the writers on the *processes* had been to the overall diffusion of ASAPS, "[Paul] provided that piece and that was huge, I think, to getting the amount of acceptance that we have now [for ASAPS]." In other words, Paul's initiative gave voice to the concerns of Later Users which empowered them to contribute to the innovation's meaning making within the organization. The result was a shift in perspective during the adoption-decision process.

An additional opportunity for Users to have a voice in the process came in the form of a User support group, formed in late 2003, that was designed to get people talking about the system. According to Nelson, this group of Users was started by a woman[82] in the department with experience in helping users adopt new technology and was not connected to the ineffective Brown Bag lunches originally called for in the Communication Plan. Nelson commented that this group was instrumental in giving "a vehicle for users to communicate requirements or enhancements, or problems to the [ASAPS] team and for the [ASAPS] team to have a group to bounce off ideas…it was also an opportunity for Users to learn from each other, to share tips and tricks." Why this group was successful in giving a voice to more resistant Users and the Brown Bag

[82] Unfortunately, this individual was not available to participate in the study. Also, Palmer was the only one to mention her name during data collection.

lunches were not is not clearly identified in the data; however, elements in the socio-cultural context do emerge that help to explain the different impact of each group. As part of the Communication Plan drawn up by the ASAPS team, the Brown Bag lunches were an entity of the pro-innovation culture inherently supporting ASAPS development. In other words, the lunches might have been perceived as 'one of them.' Considering Zachry's point that broader organizational structures during diffusion processes can result in reduced individual agency manifested in self-regulation and suppressed opinions (vi), it is perhaps not surprising, then, that the lunches were ineffective. In contrast, the User support group that later developed was the brainchild of and run by Users themselves, which afforded the participants a degree of agency not found within the management mandated Brown-Bag lunches. As a result of increased participation by more resistant Users, technological adaptations were made to the technology that better met User needs. In other words, Users felt their concerns about the technology were at last being addressed. Rogers (2003) refers to innovation changes that occur during diffusion processes as re-invention[83] and notes that the flexibility it brings to innovation decisions "may reduce mistakes and encourage customization" (185) that enhance the desire to adopt. Therefore, as shifts within the socio-cultural context afforded Users greater agency during the adoption-decision process, a space for influencing the system's development was created and acceptance of the innovation was enhanced.

[83] Rogers defines re-invention as "the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation" (180).

- *Change Agent Perceptions of Agency*

As previously discussed, the socio-cultural context had given the Change Agents little sanctioned power to influence User decisions; therefore, they had to rely on their rhetorical skills to give them influence during the adoption-decision process. It was in their ability to assess and adapt to the rhetorical situation that they found the voice to more effectively influence the perceptions of resistant Users. While Steepleton perceived some adoption-decision agency in her role as a system developer, which gave her "the ultimate leverage on what [got] changed in the system," she also recognized her agency in understanding and responding to User needs, "so I [tried] to listen with a very open mind." Believing that her role as trainer gave her an influential voice during diffusion, Nelson nonetheless emphasized the importance of adapting to User needs and understanding "the User's perspective, how they're going to use the system, watch them do their job and make sure the training and support reinforces that…and not to assume I understand how they're using it - but to watch." In other words, both Steepleton and Nelson acknowledged not only their own agency, but also User agency in the reciprocity necessary between Change Agent and User during adoption-decision processes. For his part, Miller also appeared to acknowledge the relevance of User agency during diffusion processes, particularly in his reluctance to design the writer's processes within ASAPS. While perhaps not cognizant of it at first, it was his resistance to controlling this aspect of the ASAPS design that ultimately opened the window of agency for the Later Users. Miller pointed out:

> "[Palmer] repeatedly tried to get us to own it [the processes], we owned everything else, well why can't you own the processes too? And I absolutely insisted, we cannot own the processes. The writers need to own the processes."

As evidence by the collaboration and reinvention that marked the beginning of the diffusion in Gelderland, the lessons learned in Minnesota about shared agency in the development and diffusion of innovations carried over to further diffusion processes. This analysis suggests that a sense of early influence or agency in the ASAPS diffusion resulted in the relatively swift adoption-decisions of Early Users, while a lack of perceived agency among Later Users created the space for resistance. Indeed, in both Minnesota and Gelderland, perceptions of agency were pivotal to how Change Agents influenced and Users responded to ASAPS adoption-decision processes.

CHAPTER 8: Conclusion

A decade after the start of the ASAPS project, single-source content management systems are quickly becoming the norm for technical documentation.[84] In fact, many now entering the field will only know technical writing as a collaborative, modular-based process. At the dawn of the 21st Century, however, systems such as ASAPS were challenging the established norms of technical communication and the very meaning of authoring. While the relentless waves of technological advancement may be accepted as imperative to human progress, there is that moment during the transition to innovative technologies when we have not yet "abdicated our understanding of reality to the terms of the technical system" (Miller 233). By examining such a moment or juncture of change, this study contributes to our understanding of what influences how we respond to revolutionary technologies, particularly among those whose work positions them squarely at these junctures. The experiences of technical communicators in this study, functioning either as Users contemplating, or Change Agents promoting, the adoption of ASAPS, remind us that the acceptance of paradigm-shifting innovations is far more complex than sequential models of innovation diffusion that emphasize overcoming barriers through knowledge about the technology. By Rogers' (2003) own admission, the transition from knowledge to decision, what I have been calling the *adoption-decision process*, is not well understood (198). Building on the groundwork of scholars who argue that innovation diffusion is an inherently rhetorical process, this study therefore addresses the

[84] By 2007, one year after the end point for this case study, there were nearly 2,000 unique systems worldwide (Rockley 2007, Doyle).

more nuanced complexities of socio-cultural context and individual agency influencing this pivotal juncture in time. A blended theoretical perspective that begins with Rogers and incorporates contextual elements of activity theory, the culture dimensions of Hofstede, as well as the critical lens of cultural studies, has identified a confluence of factors that impact adoption decisions. While these findings in many ways corroborate what is already known about innovation diffusions, they also expand upon our understanding of the reciprocal influence and meaning making that constitute adoption-decisions, and at the same time, they illuminate the ways in which technical communicators influence the persuasive process.

The ASAPS case offers a unique opportunity to examine why some Users are inclined to adopt an innovation quickly and why some are more resistant.[85] While the influences on the adoption decisions of Early Users (discussed in chapter 7) are certainly noteworthy, they tend to support the already plentiful scholarship on what contributes to successful innovation diffusion. The richer area of discussion in this case is the factors that influence later adoption decisions; therefore, my concluding remarks will emphasize these aspects of the ASAPS diffusion. First, it is important to establish that this study substantiates recent scholarship claiming that early and later adoption-decisions cannot simply be attributed to personality characteristics. While early adopters might be more open to change, as some Early Users of ASAPS described themselves, and later adopters

[85] As already explained, the Early Users of ASAPS adopted it within one year of becoming aware of the system while Later Users took two or more years to fully accept the technology.

might be more skeptical of it, as some Later Users of ASAPS acknowledged, relying on such simplistic descriptors to explain why people respond as they do to the introduction of an innovative technology ultimately places the onus of the adoption-decision on the individual and misses the often more subtle implications of culture and agency that are illuminated in this study. More to the point, the tendency to view resistance to technology change as a flaw of personality (as the Change Agents in this study were inclined to do) is not only driven by an inherently pro-innovation bias of those promoting diffusion (Rogers and Shoemaker 1971) but also by the societal norm of ongoing technological improvement. As Mowshowitz (1976) explains, modern society has "cultivated a special relationship to technology wherein needs and conflicts are almost invariably formulated as technical problems requiring technical solutions" (256). This relationship has resulted in the pervasive assumption that advances in technology are both prized and inevitable. Commonly referred to as the technological imperative (Chandler 2000), this phenomenon has imbued technology with its own ethos of rationality and power that often trumps more human considerations (Miller 1978, Katz 1992). Consequently, individuals who resist technological change are pushing against a socio-cultural "ethos of technology" (Katz 267) which places their concerns, if even acknowledged, below the more valued 'concerns' of the innovation. As the ASAPS case demonstrates, such technological rationality often shapes the meaning Change Agents ascribe to User reactions during diffusion. To borrow from Hofstede, the Change Agents are programmed by the socio-cultural context to interpret User resistance to innovative

change as a weakness that must be overcome. What follows is a summary of my findings as they relate to the study's research questions.

Research Questions

1. How did socio-cultural context and agency influence the adoption-decision process among technical communicators and translators?
2. In what ways did the technical communicators on the Development Team influence the adoption decision process? What were their roles and/or functions during the process?

Influence of Socio-Cultural Context

- *Impact of the Technological Imperative*

The technological imperative infusing the socio-cultural context of the ASAPS diffusion is particularly apparent in the Minnesota adoption-decision processes. Even without a conclusive adoption edict from management, the organizational context in Minnesota was decisively technology-focused. The company's Communication Plan and Project Plan, which structured the implementation processes, as well as the efforts of the Change Agents, were predominantly concerned with generating knowledge about the technology. In other words, the organizational meaning making during innovation

diffusion was centered on the ethos of ASAPS rather than the response, or pathos, of individuals being asked to adopt it. Given the profound changes ASAPS brought to authoring and documentation, however, conflicting meanings emerged from Users. Those who aligned themselves with the pro-innovation bias of the socio-cultural context participated in the positive perceptions of ASAPS, thus their interpretation or meaning for the technology was legitimized. In contrast, the perceptions of those who did not align themselves with the technological imperative during the adoption-decision process had their meaning making delegitimized by the socio-cultural context. Potentially quite valid concerns about the broader implications of ASAPS for the work of technical writers, therefore, were subsumed by the more culturally acceptable meanings of efficiency and standardization.

What we learn from this is that an organizational emphasis on technological preparedness, or what Rogers calls the knowledge stage of innovation decisions, can result in insufficient attention being given to the psychological preparedness, or persuasion, of the people being asked to adopt the innovation. While both knowledge about an innovation and the conviction that it is the right choice are integral to innovation diffusion, this study demonstrates that an emphasis on knowledge at the expense of persuasion can hinder the adoption-decision process. In other words, being informed about a technology is not enough to persuade someone to use it. Interpreting this from the classical rhetorical perspective, concentrating on the ethos of the technology and the logos (or rationale) for its adoption risks inattention to the pathos of those considering

adoption. Such an understanding throws Rogers' concept of sequential stages to the innovation decision process into question. While awareness of a technology's existence is arguably necessary before one can form an attitude toward it, making a distinction between gaining knowledge about an innovation and forming an opinion of it disregards the rhetorical interrelationship of ethos, pathos, and logos in the adoption-decision process. In other words, technological preparedness and psychological preparedness are not mutually exclusive, sequential constructs. Additionally, a pro-innovation bias that fosters technology-focused meaning making can result in legitimizing some interpretations over others, thereby hindering acceptance by Users not wholly convinced of a technology's imperative.

- *National Culture and Management Style*

Management's influence during the adoption-decision process was another critical element of the socio-cultural context in the ASAPS diffusion. This case suggests that national culture indeed plays a role in the influence management has on User response to innovations. For example, the emphasis by Dutch management on collaboration and consensus seeking contributed to a uniform sense among Gelderland Users that they participated fully in the meaning making surrounding the ASAPS implementation. In contrast, the more hands-off approach taken by Palmer in Minnesota helped to create a sense among Users that the decision to adopt ASAPS was theirs to make. As discussed in chapter 7, national culture differences in masculinity and femininity appeared to influence U.S. and Dutch management approaches to, and User perceptions of, the

adoption-decision process. Indeed, Elteren notes that "dissimilarities that exist between Dutch and American culture become manifest especially in the different views managers have on participation…Dutch managers value working individually much less than Americans" (49). In other words, Dutch management appeared to reinforce a socio-cultural context that values collaborative decision making, thereby enhancing a shared adoption-decision process among the Users, while Mary Palmer's less decisive involvement in the adoption-decision process reinforced a socio-cultural context that valued more individualized, less collaborative decision making. While these conclusions are limited by a lack of in-depth information on the management cultures in both the U.S. and the Netherlands, they do suggest that broader national culture, particularly in the area of masculinity/femininity can play an influential role in how management and Users approach and respond to the adoption-decision process.

Influence of Agency

- *User Agency as both Active and Passive*

Mary Palmer's approach to the innovation diffusion process in Minnesota had a noticeable effect on the ways in which agency played out for both Users and Change Agents during the adoption-decision process. By not taking a more decisive role in promoting ASAPS' diffusion, Palmer allowed a space during the adoption-decision process for Later Users to resist the technology. Essentially silenced by a pro-innovation

bias that denied legitimacy to their perspective, not to mention their difficulty in adequately talking about the new technology, Later Users gave meaning to their perceptions of ASAPS through their open resistance to it. Drawing on Tyre and Orlikowski's explanation of early resistance to implementation as a "window of opportunity" for understanding how and why people respond as they do to innovations (1994), the lack of contextual adoption cues from Palmer opened a window of agency for those who initially were uncertain about ASAPS. By appearing somewhat aloof, Palmer allowed for a "conjunction of opportunities" (427) that ultimately empowered the delegitimized meanings of resistant Users to exist as alternative interpretations. The ASAPS case, therefore, demonstrates that agency or the capacity "to make something happen" (Winsor 417) during innovation diffusion can occur not only through active participation in the process, as in the Early Users who contributed to the pro-innovation perceptions surrounding ASAPS, but also in silent resistance to the meanings others ascribe to it. As attitudes toward an innovation form, User agency can therefore be employed both actively and passively during adoption-decision processes, particularly when elements in the socio-cultural context open a window of agency for that resistance. Identifying these multiple potentials for User agency informs Mantere and Sillince's claim that locating agency only in those who implement an innovation "may have serious repercussions for at least commitment and control" (414). Additionally, these findings bring into question Zachry's claim that speech self-regulation and conflict avoidance during innovation diffusion reflect a lack of individual agency (vi). Indeed, the ASAPS

case demonstrates that when a window of agency exists during the adoption-decision process, resistant Users might actually find some empowerment in their silence.

- *Management Influence on Change Agent Perceptions of Agency*

Palmer's influence on agency in the adoption-decision process in Minnesota also can be seen in the degree of agency perceived by the Change Agents. Despite the pro-innovation context, the Change Agents felt that the lack of a strong adoption mandate from Mary Palmer, coupled with the lack of public recognition for the system they created, left them with little ascribed power to make adoption happen in Minnesota. In contrast, the Change Agents felt a greater sense of empowerment in both Netherlands locations in part due to management's influence in creating a pro-adoption environment. Without this sense of socially sanctioned agency in Minnesota, the Change Agents were compelled to rely on their own rhetorical skills to generate agency and influence adoption decisions (I discuss this at greater length in the next section). What this finding demonstrates is the importance of management or perhaps more specifically, Champion, support for generating a sense of agency among Change Agents during innovation diffusion. Rogers describes a champion as "a charismatic individual who throws his or her weight behind an innovation, thus overcoming indifference or resistance that the new idea may provoke in an organization" (414),[86] and argues that support from such an individual is critical for successful innovation diffusion in organizations, particularly

[86] While Mary Palmer might be legitimately perceived as the Champion of ASAPS, I hesitated giving her this label because she did not adequately fit Rogers' description. Palmer was 100% supportive of ASAPS, but by shifting attention to other projects, she essentially 'dropped the ball' on helping the Change Agents to overcome the resistance to ASAPS.

when a technology is "highly uncertain" (415). Rogers' discussion of these individuals in terms of their impact on the effectiveness or agency of Change Agents is limited, however. The ASAPS case therefore expands our understanding of the manager/Champion role in shaping agency by suggesting that he or she can contribute to Change Agents' sense of empowerment during adoption-decision processes.[87]

Influence of Technical Communicator as Change Agent

- *Rhetorical Agency of Change Agents*

Some of the more useful insights that emerge for technical communicators from the ASAPS case involve the influence of Change Agents during the adoption-decision process. Specifically, this study demonstrates the degree to which technical communicators as Change Agents function not just as bridging agents between technologies and its various users (Ornatowski 599) but as rhetorical agents in the reciprocal meaning making that constitute innovation diffusion processes (Doheny-Farina 6). Indeed, the Change Agent's influence during the ASAPS adoption-decision process affirms Hart and Conklin's (2006) study of an emerging model for technical communication in which they claim that technical communicators bring value to organizations "through the processes they manage or impact, through the relationships they create and manage, and through their ability to bring a diverse skill set to the aid of

[87] Unfortunately, my data was insufficient for determining if the management/Champion had an influence on User perception of Change Agent agency.

numerous organizational endeavors" (412). The overarching influence of Change Agents during the ASAPS diffusion was in developing adoption conducive relationships among Users, or to use Russell Kahn's term for these critical organizational connections, "alliance building." While the Change Agents eventually built strong alliances with Users across organizational contexts, some of the relationships evolved more readily and uniformly (in Gelderland and Limberg) than others (in Minnesota). The disparities in relationship development encountered by the Change Agents demonstrate how socio-cultural factors and issues of rhetorical agency shape alliances and the subsequent degree to which Change Agents might influence adoption decisions.

- *Impact of a Pro-Innovation Bias*

One of the more notable findings is that a pro-innovation bias can have an inhibiting effect on rhetorical agency. If agency is understood to be socially located and "contingent on a matrix of material and social conditions" (Herndl and Licona 138), then it follows that the technological rationality surrounding the ASAPS diffusion might have contributed to a sense of empowerment among the Change Agents to affect adoption decisions. Instead, the Change Agents' rhetorical agency appeared to be compromised by their role as purveyors of the technological imperative. In other words, a pro-innovation bias limited the Change Agents' ability to appreciate why some resisted the technology, which essentially shielded them from effectively responding to the subtleties of pathos and meaning making influencing the adoption-decision processes of Later Users. Supported by a culture of technological rationality, then, Change Agent interactions with

the Users emphasized the ethos of the technology rather than the pathos of the User. Compounding this were the socio-cultural factors of different communication styles and the perception that the Change Agents were outsiders, which supports Coppola's point that the ethos and motivations constituting innovation diffusion "amount to a communication effort between what are essentially different cultures" (11). These disconnects between Users and Change Agents resulted in a lack of mutual empathy that ultimately hindered the reciprocal "negotiating and sharing of perspectives" that Doheny-Farina describes as central to successful innovation diffusion (10). The consequence of these initial, poorly developed alliances for the Change Agents was a loss of rhetorical agency in convincing Later Users they should adopt ASAPS. By illuminating how a pro-innovation bias coupled with multiple perceptions of culture difference can hinder Change Agents' ability to engage some Users in reciprocal meaning making, this case expands our understanding of the ways in which technical communicators might be less influential than one would expect during the adoption-decision process.

Indeed, the evolution of relationships between Change Agents and Users during the ASAPS diffusion affirms the growing body of scholarship emphasizing the rhetorical nature of not only innovation diffusion, but also of the role of the technical communicator. Uniquely qualified to navigate the subtle "movement and flow" of language and culture that constitute diffusion processes (Coppola 288), technical communicators are not simply bridging agents who overcome barriers in the transference of information or knowledge about innovations to potential users. Rather, as this study

demonstrates, they are participants in a "continual conceptualizing, negotiating, and reconceptualizing" of meaning about an innovation (Doheny-Farina 4). As the Change Agents' rhetorically sensitive adaptations in each diffusion location suggest, technical communicators are indeed skilled at navigating the rhetorical complexities of the adoption-decision process. Additionally, this study suggests that the greater agency for influencing adoption-decision processes actually lies within the Change Agents themselves rather than in the broader organizational power structures. As previously discussed, Change Agents also played a role in influencing User perceptions of agency, particularly among those who resisted adopting ASAPS. By shifting away from the knowledge emphasis and employing a greater rhetorical sensitivity with Later Users, which eventually led to re-inventing aspects of ASAPS to better meet the needs of writers, the Change Agents created an environment conducive to the mutual meaning making that Doheny-Farina and others argue is so central to innovation diffusion. Through the reciprocal influence that developed, the alternative perspective was legitimized, thereby empowering Users to contribute their own meaning to the innovation. In other words, Users found agency through the reciprocal meaning making that gave legitimacy to their perceptions of the innovation. The ASAPS case suggests, therefore, that by engaging their rhetorical agency during innovation diffusion, technical communicators can empower Users to participate more fully in the adoption-decision process.

Implications for Innovation Diffusion and Technical Communication

Although much of what was learned in this case corroborates what is already known about innovation diffusion, the ASAPS story does offer insight into the less well-understood aspects of adoption-decision processes. While the case study approach does not support a discussion of these findings in more encompassing terms, given the research questions' broader concerns for scholarship in technical communication and innovation diffusion, this case does function instrumentally to inform our understanding of adoption-decision processes. Therefore, I approach the final section of my conclusion using Stake's perspective that case study research seldom can be generalized as "entirely new understanding" but that it can contribute to a "refinement of understanding" (7). Considering the ASAPS case in this vein, I now briefly summarize those findings that further refine our understanding of agency, socio-cultural context, and technical communicator influence on adoption-decision processes.

Technical communicators as Change Agents indeed can play an influential role in User's adoption decisions; however, we should not assume that they always possess or exercise the rhetorical agency conducive for influencing User adoption. A pro-innovation bias can be one of the more insidious inhibitors of technical communicators' rhetorical agency in adoption-decision processes. First, it can result in emphasizing User's technological preparedness over their psychological preparedness, thus hampering Change Agent effectiveness in addressing the more nuanced elements of the rhetorical

situation. Second, a pro-innovation bias can limit reciprocal meaning making between User and Change Agent because it legitimizes interpretations that align with the technological rationality of the culture and delegitimizes interpretations at odds with it. Essentially, an unchecked pro-innovation bias can result in distinctions in perspective between User and Change Agent that are difficult to negotiate. Additional distinctions, such as differences in communication style and professional culture, can also inhibit the empathetic, rhetorically sensitive communication that is more conducive to innovation adoption. Despite these potential inhibitors to effective communication and alliance building, however, this case demonstrates that technical communicators can and do engage an internal rhetorical agency in their role as Change Agents.

Of course, Change Agents do not operate in a vacuum; their efforts to convince Users to adopt occur within a complexity of socio-cultural influencers, and this study emphasizes two of the more influential elements: national culture and management style. While national culture is a broad generalization that can overlook the idiosyncrasies of individuals in adoption decisions, this study demonstrates that it nonetheless can have an impact on User response to the diffusion process, particularly as it reflects cultural preferences for a more assertive, individualistic approach versus a more collaborative, consensus approach to making decisions. Additionally, management style can inhibit innovation diffusion despite an overarching culture of technological rationality. It is well known that management style can influence the diffusion of innovative technologies; however, this case illustrates how the lack of a clear management mandate can impact the

sense of agency in both User and Change Agent. On the one hand, a lack of management commitment can open a window of agency that empowers some Users to openly resist adoption, while on the other hand it can diminish perceptions of agency among Change Agents attempting to influence User decisions.

Finally, and perhaps most importantly, this study challenges Rogers' notion of sequential stages in the innovation-decision process, particularly when considering the elements of knowledge, persuasion, and reaching a decision. First, the ASAPS case demonstrates that Users might "decide" to use a new technology before being convinced it is the best choice. Second, attitudes toward a new technology, particularly one that brings revolutionary change, do not necessarily develop as a result of first learning about the system. Although it is beyond the capabilities of this study, here is where Hunsiger's conception of intertextuality and "extra-cultural" elements of economic, political, and historical contexts would inform our understanding of how broader, culturally influenced perceptions of technology interrelate with attitudes that form during adoption-decision processes. Third, placing persuasion after knowledge disregards the complex, persuasive influence of ongoing and shifting alliances that encompass innovations throughout the process of diffusion. As this case demonstrates, understanding adoption-decision processes as sequential can result in emphasizing knowledge about the technology before addressing the psychological response to it.

The ASAPS story is just one example of what transpired among technical writers and translators when single-source content management systems first began to be implemented in technical communication departments. While much of what has been discussed in this project is specific to the ASAPS story, understanding the details of this case enhances what we know about the complex relationship between technical communicators and the adoption of innovative technologies. More specifically, this study refines our understanding of the ways in which agency and socio-cultural context interrelate to influence both the adoption decisions of individuals and the role of the technical communicator in adoption-decision processes. Additionally, and perhaps more poignantly, ASAPS helps us to understand the beginning of a profound shift in technical documentation processes. Indeed, exploring the experiences of individuals transitioning to ASAPS informs our understanding of the very human response to technological change. It was a privilege to hear the often quite personal reflections of those Users and Change Agents caught up in this unique juncture of change, and I sincerely hope that the interpretations put forth in this work adequately reflect not only the significance of the time but also the validity of each experience.

Limitations and Thoughts for Future Research

When I first began conceptualizing this study, I understood that it would be limited by a number of factors beyond my control. Studying a diffusion process that

began nearly ten years before would likely be fraught with inconsistencies that would be difficult to verify. At the same time, because I only had access to those who still worked for GMDC, I risked not learning the perspective of those who might have chosen to leave the company rather than work with the new system. Additionally, while my analysis offers a number of explanations for why the ASAPS diffusion unfolded as it did, the complexity of interrelated elements coupled with the exploratory nature of the study preclude me from attributing an outcome to any one particular factor. In other words, the limitations of this study do not allow for decisive claims of causation. In this section I explain the limitations I recognized at the outset of the work and those that became evident as my research progressed.

Given the historical nature of this study, my analysis relied primarily on individual's recollections of past events. Unfortunately, I only had access to those individuals still working for GMDC. Knowing that the diffusion of ASAPS likely caused a number of people to leave the department and/or the organization, the study was in danger of presenting only the perspectives of those who welcomed ASAPS when it was first introduced. Fortunately, I was able to collect data from enough individuals who initially were reluctant to adopt the innovation that I believe I gained sufficient clarity on that perspective. To further address participant limitations, rather than emphasize the quantity or frequency of responses during the analysis I allowed for meanings to emerge in singular instances and insights. Despite following these precautions to illuminate minority voices, the story would have had even more depth of insight had I been able to

interview individuals who never became users of the technology. Additionally, while the information from those I did have access to provided rich explanations of the ASAPS diffusion, I was cognizant of the fact that the biased perspectives and memory fallibility of the self-reporting format might pull the story in conflicting directions. I attempted to address this by applying multiple coding schemes that invited different perspectives on the data (as detailed in chapter 5), and by incorporating corroboratory evidence from the Project and Communication Plans. In addition, multiple coding approaches helped to illuminate possible researcher bias given that I was the only one coding the data. To keep the data collection uniform in light of travel constraints (travel to Gelderland and Limberg would have been prohibitive), I distributed an online questionnaire for all of the User participants in the study. In retrospect, individual, semi-structured interviews with all of the participant would have garnered even more descriptive responses to the questions. Finally, my access to most of the study participants was limited to just one interview or questionnaire, which impeded my ability to clarify or expand upon some of the answers. While I might have attempted to solicit more information from these 15 individuals, I did not feel it was professionally appropriate to continue to impose on people's time. I did, however, follow up repeatedly with my principle contact, Steve Miller, who had graciously agreed to function in this role throughout the course of the project. Of course, I kept in mind that this meant I engaged one perspective more than any other.

As my research unfolded, a number of limitations (which typically evolved into thoughts for future research) became apparent. First, given the complexity of cultures influencing the ASAPS story, I would have liked to have access to more detailed data on organizational and management culture. While my interview/questionnaire questions included questions about management's influence in the ASAPS diffusion, the questions had to do with perceptions of individual managers and did not provide sufficient insight into actual management styles and structure. Ideally, I would have interviewed higher level managers in all three locations. Next, I had already collected the participant data by the time I discovered Hunsiger's article on cultural identity; therefore, I was unable to garner the information necessary for examining how this aspect of culture influenced adoption-decision processes. Exploring culture at a more individual level would have given greater insight into emerging conceptions of identity and culture in a more fluid, intertextual world. Also, in addition to their thoughts about ASAPS, it would have been helpful to know how the Users felt about technology in general. Might their response to ASAPS have reflected a more pervasive view of technological change? Finally, the ASAPS diffusion is comprised of multiple, complex layers of culture and agency that were difficult to contain in one analysis. Further areas of exploration might include the role of trust and cultural identity in adoption-decisions, as well as how cultural identity influences a sense of agency in the process. Given the findings that suggest knowledge and persuasion are not mutually exclusive stages, further research could examine the ways in which they interrelate during adoption-decision processes. Finally, more

theoretically substantial rhetorical analyses are warranted if we are to truly unpack the rhetorical nature of innovation diffusion. To that end, applying Habermas' conception of technocratic rationality or Foucault's conceptions of power and resistance to issues of context and agency in the ASAPS diffusion would offer an intriguing start.

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Appendix A: Study Participants

Note: Age reflects how old each User was in the year 2000.

Early Users (Minnesota)

Julie – 41 years old, was a *technical writing team manager* during the early transition to ASAPS from 1997 to 2002. From 2002 to 2004 consulted directly and extensively with the ASAPS team on transitioning projects into the new system. Julie was fully supportive of ASAPS when she first became aware of the project.

Paul – 48 years old, was initially a *technical writing manager* of software writers not transitioning to ASAPS. After a reorganization, Paul was made the manager of a team authoring device manuals, which represented the largest percentage of content in the ASAPS system. Paul was fully supportive of ASAPS when he first became aware of the project.

James – 43 years old, was a *technical writing supervisor* throughout the transition to ASAPS. James was responsible for evaluating, training, and overseeing the work processes of a team of 4 to 5 writers. James became fully supportive of ASAPS within one year of becoming aware of it.

Susan – 36 years old, was a *technical writer* during the transition to ASAPS. She became fully supportive of ASAPS within one year of becoming aware of it.

Early Users (Gelderland)

Valerie – 41 years old, was a *senior technical writer* and responsible for leading the introduction of ASAPS to the department. Valerie became fully supportive of ASAPS approximately one and a half years after becoming aware of it.

Marjo – 38 years old, was a *senior technical writer* and actively involved in converting manuals to ASAPS. Marjo became fully supportive of ASAPS approximately one and a half years after becoming aware of it.

Early Users (Limberg)

Irene – 28 years old, was a *localization coordinator* responsible for the authoring to printing translation cycle of deliverables in multiple European languages. Irene was fully supportive of ASAPS when she first became aware of the project.

Marc – 29 years old, was a *localization project coordinator* during the transition to ASAPS. Marc became fully supportive of ASAPS within a few months of becoming aware of it.

Later Users (Minnesota)

David – 28 years old, was a *technical writer* responsible for gathering information from legacy documentation in the authoring of new and revised content for products in development. David also developed and maintained a departmental intranet, as well as tools for automating and collecting screen captures. David became fully supportive of ASAPS approximately two years after becoming aware of the project.

Tom – 46 years old, began as a *technical writer* during the transition and was later promoted to senior technical writer responsible for coordinating a small team of writers authoring clinician manuals. Tom became fully supportive of ASAPS seven years after becoming aware of the project.

Brian – age not disclosed, was a *technical writing manager* throughout the transition to ASAPS. Brian became fully supportive of ASAPS nine years after becoming aware of the project.

Appendix B

Change Agent Interview Questions

Unless otherwise stated, the following questions are concerned primarily with the transition to [ASAPS] in the[Glederland, Limberg, and Minnesota] locations (i.e. from the moment you introduced it until it was being used on a regular basis in each location). As much as memory will allow, please answer each question with this timeframe in mind. While the [ASAPS] continued to evolve after it was introduced, the focus of this study is the factors impacting the transition to the new system and not the development of the system itself. As part of transitioning to [ASAPS], however, it is worthwhile noting when some factor in the transition process resulted in actual changes to the system.

Name:

Year of birth:

Nationality:

Work location at the time of the [ASAPS] adoption:

Job title(s) during [ASAPS] transition and a brief description of the work you did at that time:

How long had you been with [GMDC] prior to becoming involved with [ASAPS]?

Current connection to [ASAPS]:

1. With which release of [ASAPS] did you become involved in the transition process?

2. How frequently had you worked directly with non-American colleagues (i.e. one-on-one interactions) prior to [ASAPS]?

3. Had you ever been involved in facilitating the transition/adoption of new technology prior to this experience?

4. Please explain your role in the [ASAPS] development and transition process. Was this a new position (i.e. promotion) or in addition to other work responsibilities?

5. What was your view of [ASAPS] in the beginning? Did the transition process change your view in any way?

6. How much control do you feel you had over the transition process? What organizational factors inhibited or bolstered your sense of control over the process?

7. What do you remember most about the transition process in each location you worked with: [Minnesota, Gelderland, Limberg]? Did you notice similarities and/or differences between the locations? To what do you attribute it?

8. Were there key people in each location who inhibited or helped to facilitate the transition? In what ways?

9. What was management's role in the transition process? Did they help or hinder the process in any way?

10. What communication tools did you use during the transition and why did you use them (i.e. phone, email meetings)?

11. If the transition to [ASAPS] was inhibited (i.e. took longer) for some individuals and/or in some locations, to what do you attribute it?

12. If there was initial resistance or uncertainty toward [ASAPS], what did you do to help reduce it?

13. Did [ASAPS] itself change in any way during the transition? Please explain.

14. In what ways might culture differences have influenced the transition?

15. What would you do differently if you were to take on a similar role in some future project? What would you try to do again?

16. If [ASAPS] is part of your current work in some way, how satisfied are you with the system as a whole?

17. Is there anything else you'd like to share about what you experiences during the [ASAPS] transition process?

Appendix C

User Online Questionnaire Questions

Unless otherwise stated, the following questions are concerned only with the [ASAPS] transitioning process (i.e. from the moment you became aware of [ASAPS] to the point when you began using the system on a regular basis). As much as memory will allow, please answer each question with this timeframe in mind. When applicable, please try to differentiate your initial perception of [ASAPS] from your later perceptions, identifying shifting perceptions is an important aspect of this research.

Your participation in this study is greatly appreciated. Thank you for taking the time to answer the questions that follow. Given the number of years that have passed since you first were introduced to [ASAPS], some of these questions may be difficult to answer. Please, provide whatever information you are able to recall, and know that additional examples or elaborations are especially helpful in re-constructing a past event. Again, thank you!

1. Name (will be seen only by the researcher):

2. The year you were born:

3. Your nationality:

4. Your work location during the [ASAPS] transition:

5. Your job titles(s) during the [ASAPS] transition and a brief description of the work you did:

6. The number of years you had been with [GMDC] when [ASAPS] was first introduced in your location:

7. As best you can recall, give the month and year you first became aware of [ASAPS] and the month and year you made the switch to using [ASAPS] on a regular basis:

8. How was [ASAPS] primarily communicated to you when your first became aware of it?

9. Which individual(s) first brought [ASAPS] to your attention? (All names will be changed by the researcher)?

10. What were your initial thoughts about [ASAPS] when it was first presented to you?

11. Did you communicate your initial thoughts on [ASAPS] to those who were promoting its use in your location?

12. If you did communicate your initial thoughts with individual(s) promoting [ASAPS], how satisfied were you with the outcome?

13. If you did not communicate your initial thoughts, what kept you from doing so?

14. Thinking about your initial, informal conversations with colleagues at your work location, did their perceptions of [ASAPS] differ noticeably from your perception?

15. How much individual control do you believe you had in deciding whether or not you would use [ASAPS]?

16. In what ways was [ASAPS] communicated to you throughout the ENTIRE transition process (i.e. from the time you became aware of [ASAPS] to the point you began using it on a regular basis)?

    _____ Telephone calls

_____ Online/virtual meetings (i.e. netmeeting)

_____ Face-to-face meetings

_____ Email correspondence

_____ Other _____

17. Which communication methods were most helpful in facilitating the overall transition to [ASAPS]? If you like, please explain why.

18. Did your thinking about [ASAPS] change from the time it was first introduced to the time you began using it on a regular basis?

19. Did you ever become fully supportive of [ASAPS] during the transition process?

20. What most compelled you to begin using [ASAPS]?

21. From your perspective, which individual(s) were most involved in promoting the transition to [ASAPS] in your location? (All names will be changed)

22. Which individual(s) played the greatest role in facilitating your personal transition to [ASAPS]? (All names will be changed)

23. What do you remember most about the influence of the individual(s) listed above on your eventual acceptance and use of [ASAPS]?

24. From your perspective, were there any organizational factors that facilitated or hindered the transition to [ASAPS]?

25. Did management play a role in the transition process?

26. What role did you play in the [ASAPS] transition (i.e. how might you have influenced the process)?

27. Were you ever aware of cultural differenced among those involved in the transition to [ASAPS]?

28. Briefly explain how [ASAPS] impacted and/or changed the work that you did.

29. What do you remember most about the process of transitioning to [ASAPS]?

30. If [ASAPS] is part of your current work in some way, how satisfied are you with the system as a whole?

31. Feel free to share any additional comments or thoughts you might have about what you experienced during the transition to [ASAPS].

Appendix D

CONSENT INFORMATION SHEET

Introduction

You are invited to participate in a research case study of the transition to the [ASAPS] in [Gelderland, Limberg, and Minnesota]. You were selected as a possible research participant because you were actively engaged in the transition to ASAPS in one or all of these locations. Given your hands-on involvement during the introduction and subsequent adoption of ASAPS, you are in a unique position to tell the story of the ASAPS transition. Your insights and perspective on the experience will help to increase our understanding of how new technologies best transition into the work lives of those who use them. This study is being conducted by Grace Leinbach Coggio, PhD candidate in the University of Minnesota Writing Studies Department. Please read this form and ask any questions you may have before agreeing to be in the study.

Background Information

The purpose of this study is to explore how culture, context, and communication influence the transition to a new technology – ASAPS. Specifically, Coggio has the following research questions in mind:

1. How did culture, context, and rhetorical processes influence the perception and eventual acceptance of ASAPS?

2. In what ways did the technical communicator function as a change agent in the transition process?

Procedure

If you agree to be in this study, you will be asked to complete a 30-minute online questionnaire or a 45-minute interview. The information collected will be categorized and analyzed in order to tell the story of the ASAPS transition. The answers you provide will be viewed only by the researcher (Coggio) and will not be directly linked to you in subsequent analysis and discussions.

Risks and Benefits of being in the Study

The study does not have any risks. The study does not have any monetary benefits. The study will benefit the discipline of technical communication in terms of gaining insight into how best to transition to new technologies, as well as better understand the role of technical communicators in these processes.

Confidentiality

The records of this study will be kept private. Pseudonyms will be used for each participant in the study and Medtronic will be identified simply as a global medical device company. Information that might identify a subject will **not** be included in any sort of report or publication of the study. Research records will be stored securely and only the researcher (Coggio) will have access to them. Tape recordings of the interviews might be made, but only the researcher will have access. They will be erased after a period of five years.

Voluntary Nature of the Study

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or with Medtronic. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions

The researcher conducting this study is Grace Leinbach Coggio. You may ask any questions you have now via email: coggi007@umn.edu or by phone. You may also contact the Medtronic liaison to the study,[Steve Miller]. If you have any questions at any time during the course of the study, **you are encouraged** to contact Grace or Steve.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware Street Southeast, Minneapolis, MN 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

(I will ask the face-to-face interview participants to sign the following if IRB deems it necessary)

Statement of Consent:

I have read the above information. If I have asked questions, I have received answers. I consent to participate in the study.

Printed Name of Participant: _____

Signature: _____

Date: _____

Printed Name of Investigator: _____

Signature of Investigator: _____

Date: _____

Appendix E

ASAPS Development and Implementation Timeline

Date	Rel	Functionality	Languages
MAR 2001	1.0/1.1	Implant Manuals (authoring and translating)	8 (all Western European)
JUL 2001	1.2		+1 (Greek)
SEP 2002	2.0	Reference Manuals (authoring) Windows 2000	
MAR 2003	3.0	Reference Manuals (translating) Leads Manuals (authoring and translating)	
MAR 2004	4.1		+3 (Czech, Polish, Hungarian)
NOV 2004	5.0	Vitatron Implant & Leads Manuals (authoring and translating) Windows XP	
JUN 2005	6.0	SGML --> XML Vitatron Reference Manuals Vitatron Technical Ref Manuals (authoring and translating both)	+1 (Turkish)
FEB 2006	6.1	Authoring in topics	
JUL 2006	6.2	Making books from topics Clinician Manuals (authoring and translating)	+3 (Norwegian, Finnish, Slovak)
OCT 2007	6.3	ISO --> Unicode	+1 (Russian)

Appendix F

Coding #1 Categories

Categories that emerged from both User and Change Agent responses

	Socio-Cultural Context	**Agency**	**Technical Communicator Role/Function**
Change Agents	▪ Leadership/organizational issues ▪ Communication tools/processes ▪ Culture Issues ▪ View of ASAPS team ▪ View of innovation (ASAPS) ▪ View of early users ▪ View of later users	▪ Control during adoption-decision process ▪ Little/no control during adoption-decision process	▪ Positive perception of role/Function ▪ Negative perception of role/Function
Users	▪ Leadership/organizational issues ▪ Communication tools/processes ▪ Culture Issues ▪ View of ASAPS team ▪ View of innovation (ASAPS)	▪ Control during adoption-decision process ▪ Little/no control during adoption-decision process	▪ Positive perception of role/function ▪ Negative perception of role/function

Appendix G

Coding #1 Socio-Cultural Context Themes

Themes that emerged in *Leadership/Organizational Issues* from both User and Change Agent responses

Categories	Change Agent Themes	User Themes
Leadership/ Organizational Issues	Positive: ▪ Management gave full resource support – **M, G, L** ▪ Paul (manager) stepped up to "own processes" – **M** ▪ Dutch management addressed resistors – **G, L** ▪ Management decision to adopt clear in Gelderland and Limberg ▪ Gelderland had a strong opinion leader Negative: ▪ Lack of articulated management commitment – **M** ▪ Management allowed fear to perpetuate – **M** ▪ Management did not force adoption – **M** ▪ Most management did not learn the system ▪ Management did not recognize/reward the ASAPS team ▪ Had to "sell" ASAPS in 3 different locations/contexts ▪ Management allowed other systems to be developed – **M**	Positive: ▪ Management invested in it, paid for trips to US – **G,L** ▪ Mary's support was constant – **M(EU)** Negative: ▪ Management didn't actively support ASAPS or stop negative comments about it – **M(EU and LU)** ▪ ASAPS was a mandate from on high **– M(LU)** ▪ Had work/issues other than ASAPS to focus on – **M,G**

Appendix H

Coding #1 Socio-Cultural Context Themes

Themes that emerged in *Communication Tools/Processes* from both User and Change Agent responses

Categories	Change Agent Themes	User Themes
Communication Tools/Processes	Positive: ▪ Made concerted effort to build relationships in Gelderland ▪ Adapted communication as needed ▪ FtF most valuable form of communication ▪ Approach was more formal and planned in Europe Negative: ▪ Had difficulty communicating a novel idea/concept ▪ Had difficulty discerning what was a transitional versus "real" problem – **M** ▪ Resistors wouldn't articulate their concerns – **M**	Positive: ▪ Writers communicated support, built relationships – **M(EU)** ▪ Saw it working, saw firsthand immediate advantages – **M (EU),L** ▪ FtF was best – **M (EU and LU),G,L** Negative: ▪ Writers gossiping, secondhand comments, arguing – **M(EU and LU)** ▪ So complex it was hard to talk about it – **M(LU)** ▪ ASAPS team didn't listen – **M(LU)**

Appendix I

Coding #1 Socio-Cultural Context Themes

Themes that emerged in *View of ASAPS Team* from both User and Change Agent responses

Categories	Change Agent Themes	User Themes
View of ASAPS Team	▪ Belief in one another ▪ Pride ▪ Understood the writing profession ▪ Incorporated user needs ▪ Could've responded better to users ▪ Not translation experts ▪ Had a clear vision ▪ Disappointed that illuminating benefits didn't win people over	Positive: ▪ Enthusiastic and prepared – **G,L** ▪ Understood our challenges – **M(EU)** ▪ Knew writing, understood our needs – **A,L** ▪ Listened to us – **M(EU),G** ▪ Collaborated with us – **M(EU)** Negative: ▪ Not supportive, didn't meet our needs – **M(LU)** ▪ Dogmatic, intimidating, didn't listen – **M(LU)** ▪ Outsiders, didn't understand us **– M(LU)**

Appendix J

Coding #1 Socio-Cultural Context Themes

Themes that emerged in *View of Innovation* and *View of Early and Later Users* from Change Agent and User responses

Categories	Change Agent Themes	User Themes
View of Innovation (ASAPS)	▪ Cutting edge system ▪ Freed writers from menial work	Positive: ▪ Made re-use/translation easier- **M(EU and LU),L** ▪ System was needed – **M(EU)** ▪ Allowed more work to be accomplished – **M(EU),G** Negative: ▪ Changed the job – **M(EU and LU),G** ▪ Too abstract, difficult to articulate concerns – **M(LU)** ▪ New, not as good as other systems – **M(LU)** ▪ Not sure it would live up to expectations **– L**
View of Later Users	▪ Rebelled against it ▪ Passive aggressive behavior ▪ Some chose to leave rather than adopt ▪ Felt it was unnecessary ▪ Feared for their jobs ▪ Treated change agents as outsiders ▪ Wouldn't articulate their concerns	
View of Early Users	▪ Early adopters weren't asinvested in legacy tools as Later adopters ▪ Demonstrated it worked	

Appendix K

Coding #1 Socio-Cultural Context Themes

Themes that emerged in Culture Issues from both User and Change Agent responses

Categories	Change Agent Themes	User Themes
Culture Issues	▪ "Minnesota Nice" culture seen as passive aggressive, foreign – **M** ▪ Adoption easier in Gelderland: ASAPS already proven, smaller dept than US, didn't fear for jobs, came on board all at once, built relationships ▪ Gelderland gave us a second chance ▪ Felt more affinity with Netherlands than US colleagues ▪ Decisions took time in Gelderland, consensus driven ▪ Gelderland felt independent from Medtronic ▪ Limberg – philosophical differences about xml hindered adoption ▪ Limberg – multiple cultures represented ▪ Limberg - felt less control over implementation	▪ Professional culture differences greater than national culture differences – **M(EU and LU),L** ▪ Americans more articulate - **G** ▪ Differences are small, did not affect transition - **L** ▪ Dutch are direct, we took our time - **G**

Appendix L

Coding #1 Agency Themes

Themes that emerged in *Agency* from both User and Change Agent responses

Categories	Change Agent Themes	User Themes
Control During Adoption Decision Process	▪ Had a clear vision for ASAPS ▪ Understood the writing profession ▪ Control in how system was adapted ▪ Controlled most of the training processes ▪ Control during adoption was primarily through attraction	▪ Communicated support – **M(EU)** ▪ Actively contributed to transition – **G,L** ▪ Helped design, developed topics – **M(EU and LU)** ▪ Valerie felt she had control - **G** ▪ Curious about system – **L** ▪ Influenced which projects moved to ASAPS – **M(EU)**
Little/No Control During Adoption Decision Process	▪ No control over who used it ▪ Couldn't get people to own processes ▪ Competing against other tools that were allowed to develop – **M**	▪ Eventually all writers would have to use it – **M(EU and LU),G** ▪ Would lose control of what final product looked like – **M(LU)** ▪ No choice in adopting because projects were converted to ASAPS **– M(LU)**

Appendix M

Categorizing Coding #1 Technical Communicator Role/Function Themes

Themes that emerged in *technical communicator role/function* from both User and Change Agent responses

Categories	Themes for Change Agent Perception of Role	Themes for User Perception of Change Agent Role
Positive Perception of Role/Function	▪ Articulated a clear vision for ASAPS – **Steve, Lisa, Karen** ▪ Understood the needs of writers – **Steve, Lisa, Karen** ▪ Improved the system to meet writer's needs – **Steve, Lisa** ▪ Prepared users to use the system - **Karen**	▪ Communicated the vision for ASAPS - **G** ▪ Improved the system as needed- **M(EU),G,L** ▪ Educated/trained users in how to use the system – **G,L** ▪ Collaborated with users on system development – **M(EU),G,L** ▪ Understood user challenges, listened and responded to user needs – **M(EU),G, L**
Negative Perception of Role/Function	▪ Functioned as salesperson to generate interest in system - **Steve** ▪ No real authority over implementation – **Steve, Lisa** ▪ Couldn't get people to own processes – **Steve, Lisa**	▪ Dogmatic, didn't listen – **M(LU)** ▪ IT people, they didn't understand user needs – **M(LU)**

Appendix N

Coding #2 Categories and Themes in Minnesota

	Change Agents	Early Users	Later Users
Subject-Object	▪ Did not question the value or purpose of ASAPS.	▪ Believed in the innovation, it made sense ▪ Trusted the team's vision and expertise	▪ Questioned the value/propriety of the innovation, was it the right one? ▪ Found ASAPS too abstract
Subject-Community	▪ Perceived resistant users as rebellious and passive-aggressive for unfounded reasons. ▪ Tried to work with users to better adapt ASAPS to their needs.	▪ Felt included in the development of ASAPS and actively participated in the adoption decision process.	▪ Had very sound reasons to resist adoption. ▪ Found it difficult to participate in the process, felt ignored
Object-Community	▪ Saw ASAPS as highly beneficial to both the company and the users. ▪ Didn't believe management ever fully committed to ASAPS.	▪ Saw management support of ASAPS as unwavering. ▪ Believed ASAPS was a management mandate.	▪ Felt ASAPS changed the role of author ▪ Believed ASAPS was a management mandate.

Appendix O

Coding #2 Categories and Themes in Gelderland and Limberg

	Change Agents	**Early Users**
Subject-Object	▪ Had even greater confidence in ASAPS since it was a proven entity by the time it was introduced in Gelderland.	▪ Up front in their concerns about the usefulness and potential impact of ASAPS ▪ Accepted the business reason for it
Subject-Community	▪ Took greater care with Gelderland, viewed it as a second chance. ▪ Identified more with Dutch culture, appreciated the direct style. ▪ Relied on the translation expertise of people in Limberg.	▪ Felt included in the development of ASAPS and actively participated in the adoption-decision process. ▪ Were sensitive about culture difference, felt it had minimal influence on adoption-decision. ▪ One person in Arnhem believed she could prevent adoption if she felt it was warranted.
Object-Community	▪ Perceived on-site management support as decisive within both Gelderland and Limberg organizations. ▪ Saw early resistors handled by management before implementation, were a non-issue	▪ Perceived management support of ASAPS as constant, including paid trips to US to learn system. ▪ Most believed the adoption of ASAPS was a management decision that ultimately made sense.