

FUNDING THE TECHNOLOGY OF A RESEARCH UNIVERSITY

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ABSTRACT

Using the central information technology unit (CITU) on the North Dakota State University (NDSU) campus, this project triangulated two independent studies in an effort to converge data findings. The studies were conducted in an effort to determine whether CITU's budget constraints were known to its stakeholders and how the extended use of the theory of Communication Privacy Management (CPM) into this organizational communication setting might be possible. The studies, which were both conducted by a CITU employee (participant/observer) included: 1) an online email survey involving 244 non-student employee participants and 2) interviews with 21 non-student employees.

In Study #1, the participant/observer and two independent coders found, with the exception of CITU's leadership, that NDSU's non-student employees did not appear to consider CITU's budget constraints in their IT needs/requests of CITU. From these results, the participant/observer and two independent coders identified a communication opportunity for CITU to create a message linking CITU's inability to meet the campus' IT needs/requests directly to its budget constraints.

In Study #2, the participant/observer and two independent coders again found, with the exception of CITU's leadership, that NDSU's non-student employees did not appear to consider CITU's budget constraints in their IT needs/requests of CITU. Additionally, the participant/observer and two independent coders found the presence of all six CPM propositions and four facets of communication identified in both the CPM and organizational communication literature.

Even in an open-records state, such as North Dakota, CPM may be useful in describing the communication challenges surrounding both private and traditionally private information within newly formed organizations like CITU or within existing organizations that function more as a set of unrelated individuals. Central IT units or other organizations that are experiencing relationship dissatisfaction with their stakeholders due to budget constraints must work to invite their stakeholders to be co-owners in their budget difficulties, so that they understand why their IT need/requests are not being met. In order to accomplish this task, CITU's message must be simple and consistent and must be accompanied by a firm set of negotiated rules. When messages are consistent and understood, satisfied co-ownership exists.

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CHAPTER ONE. INTRODUCTION

“Reactive-technology-driven environments are those in which the technology drives a change in such a way that the impact on people or the organization as a whole is not considered” (Herndon, 1997, p. 125)

“Reactive-technology-driven environments” of the late 1990s and early 2000s were the subject of Herndon’s 1997 statement, outlined above. At the time, indications that Herndon’s claim was already supported existed, as documented in The Standish Group’s 1995 review of more than 8,300 information technology-based projects, which reported project implementation failure rates in excess of 31%. Furthermore, in that same report, The Standish Group predicted: “in 1995 American companies and government agencies will spend \$81 billion for cancelled software projects” (1995, p. 2). In addition, the research group also reported that most completed IT projects fall short of user expectations: “projects completed by the largest American companies have only approximately 42% of the originally-proposed features and functions” (The Standish Group, 1995, p. 2).

During that same time frame, and perhaps exacerbating the problem, was an increased effort by many organizations, including those in higher education, to “integrate major business process(es)” (Boudreau & Robey, 2005, p. 5). Large IT systems developed to integrate business processes, often called enterprise resource planning (ERP) systems, are designed to handle organizational-wide financial, human resource, and work order processing. In higher education, ERP systems also handle most student/customer processes, such as registration, academic records, housing assignments and billing, financial aid, and

tuition/fee payments. Often, as in this document, the terms “customer,” “client,” “end-user,” “user,” and “stakeholder” are used interchangeably within the IT literature to describe an individual who, or a group that, relies on the IT products or services developed, purchased, or maintained by a central IT unit.

Since 1995, even though subsequent research has given testimony to the necessity to involve stakeholders earlier in the IT configuration process so their input, regarding their ultimate use of technology can be more fully understood and therefore be better incorporated into a product’s design (Akkermans & van Helden, 2002; Finney, 2011; Finney & Corbett, 2007; Kamhawi & Gunasekaran, 2009). In 2007, Finney and Corbett found that post-implementation stakeholder involvement is also of vital importance to the long-term success of ERP and other IT systems. Stakeholder involvement is also considered important in both the pre- and post-phases of higher education IT system implementations (Allen, Kern, & Havenhand, 2002; Bologna, Muntean, Sabau, & Scorta, 2009; Sullivan, 2009; Sullivan & Bozeman, 2010).

Yet, in their 2009 report, The Standish Group reported that IT project failure rates were as high as 24% and that as many as 44% of the completed projects did not meet stakeholder expectations when delivered. Failure assessments in The Standish Group’s report were based on both missed delivery times and budget projections, while missing features or functions contributed to unmet stakeholder expectations (Dominguez, 2009). What if, given the current economic environment, particularly within higher education, another factor, not as readily discussed throughout the organization, is also contributing to

user perceptions of IT failure? Specifically, could user perceptions of IT project failures be partially rooted in higher education budget constraints? To paraphrase Herndon’s 1997 words, quoted on page one, are “reactive-[budget]-driven environments [driving technological changes] in such a way that the impact on employees or the organization as a whole is not considered” (p. 125)?

Project Acronyms and Terminology

Throughout this project, several acronyms, listed in Table 1, were used to abbreviate frequently repeated terminology. Additionally, as discussed in the introduction, several terms will be used interchangeably to describe those individuals who or groups that rely on the information technology products and services of the central IT unit.

Table 1. Project Acronyms and Terminology

Acronym/Term	Full Term	Definition
CITU	<u>C</u> entral <u>I</u> nformation <u>T</u> echnology <u>U</u> nit	NDSU’s centralized IT division; this generic name is used in an effort to avoid confusion in referencing each of the division’s four departments
Client(s)	CITU client, customer, end-user, stakeholder, user, etc.	Individual or group reliant on the IT products and services of CITU
CPM	Theory of <u>C</u> ommunication <u>P</u> rivacy <u>M</u> anagement	Communication theory used in this project
Customer(s)	CITU customer, end-user, stakeholder, user, client, etc.	Individual or group reliant on the IT products and services of CITU

(continued)

Table 1. Project Acronyms and Terminology (continued)

Acronym/Term	Full Term	Definition
EDUCAUSE	EDUCAUSE	“a nonprofit association whose mission is to advance higher education by promoting the intelligent use of IT” (EDUCAUSE, 2011)
End-user(s)	CITU end-user, stakeholder, user, client, customer, etc.	Individual or group reliant on the IT products and services of CITU
ERP System	<u>Enterprise Resource Planning</u> system	Large IT system that integrates an organization’s business processes
IRB	<u>Institutional Review Board</u>	Board governing the rights of individuals participating in NDSU research studies
IT	<u>Information Technology</u>	Technology- driven products, services, or systems used to manage stakeholder information
NDSU	<u>North Dakota State University</u>	Project site
PAR	<u>Participatory Action Research</u>	Repetitive action research cycles, used to address an issue in a participatory manner, in a pattern of 1) planning, 2) action, and 3) observation (Wadsworth, 1998; Walter, 2009)
Stakeholder(s)	CITU stakeholder, user, client, customer, end-user, etc.	Individual or group reliant on the IT products and services of CITU
Participant/observer	The project researcher is the participant/observer	Project researcher, who works within the researched community to assist in facilitating community-driven change (Walter, 2009)

(continued)

Table 1. Project Acronyms and Terminology (continued)

Acronym/Term	Full Term	Definition
Study #1	First study conducted at NDSU	Study consisting of a campus-wide survey of NDSU non-student employees conducted from 2008-2011 under NDSU IRB #HS08236 (Appendix A)
Study #2	Second study conducted at NDSU	Study consisting of interviews of NDSU non-student employees beginning in 2011 under NDSU IRB #HS12053 (Appendix F)
User(s)	CITU user, client, customer, end-user, stakeholder, etc.	Individual or group reliant on the IT products and services of CITU

Statement of the Issue/Problem

Since the retirement of mainframe computers, organizations have struggled with the dichotomy between centralized and decentralized IT units (Fiedler, Grover, & Teng, 1996). Contributing factors are both the location of the centralized IT unit within an organization's hierarchy and the decentralized IT unit's ability to better serve small groups of users. In addition, the contrast between the centralized and the decentralized IT unit has historically been intensified due to the inability of most centralized IT units to complete large projects, such as ERP implementations, or to meet user expectations for delivery times and product content (The Standish Group, 1995, 2009). For public institutions of higher education, these factors are coupled with declines in funding, decreasing IT product lifecycles (useful life of the technology), and increasingly IT-savvy students, faculty, and staff.

Public institutions of higher education are typically funded from three primary sources: state general fund, tuition, and endowment, each of which has experienced limited growth since 2007 (National Conference of State Legislators, 2010). At the same time, exponential changes in technology advancements continue to place heavy IT demands on institutions of higher education (Grajek, the 2011-2012 EDUCAUSE IT Issues Panel, & Pirani, 2012; Ingerman, Yang, & the 2011 EDUCAUSE Current Issues Committee, 2011; Ingerman, Yang, & the 2010 EDUCAUSE Current Issues Committee, 2010). Ironically, as new technology is introduced, the useful life of that technology continues to decrease, resulting in increasingly frequent replacement timelines for IT equipment and software, which must be charged against these limited budgets. Like their private-sector counterparts, when faced with funding shortfalls and declining IT product lifecycles, IT leaders in higher education strive to stretch their limited budget dollars.

Strategically employed technology is necessary to sustain institutions of higher education (Golden, 2009; Padrón, 2009). Impeding this necessary goal, today's institutions face the dual challenges of declining budgets and shorter IT product lifecycles, which leave them increasingly hard pressed to put their limited resources into the right IT categories. In her general session address at the 2010 EDUCAUSE annual conference, Jolene Koester, President of California State University Northridge, spoke about the job of the IT vice president or others who lead their institution's central IT unit. Dr. Koester stated the presidents of institutions of higher education must strive to:

Understand the critical importance of keeping the basic information technology infrastructure working ... reliably working well. When basic and key systems don't work, the Information Technology Vice President loses credibility, and his or her ability to be an all-university vice president is diminished (2010).

Furthermore, as previously identified, complex, system-wide IT-based innovations, like ERP systems, continue to require sustained level of subject matter expert and IT support following implementation (Gallagher and Gallagher, 2009). As a result, centralized IT units continue to disappoint campus users. Another factor complicating these funding and technology issues for institutions of higher education is that students are entering the classroom in technologically a-stereotypical ways (S. D. Smith & Caruso, 2010), often knowing more about certain technologies than campus IT personnel. In some cases, student IT expertise results in role reversal with the student in the role of IT expert and the campus personnel in the role of IT novice.

Provisioning Centralized IT Services in a Higher Education Setting

IT provisioning is reminiscent of the numerous iceberg analogy illustrations of Freud's, often disputed, "above-the-surface conscious" and the "below-the surface preconscious and unconscious" structure of the human mind (Alzougool, Chang, & Gray, 2008; Blasko, 1999; Mackay, 1992). Adapted by the New Zealand Education Ministry (2010), the iceberg analogy has also been used to describe the common underlying proficiency model of bilingual acquisition (Figure 1). In the bilingual acquisition analogy (similar to an IT support analogy), the features of language (client demands) are reflected

above-the-surface; while the common underlying proficiencies, or the central operating systems (IT enabling services), are in shown below-the-surface (New Zealand Education Ministry, 2010).

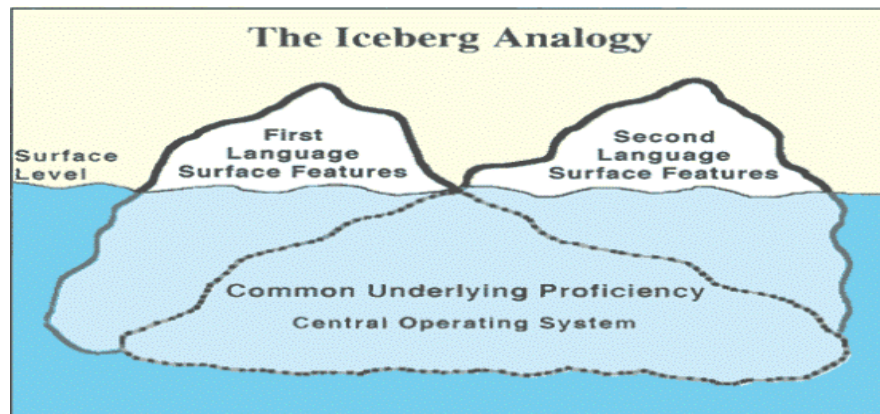


Figure 1. Iceberg analogy for bilingualism (New Zealand Ministry of Education, 2010)

In applying the iceberg analogy to the “user-visible” client demands and the “user-invisible” IT provisioning services of a central IT unit, the visible services are typically services that the client demands or services with which the client readily interacts. Email, desktop support, calendaring, learning management systems, and training are all examples of “user-visible” products and services. Middleware, operating systems, building and underground infrastructure, and common communication network infrastructure are examples of products and services which, although vital to the overall IT provisioning structure, are often not visible to most IT users. Figure 2, also an adapted iceberg analogy by The 451 Group (2011), shows the full range of product and service responsibilities for a central IT unit, or “IT Service Provider,” most of which are “invisible” to the end-user.

Unfortunately, when budgets are limited, the resources of a central IT unit (time and funding) must continue to be spent on “user-invisible” IT products and services, while the “user-visible” services suffer.

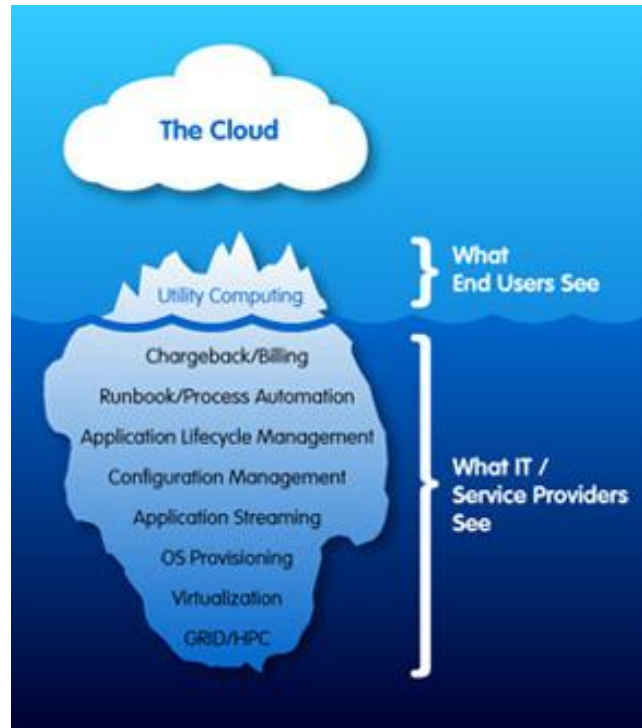


Figure 2. Infrastructure computing for the enterprise; ICE (The 451 Group, 2011)

Rationale for Addressing the Issue/Problem

Central IT units within today’s institutions of higher education face budget and technology challenges that may be manifesting themselves as communication challenges and contributing to unfavorable user perceptions of the central IT unit. In spite of a 2010 EDUCAUSE call to bring others into the previously private IT product and service

selection process (Ingerman et al., 2010), central IT units may continue to avoid the communication challenges inherent in their budget and technology decisions. The central IT unit must seek to become both “an enabler and partner in helping colleges and universities adapt to and even capitalize on changing [IT] realities and needs” (Grajek et al., 2012, p. 53). For central IT units, the continued strategy to maintain impermeable communication boundaries (Petronio, 2002) around budget and technology challenges may be doing campuses a disservice, especially given the “perpetual agitation between ... [the] costs of high expectations and the ability of the campus to effectively and consistently fund technology solutions to meet ... [those] expectations” (Ingerman et al., 2011, p. 28).

Significance of the Issue/Problem

In 1959, when International Business Machines (IBM) introduced its second line of mainframe multiprocessing computers for business and small scientific or engineering applications, the IBM-supported life of those machines was 13 years (International Business Machines, 2011). With mainframe technology, the central IT unit was legitimately able to dictate which users could access the information, what information each user could access, where the user was located when the information was accessed, when the user could access the information, and how the user received the accessed information. This centralized arrangement was difficult for both the central IT unit and the user. Although the central IT unit had full control of the information, it could not meet user demands for immediate information.

With the introduction of the personal computer (PC) in the early 1980s, information control began to rapidly shift from the central IT unit to the user. The PC transferred the “who-,” “what-,” “where-,” “when-,” and “how-” control of IT information to the user. As information access was transferred away from the central IT unit, user demands of the central IT unit for user-friendly customizable information, delivered anywhere, anytime, on any device (e.g., PC or smart mobile device [e.g., laptops, iPads™, or phones]), began to dramatically increase. Campus departments with limited departmental IT budgets seek the central IT unit’s help to either upgrade their technology or to extend the useful life of their technology beyond vendor recommendations. However, under this decentralized arrangement, some campus departments (those with funding) are better equipped to serve the IT needs of their units by hiring departmental IT professionals.

In this new distributed environment, the central IT unit is hard-pressed to enforce IT standards. Also impacting the central IT unit’s ability to develop standards is the rapidly decreasing useful life of the PC and its related software products, with vendor-recommended useful lives of just 3-5 (Mann, 2011) and 5-7 (Microsoft, 2011) years, respectively. Coupled with these contrasting demands, the campus central IT unit must also be positioned to serve each year’s new student class that arrives on campus each fall with the latest IT devices.

This project examined whether, in its increasingly decentralized environment, the perceived inability of one higher education central IT unit (CITU), to meet user demands might be rooted in a general lack of communication surrounding the budget and technology

challenges currently being experienced by CITU. More specifically, this project was initiated to help determine how CITU's decentralized IT environment, combined with the shorter lifecycles of the IT products and systems CITU must support and its increased budget constraints, might be contributing to unfavorable user perceptions of CITU. As already suggested, the results of this project might give CITU and other central IT units actionable insight about how user perceptions can be influenced by communication (Grajek et al., 2012; Ingerman et al., 2011; Ingerman et al., 2010).

Factors that Exacerbate the Issue/Problem

IT Budget Challenges for Higher Education

The 2007 recession continues to negatively impact both general-fund allocations and endowment contributions and earnings, forcing institutions to increase tuition rates to cover lost revenues (National Conference of State Legislators, 2010). In addition, some state legislatures have limited the tuition increase a campus can charge (Eccher, 2012a), further complicating the funding picture for these institutions. As a result, higher-education IT budgets nationwide are expected to “remain flat (or even decrease) for the foreseeable future as higher education institutions continue to grapple with the effects and after-effects of the downturn in the economy” (Ingerman et al., 2010, p. 49).

Higher-education budgets are so flat that, in its annual survey of member institutions, EDUCAUSE, one of the nation's primary experts on IT within higher education, identified “funding” as the top IT issue in 2011 and as one of the top ten IT issues facing higher education each year since 2000 (Ingerman et al., 2011; Ingerman et al.,

2010). Indeed, many of the IT issues identified in the 2011 annual survey (Ingerman et al., 2011) stemmed from a root issue of funding. Following funding, the IT issues identified in the 2011 survey are: 2) administrative/ERP/information systems; 3) teaching and learning with technology; 4) security; 5) mobile technologies; 6) agility/adaptability/responsiveness; 7) governance, portfolio/project management; 8) infrastructure/cyber-infrastructure; learning management systems; 9) disaster recovery/business continuity; and 10) strategic planning (Ingerman et al., 2011). Furthermore, although the 2012 EDUCAUSE report ranks “funding” seventh in the top 10 IT issues facing higher education, the survey format was purposefully changed in the 2012 iteration; as a result, the only 2011 items which are specifically listed again in 2012 are “funding” and “governance” (Grajek, et al., 2012).

Others have already tied inadequate or inconsistent IT funding for higher education to a lack of technological advancements (Latchem, Jung, Aoki, & Ozkul, 2008) and the inability to properly monitor technology (Center on Education Policy, 2007) or to update the IT professional’s skills (Grajek, et al., 2012). Higher-education technology initiatives in administrative/ERP/information systems, mobile technology (Ingerman et al., 2011), career development services (Venable, 2010), disaster recovery/business continuity, identity/access management, infrastructure/cyber-infrastructure, learning management systems, library services (Budd, 2007; Stanley & Malenfant, 2010), research (Peekhaus, 2010), and teaching or learning with technology (Chitiyo & Harmon, 2009; Eneku & Ojogwu, 2006; C. J. Smith, 2010) are all vulnerable to funding limitations.

Technology Challenges for Higher Education

In addition to diminishing budgets, central IT units are challenged with IT product and service replacement lifecycles that continue to decline. IT products, such as personal computers, which once had a manufacturer's recommended useful life of 5-7 years, now have a recommended useful life of just 3-5 years (Mann, 2011). At the same time, user-adoption rates from first knowledge of an innovative IT product or service to full-scale adoption (Rogers, 1995) are also becoming shorter, particularly for the younger generations (e.g., students and new faculty and staff members). Shortened IT adoption periods result in more frequent requests of the central IT unit to attach an increasingly wide array of technologies (e.g., smart and other multi-purpose mobile devices) to campus IT networks and to adopt software products and mobile applications without a traditional wait period to determine whether the technology is mature enough for the environment. Furthermore, the increasing trend by students, faculty, and staff to bring-their-own-device to campus (Grajek, et al., 2012) requires that central IT unit staff must be familiar with these varied technologies as soon as they are introduced.

Already stretched beyond their funding limits, central IT units in higher education are scrambling to find ways to lengthen the useful life of the centralized IT products and systems they purchase or build. The most common tactic is to delay product or system replacement. The delay tactic usually involves waiting to make IT product or system purchases, or pushing back a system rewrite beyond the recommended useful life of the system. Indeed, guidelines from state budgeting agencies, such as the Office of the

Comptroller, Commonwealth of Virginia (2011), readily acknowledge replacement delays due to budget: “even though some information technology equipment may have a short useful life due to obsolescence, the agency may continue to use it longer because it continues to do the job and the agency lacks appropriations to replace it.” Similar delays in software upgrades may not prove as prudent due to the inherent risk involved in running commercially unsupported software. For example, as depicted on its product support lifecycle web site, Microsoft (2013) will no longer provide user support for its Window XP products after August 2014.

Another example of a common delay approach that institutions, like CITU’s, use for the underground IT infrastructure is to piecemeal the replacement of underground infrastructure, beginning with those areas of campus (e.g., research) that most benefit from the faster speeds, such as campus research units. Most buildings have a life expectancy of 50 years (Anixter, Inc., 2009). Underground infrastructure, although touted to have a useful life of more than 10 years (Anixter, Inc., 2009), often requires an earlier replacement cycle to attain faster speeds. Delay tactics are also common in the replacement of building network equipment. Traditional building network equipment (routers, switches, and hubs) and software have a useful life of just one to five years (Anixter, Inc., 2009).

Compounding the difficulty in allocating IT budgets to underground infrastructure and building networking equipment is that both are examples of technology that is invisible to the IT client. As is the case in all organizations, central IT units within higher education have to make difficult budget choices between “user-visible” IT products and services

(e.g., increased file storage, additional wireless access points, improvements to instrumented classrooms, or learning management systems) and “user-invisible” IT products and services (e.g., upgrades to the underground infrastructure, building wiring, network equipment, and replacement of system servers and backup tapes). The challenges of limited funding, decreased useful life, and shortened adoption rates create tension for both the institution and central IT unit (Grajek, et al., 2012; Ingerman et al., 2011; Ingerman et al., 2010).

IT Communication Challenges for Higher Education: Budget + Technology

IT decisions have foundational importance to higher-education programs and services (Golden, 2009; Grajek, et al., 2012; Ingerman et al., 2011; Ingerman et al., 2010; Koester, 2010; Padrón, 2009). As outlined in the preceding sections, in allocating their limited IT budgets, central IT units must often choose between “user-visible” IT products and services (e.g., Help Desk staffing, improvements to learning management systems, instrumented classroom technology, or research database management) and “user-invisible” IT products and services (e.g., underground cabling, building wires, network authentication, user storage, or storage backup). For the central IT unit, these choices often manifest themselves in user expectations for “user-visible” products and services versus the need to keep the “user-invisible” campus IT infrastructure operational.

In addition, pressures from campus stakeholders to adopt innovative IT products and services as soon as they are released have central IT units scrambling (Grajek, et al., 2012). In 2008, Gartner, Inc. strategist’s Fenn and Raskino cautioned leaders with limited

IT budgets against making IT decisions when products and services were in the “Technology Trigger,” “Peak of Inflated Expectations,” or “Trough of Disillusionment” phases of the Hype Cycle (Fenn & Raskino, 2008; Gartner, Inc., 2011). Figure 3 illustrates the organizational research typical during the five phases of Gartner’s Hype Cycle (O’Leary, 2008). For public higher-education campuses, like NDSU, which have limited IT budgets, investing in IT products and services early in the “Slope of Enlightenment” phase is critical so that the campus benefits from the “Plateau of Productivity” phase (Fenn, & Raskino, 2008; Gartner, Inc., 2011; O’Leary, 2008).

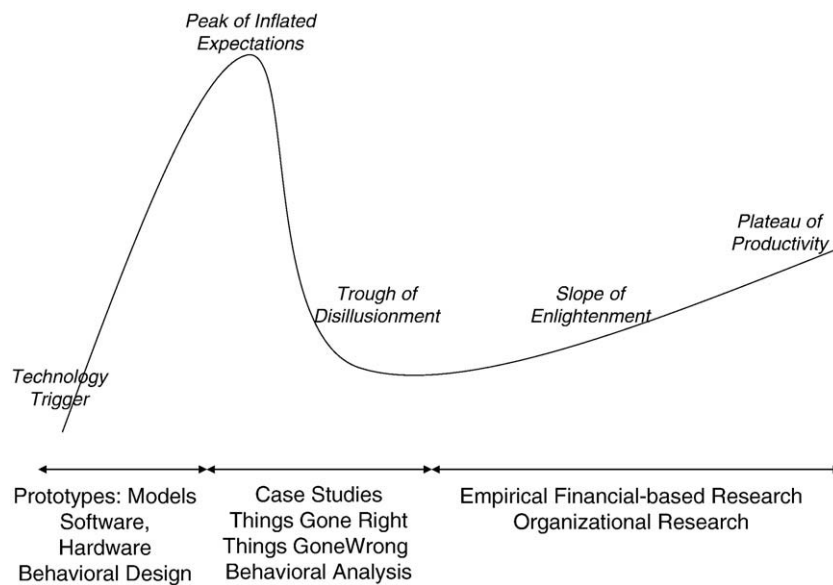


Figure 3. Research using Gartner’s Hype Cycle stages (O’Leary, 2008, p. 247)

Project Goals

Collected through a campus-wide survey and interviews of NDSU non-student employees intended to respectively gather campus' IT expectations and perspectives, the participant/observer, worked with two sets of independent coders to categorize survey and interview responses. An effort was made to determine whether any links could be established between the budget declines that have limited CITU's ability to serve NDSU over the past 10 years and NDSU non-student employee requests for IT services or their perceptions of CITU. Thus, one project goal was to determine whether there was any indication that limited budgets, shorter lifecycles, and rapid innovation adoptions were affecting user requests for IT products and services or were contributing to user perceptions of CITU. As a second project goal, the data were also combined in an effort to match NDSU non-student employee IT expectations with their perceptions of CITU. Additionally, the categories identified in this project were compared to both the IT user expectation categories that emerged in a 2009 university-wide survey conducted at University of Nebraska – Lincoln (UNL), in which UNL employees were asked about the services they expected to receive from the central IT unit at UNL (UNL, 2009) and the 2011 EDUCAUSE survey categories (Ingerman et al., 2011).

Delimitations

This project had two known delimitations. The first delimitation is the single campus focus of this project. The second delimitation stems from the dual role of the participant/observer, both as the project researcher and as the interim leader of one of

CITU's four departments. These delimitations, introduced here and described below, are further discussed in the "Addressing the Project Delimitations" section of Chapter Three. Due to the nature of the second delimitation, the participant/observer has taken extra care in introducing and describing these delimitations.

Single Campus Focus: NDSU as a Single Site Case Study

This project focused on one central IT unit, CITU, on one higher education campus, NDSU. Although single site studies can be problematic, Tellis (1997) believes, done correctly, a single site study will "satisfy the three tenets of the qualitative method: describing, understanding, and explaining" (Tellis, 1997, para. 14). Yin has argued that single site studies, properly executed, have merit (1994, 2004, 2009). To be effective, a single site case study must establish parameters that can be applied to later research (Tellis, 1997).

NDSU is a Midwestern, land-grant, doctoral, research university that serves 14,399 students (NDSU, 2011a) and employs 6,176 (NDSU, 2010a). Since 2000, student enrollments at NDSU have increased by nearly 44% (NDSU, 2011a), and most students, 95%, receive their instruction on campus (Bresciani, 2011). During a similar time frame (1999 through 2009), NDSU's external research award expenditures increased by 204% (NDSU, 2009). However, as in other states, legislatively-supported operating budget increases for NDSU have been limited. Since 1999, NDSU's state support has increased by just 8% overall (N. D. Legislative Council, 1999, 2011). In addition, in most of the biennial

funding cycles since 1999, NDSU's ability to increase tuition has also been legislatively limited.

As a land-grant institution established under the 1862 Morrill Act and the 1914 Smith-Lever Act, NDSU has a responsibility to its state to educate its citizens as well as to attend to and contribute to its economic and social welfare, particularly in the area of agriculture (Gleason, 2010). In recent years, the land-grant mission has become skewed for many institutions as the "economic forces changing agricultural technology, global markets, and rising income expectations have resulted in ever fewer, ever larger farms" (McDowell, 2003, p. 45). However, given the continued prominent role of agriculture in North Dakota, the land-grant mission of NDSU continues to be heavily supported (Bresciani, 2011).

As a doctoral institution, NDSU currently offers 44 doctoral and 60 master's programs to its 2,146 graduate and 342 professional students (N. D. University System, 2011a). Fifty percent of NDSU's graduate and professional students are female, and 50 percent are male (N. D. University System, 2011b). Nearly 31% of NDSU's graduate students are international students (NDSU, 2011b). Most of NDSU's graduate and professional students, 60%, are enrolled on a part-time basis (N. D. University System, 2011a).

NDSU also provides over 100 bachelor's degree programs to its 11,911 undergraduate students, 56.6% of whom are male and 43.4% of whom are female (N. D. University System, 2011b). Approximately 5% of NDSU's undergraduate students are

international students (NDSU, 2011b). Unlike their graduate-student counterparts, relatively few, 10.4%, of NDSU's undergraduate students are enrolled part time (N. D. University System, 2011a).

Nationally ranked at 108 as a research institution, NDSU is a member of the Carnegie Commission on Higher Education "Very High Research Activity" category (Bresciani, 2011). In the most recent National Science Foundation (NSF) tally, NDSU reported \$126 million in research expenditures (Bresciani, 2011). Not unexpectedly, given its land-grant mission, NDSU typically receives top ratings in agricultural sciences and has placed in several of the top-100 NSF research categories (NDSU, 2008b).

Currently, NDSU, like other campuses nationwide, is struggling within an economy that is not favorable for public/state-funded institutions of higher education (Ingerman et al., 2011; Ingerman et al., 2010); "for higher education, traditional revenue and costing models no longer scale" (Ingerman et al., 2011, p. 40) and "the IT funding issue ... [will require] ongoing conversation (Grajek, et al., 2012, p. 49). Like its sister institutions, NDSU is currently engaged in a "scramble for funding support" (McDowell, 2003, p. 43). For the most recent biennium reported, the 2007-2009 funding cycle, NDSU's operations required a student contribution of 62% with a state match of just 38% (N. D. University System, 2011c). In his September 2011, State of the University Address, President Dean Bresciani succinctly summed up NDSU's position: "we are a state investment without comparison," as supported by the following:

1. No aspect of our state, other than agriculture, more impacts the future of North Dakota than higher education, and no institution in the state does so better than NDSU. That fact was confirmed by Moody's Investment, and both the National Science Foundation and the Carnegie Commission on Higher Education (Bresciani, 2011).
2. Ironically and in spite of that, NDSU has been underfunded relative to other North Dakota colleges and universities; that is irrefutable, inexplicable, and bad business for our state and its residents. Current per-student funding at NDSU, if doubled, would still be less than several of our state's other higher education institutions (Bresciani, 2011).
3. NDSU provides a documented return on investment of almost \$7 on every \$1 of state support (Bresciani, 2011).

Yet, as they have during the past 14 years, North Dakota's Office of Management and Budget 2013-15 budget guidelines (2013) continue to call for flat operating budgets; thus, the NDSU campus may continue to experience decentralized IT support growth as campus stakeholders prioritize IT support within their individual departmental budgets.

NDSU's Central Information Technology Unit (CITU). NDSU's central information technology unit, the Information Technology Division, is comprised of four departments. Formed in 2008, the division is without an acronym that encompasses the entire division. Thus, in an effort to simplify the project storyline and to provide the reader with an easier connection to the case, unmarred by NDSU's identity, the

participant/observer chose to use the fictitious acronym CITU or Central Information Technology Unit, which stands for central information technology unit.

CITU departments assist NDSU students, faculty, and staff in the planning, implementation, and support of a wide range of centrally deployed services and resources. CITU's Help Desk serves as the contact site for most departments' services, which include application development and management, computer labs, desktop support, emergency support technologies, enterprise voice systems, instructional services, instrumented classrooms, Internet 2 development and outreach, learning management system support, maintenance of underground and building communications infrastructures, networks, research and non-research database development and management, server support, statistical analysis, storage, training, tribal-college outreach, and video. Finally, as one of the largest institutions in North Dakota, NDSU's CITU contracts with the university system to provide IT services and resources to NDSU, the university system, and many of the state's 10 other campuses.

In 2010, CITU had 77 full-time employees (NDSU, 2010b), 57 of whom were funded by NDSU in support of central IT functions; thus, the NDSU user to CITU employee ratio is just over 361:1 ((14,399 students + 6,176 employees = 20,575 potential NDSU users)/57 CITU employees). The remaining 20 employees were funded by the dollars CITU receives either from the university system or from individual NDSU departments for direct IT services and support. In addition, CITU receives funds from a student technology fee to augment its staff with over 50 part-time student employees.

CITU's campus responsibility is offset by the existence of many decentralized IT experts who serve the departments that employ them. Since 1999, as is the case for many NDSU departments, the state-funded portion of CITU's budget has been flat, and these decentralized employees have been hired by various departments to meet their immediate IT needs. Seeking to establish a good working relationship with these decentralized employees, CITU has formed several campus-wide IT liaison groups. Yet even with these relationships, CITU continues to struggle to meet campus-wide demands for central IT systems and services. CITU's efforts are complicated by the ever-evolving nature of IT, making it difficult for CITU to meet the needs of its three primary, vastly disparate, user groups: students, faculty, and staff.

NDSU student (undergraduate, professional, and graduate) IT users typically arrive at NDSU each year with the latest technology and expect that it will seamlessly function and integrate with NDSU's IT network (S. Sobiech, personal communication, October 22, 2012). Whenever their expectations are not met, those students turn to CITU for assistance. Students arrive at CITU (some with their parents in tow), expecting CITU staff to be familiar with their technology; such that, with very little time exertion on their part, the device(s) will soon faultlessly function on and integrate with NDSU's network (S. Sobiech, personal communication, October 22, 2012). In addition, students expect their connection to NDSU's network to be maintained, regardless of where they go on or off campus (S. Sobiech, personal communication, October 22, 2012).

NDSU faculty employees are, potentially, the most diverse group of IT users that CITU serves. Faculty IT diversity is related to the wide-range of technological experiences within this group. Some faculty members' technological skills rival the skills of CITU's most senior IT engineers. The IT demands of these "super users" for distributed databases, data mining, bio-informatics, and other advanced technology severely tax NDSU's IT infrastructure. Conversely, CITU also serves faculty members with limited IT experience who need IT training services, particularly in the NDSU Blackboard (learning management) system.

Within the past decade, NDSU staff employees have migrated from a legacy mainframe system operated by CITU for daily operations to a state-wide ERP system operated by the university system (N. D. Legislative Council, 2006). The ERP system is used to conduct all of NDSU's student administration, human resource, payroll, and financial business functions. Due to the statewide nature of the product, the ERP is not maintained by CITU and despite repeated requests from NDSU staff employees, CITU can provide only limited training and support options for this system. CITU does, however, support many other IT applications used by NDSU staff employees and provides desktop support service for roughly 2,500 of NDSU's faculty and staff computers.

Like their nationwide counterparts (Grajek et al., 2012), NDSU faculty and staff employees continue to look for ways to maximize their time and output. CITU's inability to fund development projects or to provide additional storage capacity has many employees looking toward the "Cloud" for technical solutions; see Figure 2. The "Cloud" is an offsite,

vendor-owned, fee for service, computer network that enables individuals and organizations to share software application and storage space at a relatively low cost. Unable to rapidly deploy a similarly priced alternative, CITU can only caution those departments making a “Cloud” decision to be certain that their vendor arrangements are secure and comply with state and federal data statutes, especially in the areas of student and employee records.

As technology lifecycles decline, IT infrastructure replacement funding must grow. Declining technology lifecycles drive the need for more frequent IT training. In addition, as technology evolves, IT products have become more portable, allowing NDSU’s students, faculty, and staff to become more mobile. Indeed, “CIOs should assume that the entire user community will require support for one or more mobile devices” (Ingerman et al., 2011, p. 34). As technology adoption rates decline, the IT equipment of NDSU’s students, faculty, and staff becomes increasingly diverse.

This mobility, diversity, and literally global expansion in the central IT unit’s support base represent an increasing challenge both for CITU and for its IT security. Central IT service units, like CITU, are being asked to expand their service base to include any IT product used by a student or employee at any time during the 24-hour day, 365 days per year, from any location (both on- and off-campus). When coupled with an operating budget that has not increased since 1999, NDSU customer needs are not easily met.

Depicted in NDSU’s IT provisioning pyramid (Figure 4), IT services above the dashed line are generally visible to the IT client, whereas IT services below the dashed-line

are generally not visible to the client. Unfortunately, as also depicted, the funding choices central IT units face too often are between “client demands” and “IT enabling services.” When a central IT unit chooses to prioritize IT items that are typically invisible to the user, such as the institution’s IT networks and infrastructure, the central unit is forced to move away from its clients. In this absence, the central IT unit may lose campus-wide credibility because of a perceived inability to meet client-service demands.

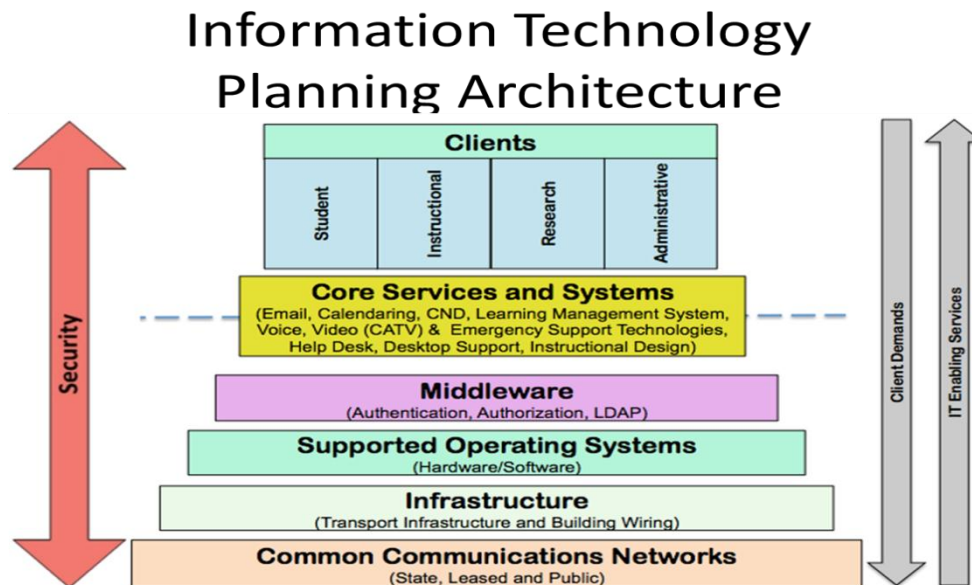


Figure 4. IT provisioning pyramid (NDSU, 2008)

As previously outlined, the identified issue in this body of action research is: “funding the technology of a research university.” This project compared NDSU non-student employee IT needs/requests to non-student employee perceptions of CITU in an effort to determine whether CITU’s budget played a role in either. Of note: CITU has

historically made budget decisions regarding campus IT product and service investments with minimal campus input.

Dual Role of the Participant/Observer

As a communication doctoral student at NDSU, I am a relatively novice researcher, operating under the tutelage of my committee. As the temporary leader of one of three departments within CITU, the central IT unit at NDSU, I am responsible for ensuring that my department spends its limited resources wisely in support of IT products and services that benefit NDSU. Thus, I hold dual roles; yet, like others who have traveled the dissertation path before me, I wanted to make a difference in the environment to which I belong.

As the participant/observer, my experiences, both academic and professional, made me uniquely qualified for this engaged work (Mumby & May, 2005). However, some of those same experiences also introduced more bias into this project than might otherwise have been present. Chapter Three described how this project used different methods of data collection to help control for the participant/observer's biases regarding the topic of funding the technology of a research university.

Professional Qualifications of the Participant/Observer. A certified public accountant, with majors in both accounting and management information systems, I began my professional career in public accounting in 1983. Two years later, I made the permanent transition into governmental accounting by spending five years as a fiscal analyst for the North Dakota (N. D.) Legislative Council (1985-1990). In my position as fiscal analyst,

reporting to the state's legislative branch, I drafted and analyzed the fiscal impact of state legislation, and I staffed the N. D. House and Senate legislative appropriation committees.

Coming to NDSU in 1991, I spent my first eight years in the controller's office working in a variety of accounting positions (1991-1999). For the first five years, I served as a general accountant, responsible for preparing the university's financial statements, unrelated business tax returns, and Integrated Postsecondary Education Data System (IPEDS) reports. During that same time (1991-1996), as a member of a six person financial advance team, I was sent to each of the 11 campuses within the N. D. university system to gather user input for a multi-million dollar ERP system configuration.

I then spent three years managing the NDSU business office (1996-1999). In the position of business office manager, I was responsible for collecting NDSU's revenue, student tuition, departmental funds, and for disbursing all student financial aid. Additionally, during that same eight year period (1991-1999), I simultaneously served as NDSU's internal auditor, responsible for conducting the university's cost studies, initiating a records retention program, and auditing persons and processes as called upon by the controller or any member of the president's cabinet.

In 1999, I began a six-year position in the NDSU president's office working as the director of special projects/internal auditor. In that position, I facilitated the development of an NDSU IT infrastructure schedule in which I projected that given the current funding levels; the campus would soon not have the funding to maintain its IT infrastructure. During those same years, I also continued to conduct institutional audits, and acted as a

liaison for NDSU's National Collegiate Athletic Association (NCAA) audits. Three additional major responsibilities I held during that period (1999-2005) included: 1) reporting to the State Board of Higher Education on the status of NDSU's strategic plan progress within the N. D. Roundtable Initiatives, a set of six cornerstones established in 1999 by a joint committee of 21 legislators and 40 members of the private sector; 2) serving under the N. D. university system chief information officer (CIO) as the 11 public institutions within the state prepared to move to a common ERP system for which I had helped establish financial configuration requirements; and 3) serving as a member of the state's ERP steering committee, which included the uncomfortable responsibility to vote with the steering committee that the system "go-live" before all campuses, including my own, NDSU, felt they were ready.

From 2005-2007, I reported to the vice president for business and finance as the director of special projects. In this role, I continued to report NDSU's strategic plan progress within the N. D. Roundtable Initiatives. I was also responsible for the completion of NDSU's 2006, 2007, and 2008 fiscal year annual budgets, as well as NDSU's 2007-09 biennial budget, jointly with the NDSU budget director and as NDSU's interim budget director (December 2006 – July 2007).

In late 2007, I was hired by the vice president of IT (CITU's leader) to serve as the chief IT planning officer. In that role, I directed NDSU's strategic long-range IT planning. In addition to my NDSU responsibilities, twice during that four-year period (2007-2011), I also served as the interim chief IT planning officer for N. D. State College of Science

(NDSCS), a sister-campus, located 45 miles south of NDSU in Wahpeton, N. D. At NDSCS, I conducted a gap-analysis of the campus' IT applications and services and developed a comprehensive IT plan for instructional equipment, instructional delivery, marketing and communications, recruitment, web management, administrative IT functions, IT infrastructure, and relationship management. Highlights of my work at NDSCS included the development of job descriptions for a campus CIO and an application developer, audits of the campus' infrastructure and ERP systems, and recommendations for the purchase and configuration of client relationship management (CRM) database application software.

In January 2011, following the retirement of the associate vice president for information technology services (ITS), one of four CITU departments, I accepted the interim role of assistant vice president for ITS and I continue to serve NDSU in that role. As the assistant vice president for ITS, I am responsible for the operations of five CITU's service areas: advanced applications and outreach, classroom support, desktop support, help desk, and instructional services. In this role, I also participate in the N. D. university system CIO advisory council meetings.

However, it was while serving in the role of CITU's chief IT planning officer, I thought about the long-dormant IT infrastructure schedule I had helped to create in 1999. As I remembered the schedule, I began to wonder why the funding warning, so clearly outlined in the plan, had not been heeded. As I pondered that question, my preparatory work toward my Ph.D. in communication, outlined below, provided me with valuable

insight into organizational communication that I did not possess in 1999 when I helped to create the schedule.

Research Qualifications of the Participant/Observer. As a life-long learner, I took my first communication course in 1999. At that time, I was seeking a master's degree to complement my two bachelor's degrees. Soon after I entered the program, NDSU began its Ph.D. program in communication, and I was asked to join the program as a direct-to-doctorate student. Given a career path that was already well established and a keen interest in the subject matter, I agreed.

My progress toward this degree has enabled me to experience the true science of the work and allowed me to begin my travels within the communication profession. One collaborative effort that resulted from a summer visiting scholar program that I attended lead by Dr. Sandra Petronio gave me the opportunity to learn CPM and apply it to my sister's battle with leukemia. Further CPM-collaborative work with Dr. Petronio took me to Minneapolis, Providence, and San Diego. Participating in these and other similar experiences gave three colleagues and me the confidence to apply for a Tri-College grant to examine leadership assessment comparability across the three campuses of Concordia College, MSUM, and NDSU. We received the grant and our paper from that work was published (Ostrom-Blonigen, Bornsen, Larson-Casselton, & Erickson, 2010) and accepted for presentation at the 2010 NCA Annual Convention in San Francisco.

In 2008, while serving as CITU's chief IT planning officer, I reached a pivotal point in the pursuit of my doctoral degree in communication. With my classroom work almost

complete, I needed to turn my attention to identifying a dissertation topic. For years, I had courted the topic of communication's role as a primary success factor in ERP system implementations. However, in 2008, as I remembered the IT infrastructure schedule I had helped to create in 1999, I knew that "funding technology," an issue that impacted the entire NDSU community, needed to be studied using the lens of CPM within organizational communication.

Research Questions

As proposed by the 2010 EDUCAUSE Current Issues Committee, "the time has come for IT leaders [within higher education] to accept the level of funding for technology as a given and begin to work with others on campus to determine what services can be offered within the allocated budget" (Ingerman et al., 2010, p. 49). To effectively perform in today's higher education environments where IT issues arise so quickly, IT leaders must possess "nimbleness in both thought and act" (Ingerman et al., 2011, p. 24). If IT is "essential to strategic decision-making [then] ... an institution [must work closely with its central IT unit to] determine what it wants from technology" (Grajek et al., 2012, p. 48). This project sought to begin a participatory action research (PAR) process within NDSU's central IT unit (CITU) to develop an initial planning document (Wadsworth, 1998; Walter, 2009) in November 2013 for NDSU stakeholder review prior to the 2013 legislative session.

In planning this project, the participant/observer had hoped to create the "initial planning" step in a broader PAR study. Following the first cycle of issue identification,

initial planning, action and observation; PAR, as depicted in Figure 5, is a repetitive methodology of reflection-informed planning, action, and observation. PAR studies are usually conducted by a participant observer/researcher, who, working with stakeholders, seeks to address an identified issue/problem (Wadsworth, 1998; Walter, 2009) while limiting her/his biases.

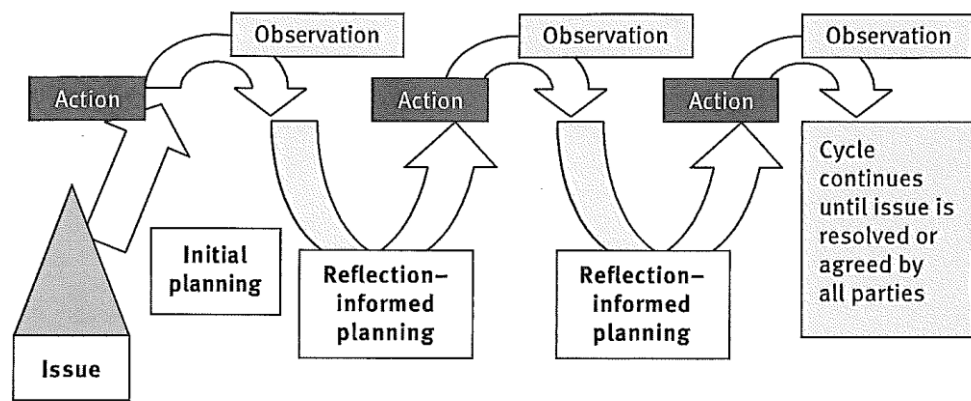


Figure 5. PAR (Participatory Action Research) diagram (Walter, 2009, p.3).

An applied action research method, PAR's most significant application comes when applied to issues/problems that "arise from the community of interest" (Walter, 2009, p. 3). As outlined in this chapter, the identified issue of this project: "funding the technology of a research university," is of great interest to the NDSU community. Cyclical in nature, PAR studies maintain a locus of control within a collaborative and committed community, yielding outcomes that may be more practical for the community in which they need to be

applied or enforced (Walter, 2009) and as such, are “particularly suited to practitioner based research” (Walter, 2009, p. 2).

PAR studies can be impractical because their problem solving criteria seeks community consensus and because of their inability to conclude the process within a specific timeline (Montoya & Kent, 2011; Walter, 2009). In 2006, a PAR approach used in the case study redesign of a high-school science course involving students with and without disabilities proved to be both “challenging and rewarding” (Dymond et al., 2006, p. 304). In 2010, a PAR approach used as an intervention in an urban middle school to gather student feedback on key processes within common settings was reported to reveal “multiple opportunities and challenges” (Ozer, Ritterman, & Wanis, 2010). More recently, a PAR approach designed to transition member-based involvement in the community health programs of a poor, urban, Spanish-speaking community into member-driven involvement also reported both rewards and challenges (Montoya & Kent, 2011).

In what the participant/observer hoped would be the first step in creating an initial document seeking to address the issue of funding the technology of a research university, the CITU vice president was interviewed and confirmed that funding was a primary IT issue at NDSU (B. Neas, personal communication, December 11, 2008). The participant/observer then used a survey instrument to ask NDSU non-student employees about their IT needs/requests. In the second study, NDSU non-student employees were also interviewed about their perception(s) of CITU. Each of these activities was designed for the purpose of beginning to answer the research question (RQ):

RQ: Could CITU's budget constraints be driving a reactive environment that is shaping its technological-change decisions in such a way that the impact on NDSU employees or NDSU as a whole is not considered? More specifically:

- RQ1: In what ways are CITU's budget constraints recognizable in the IT needs/requests of NDSU non-student employees?
- RQ2: In what ways are CITU's budget constraints recognizable in the perceptions of NDSU non-student employees?
- RQ3: In what ways are the responses of NDSU's non-student employees to RQ1 and RQ2 reflective of communication patterns of CPM?

Chapter Summary and Organization of Dissertation

Despite repeated requests and independent studies calling for additional funding, NDSU (Forum Editorial, 2011), and other public institutions of higher education (National Conference of State Legislators, 2010), often do not receive the basic operating support they need. Suffering from these types of funding shortfalls, as well as varying levels of political posturing (Eccher, 2012a), are the centralized IT operations of these campuses, which are traditionally almost totally funded from these dollars (National Conference of State Legislators, 2010). Without necessary funding, central operating units, like CITU, become overwhelmed in the daily challenge of meeting payroll obligations and paying the campus' hardware maintenance and software licensing contracts.

Due to these funding shortfalls, central IT units have difficulty committing to new product and service obligations. As a result, campus requests for new software programs

might be denied, or the maintenance or replacement of various systems and networking equipment might be delayed. In some instances (e.g., server hosting), CITU has begun charging NDSU departments for its services, a move that is not popular with the campus. Given the concerns for NDSU's overall budget, CITU has chosen to maintain relatively permeable communication boundaries with other NDSU departments regarding its budget by keeping its various liaison groups informed about changes that negatively impact its revenue streams or its expenditure lines.

A recent article in a local newspaper questioned why something is not being done to address NDSU's funding issues: "What is a perennially disappointing surprise is that the Legislature refuses to do enough for funding fairness and equity at the state's world-class land-grant university" (Forum Editorial, 2011, p. C6). NDSU's funding difficulties are well known to the group responsible for determining its budget, so what could be driving the conflict that has manifested itself in a lack of state funding support for the campus? From R. C. Smith and Eisenberg, we learned that, "organizational members sometimes hold divergent world views that can lead to deep-seated, unrecognized second-order conflicts" (1987, p. 368).

As a result, when making requests of CITU, campus users are not in a position to consider that the unit's "invisible" funding obligations might be driving CITU's decisions to refuse their request. Additionally, campus users do not always consider the impact their decentralized IT purchase decisions or grant awards might have on CITU's resources. As a result, it is possible that campus users may not link their dissatisfaction with CITU to

budget constraints, resulting in “differences in world-views” (R. C. Smith & Eisenberg, 1987, p. 368) between the IT services and products campus users require/desire and what CITU can afford.

This project explored whether the budget and technology challenges of NDSU’s CITU might be driving user perceptions about CITU that manifest themselves as stakeholder communication challenges for the central IT unit. On a higher education campus, the stakeholders or users of the central IT unit’s products and services are comprised of students, faculty, staff, other university affiliates, or stakeholders. These groups of users have very diverse IT needs and can be very vocal about their perceptions of the central IT unit.

Chapter One outlined the current relevance of this project for institutions of higher education and the central IT units that serve those institutions. This chapter also revealed the proposed parameters of the project, including how budget and technology issues might be manifesting themselves as communication issues for CITU. In addition, this chapter spelled out the known delimitations of this project. Finally, the chapter reflected upon the importance of seeking stakeholder input to better understand and more accurately extend the conversations related to the budget and technology issues facing central IT units, like CITU, within higher education.

Chapter Two will examine how theory-based literature of organizational communication has evolved during this transformational period from mainframe computing to the vastly disparate and distributed use of personal computers and other

smart-devices, particularly in higher education. In addition, the chapter outlines why the participant/observer believed it was appropriate to extend the theory of CPM from its traditional place in interpersonal communication arena into the organizational communication arena of this project. Finally, Chapter Two addresses the delimitations of the project, described the historical uses of CPM and outlined plausible extensions of CPM related to this project.

Building on the previous project work, Chapter Three described how the participant/observer used a survey of non-student employees to collect campus IT needs/requests. Additionally, the chapter discusses how the survey data, together with interviews of NDSU non-student employees regarding their perceptions of CITU, might be used to extend organizational communication theory. This chapter also described the procedures for and the measures used in conducting the two studies. Finally, Chapter Three describes how these methods might be compared to provide a combined data set for review.

Chapter Four presents the data collected in the project in response to the surveys and interviews of non-student employees. In this chapter, the participant/observer describes the transition between the two studies and how the findings of both studies were categorized. Finally, in this chapter, observations are made about each category and comparisons were made against previous results.

Chapter Five describes the project outcomes. Additionally, observations are advanced regarding those outcomes that discussed the theoretical and practical implications

of the project findings. This chapter also entertains the notion of initiating a PAR process regarding the funding of technology on the NDSU campus using this dissertation as an initial planning document. Finally, the chapter reflects on the future implications of these findings for CPM, CITU, and NDSU.

The potential benefits of this project include providing communication guidance for institutional leaders seeking to make the best use of their limited budgets. In addition, the factors outlined in this project may prove useful for CITU, and other central IT units like it, in identifying which campus IT needs/requests should be funded. The final purpose of this project was to determine how these conversations might be used in a PAR approach to increase the campus-wide credibility of CITU.

CHAPTER TWO. LITERATURE REVIEW

“The failure to [fully] investigate potential differences in world-views may prevent researchers and practitioners from understanding the true sources of overt conflict, and as a result, from understanding why conflict may not be effectively managed over time”

(R. C. Smith & Eisenberg, 1987, p. 368)

This chapter explores how/whether the IT needs/requests of NDSU’s non-student employees and their perceptions of their central IT unit (CITU) could be tied to communication facets found in both the organizational and interpersonal literature. This chapter also describes why the participant/observer believed the traditional world-view of interpersonal communication could be applied within the organizational setting of NDSU. Finally, this chapter describes how the participant/observer planned to apply the theory of Communication Privacy Management (CPM) and its propositions and the communication facets of disclosure and nondisclosure motivations, relationship satisfaction or dissatisfaction, topic avoidance, and communication turbulence to the interviewee responses of NDSU non-student employees.

Organizational Communication Theory

As outlined in Chapter One, twenty-one years ago, referencing the rapidly changing environment of IT within organizations, Steinfield and Fulk worried, “contemporary organizational theory is ill-equipped to cope” (1990, p. 13). At that time, theory, when applied, chased each new technology as it was introduced, resulting in isolated arguments and models (Steinfield & Fulk, 1990). Since 1990, researchers have attempted to

incorporate organizational and communication theory into their studies of technology, which has served to “motivate integrated programs of research” (Steinfeld & Fulk, 1990, p. 13).

IT Funding in Organizational Studies

In the IT arena, funding has emerged as one of the most significant issues organizations face (Ingerman et al., 2011; Ingerman et al., 2010). Yet, research integrating IT funding to organization stakeholder engagement in IT funding discussions is limited. In 2011, Ghosh wrote: “the complexity of Information Technology (IT) projects are determined not by what you can easily see (the technology), but what is hidden and less apparent – the organizational issues” (p. 92). Funding has also been linked to IT as a factor associated with technological advancements (Ashraf, Hashmani, & Chowdhry, 2008; Cauvin, Le Guillou, & Lecornu, 2008; Kurdy, 2006). In addition, funding has also been used to highlight organizational IT governance (Henry, Kirsch, & Sambamurthy, 2005). However, all too frequently the IT department functions independently of the business department, resulting in a governance arrangement of “responsibilities without authority or authority without responsibility” (Henry, Kirsch, & Sambamurthy, 2003, p. 752) and poor project planning; such an arrangement makes project planning difficult.

In most of the prior IT funding research, with two notable exceptions (McConnell, 1998; Srinivasan & Fisher, 1995), budget has been studied as a fixed value or variable related to an IT system or service. One group of researchers, however, examined the pressure that both budget and schedule place on software-development cycle time and

effort (Nan & Harter, 2009; Nan, Harter, & Thomas, 2005). Not surprisingly, the research showed that “budget pressure has received little attention” (Nan & Harter, 2009, p. 624). McConnell (1998) suggested splitting IT software projects into smaller work units, called feasibility studies, to avoid funding over-commitment and progress under-commitment. Srinivasan and Fisher (1995) discussed the importance of preparing an accurate software development estimate to avoid over- or under-committing resources.

Budget pressure is defined as the difference between what a development team estimates a project will cost and what the client can afford or is willing to pay for the project (Nan & Harter, 2009). Working with an international technology firm, Nan and Harter (2009) studied 66 projects and found a statistically significant relationship between budget pressure and its effect on development-cycle time and development effort, such that a high level of budget pressure may negatively impact both development-cycle time and development cycle. Within organizational groups, budget pressure relationships can create a “high level of pressure [which] often creates too much challenge for employees to handle” (Nan & Harter, 2009, p. 627), making it difficult for software developers to succeed in meeting the client expectations.

Budget/funding play an important role in IT solutions and operations (Henry et al., 2003; McConnell, 1998; Nan & Harter, 2009; Nan et al., 2005; Srinivasan & Fisher, 1995). In 1996, The Standish Group found that of the 360 organizations studied, 42% reported funding IT projects that were never completed (Griffith, Zammutoo & Aiman-Smith, 1999). In addition, some IT projects far exceed original budget projections; in 2010, the

new online payroll system for New York City exceeded its projected budget by more than \$640 million (Kanaracus, 2010). How then, if at all, do the pressures of budget and technology contribute to users' perceptions about their central IT unit?

Perception in Organizational Studies

Perceptions, right or wrong, drive communication interactions between parties (Davis & Burnett Pettus, 1992; Ghosh, 2011; Littlefield, 2001; R. C. Smith & Eisenberg, 1987; Whitbred, 2003). In an effort to better understand the role of communication in the development and sustenance of organizational perceptions about CITU, this project also sought to identify how the NDSU campus users perceived CITU. Once acknowledged, CITU user perceptions were reviewed in an effort to identify whether their root source (R. C. Smith & Eisenberg, 1987) could be linked to a lack of campus budget resources or whether the organizational context (Kupritz & Cowell, 2011; Sundstrom, De Meuse, & Futrell, 1990) of budget might prove too private to register in the perceptions of NDSU's employees. Ghosh contended that, "stakeholders have different perceptions of an [Inter-Organizational System] IOS and how it fits into their business models both at the operational and strategic levels" (2011, p. 92).

In addition to performance, perceptions of IT worth or value also have been linked to the interpersonal competencies of IT employees (H. A. Smith & McKeen, 2010). To be successful in today's technological and global environments, IT organizations must work to more fully develop the interpersonal competencies of their employees (H. A. Smith & McKeen, 2010). Interpersonal competencies also are considered necessary to reduce

interpersonal complaints (H. A. Smith & McKeen, 2010); understanding that there may be a connection between interpersonal complaints and negative perceptions of a central IT unit was important to the participant/observer's analysis of the project responses.

Why CPM?

Native to the interpersonal communication-studies discipline, the theory of Communication Privacy Management (CPM) (Petronio, 2000, 2002) has not yet substantially been vetted in organizational communication. More readily linked to family studies, CPM has been used in “predicting and explaining boundaries and the regulation of revealing and concealing private information in dyadic, family, group, or organizational systems” (Baxter & Braithwaite, 2008, p. 282). Not yet fully examined in the organizational arena, the participant/observer believed that the CPM propositions of “co-ownership” and “negotiated rules,” as defined in the CPM literature (later in this chapter), could be especially useful in navigating the organizational communication boundaries that both permitted and restricted the flow of traditionally private budget information between central IT units, like CITU, and their campus.

In dyadic systems, CPM has been used to describe topic avoidance and relational turbulence (Caughlin & T. D. Afifi, 2004). Common communication facets linked to CPM that emerge from these studies include disclosure and nondisclosure motivations (Caughlin & T. D. Afifi, 2004; Petronio & Durham, 2008), relationship satisfaction and dissatisfaction (Caughlin & T. D. Afifi, 2004), topic avoidance (T. D. Afifi, 2003; Caughlin & T. D. Afifi, 2004), and communication turbulence (T. D. Afifi, 2003).

In organizational systems, topic or conflict avoidance also has been linked to the absence of interpersonal communication skills (Salem, 2008) or competencies. Although peppered within the literature (Conner & Strobel, 2007; Gale, Wojan & Olmsted, 2002; Kamaria & Lewis, 2009; Wu, Chen & Greenes, 2009), interpersonal skills/competencies remain relatively undefined. Interpersonal skills/competencies have been described as soft skills, “complex in nature, yet critical in maintaining harmonious relations in expedition settings . . . [which] in turn, affects the goals and safety of the group” (Phipps & Swiderski, 1990). In the organizational setting, interpersonal skills/competencies are considered important in not-for-profit general management positions (Kamaria & Lewis, 2009); leadership capability development in youth (Conner & Strobel, 2007); use of production and telecommunications technologies and work organization (Gale, Wojan & Olmsted, 2002); and technology leadership in healthcare (Wu, Chen & Greenes, 2009).

Additionally, within the organizational literature, employee perceptions have also been linked to the same four communication facets also found in the CPM literature of 1) communication disclosure and nondisclosure motivations (Sussman, 2008), 2) relationship satisfaction and dissatisfaction (Klaus, 2011), 3) topic avoidance (Salem, 2008), and 4) communication turbulence (Salem, 2008). For the participant/observer, these connections helped in this attempt to extend CPM, a traditionally interpersonal theory, into the organizational communication arena.

The Theory of CPM

With acknowledgment to social psychology (Baxter & Braithwaite, 2008), particularly Altman's privacy regulation work (Allman, 1998; Margulis, 2003; Morr Serewicz & Petronio, 2007; Petronio 2004), CPM was originally dubbed communication boundary management (Petronio, 2000, 2002). CPM has been used as a "method of understanding the ways people manage the dialectical tensions of disclosing and protecting privacy" (Petronio & Jones, 2007, p. 202).

Governed by five principles (Duggan & Petronio, 2009; Petronio, 2007b, 2009a), or suppositions (Morr Serewicz & Petronio, 2007), or (with the later addition of boundary turbulence) by six principles (Petronio & Durham, 2008), or propositions (Child, Pearson, & Petronio, 2009), CPM uses the metaphor of boundaries to examine how private information is both controlled and shared (Petronio, 2000, 2002). A rules-based privacy management system, CPM is comprised of levels of boundary structures of varied permeability (T. D. Afifi, 2003; Petronio, 2000, 2002, 2009a). The six propositions of CPM used in this project are 1) ownership, 2) control, 3) rules, 4) co-ownership, 5) negotiated rules, and 6) boundary turbulence (Child, et al., 2009). In this section, the six propositions are further examined.

Ownership Proposition. CPM acknowledges both the sharing of private information and the boundaries that surround that information (Petronio, 2002). Boundary structures have different levels (Petronio, 2000) that accommodate alliances (Golish & Caughlin, 2002) or hierarchies. Boundaries are either permeable, allowing information to

move internally and externally, or impermeable, intentionally impeding information flow (Morr Serewicz & Petronio, 2007; Petronio, 2010). Communication boundaries can also be raised in an attempt to save face (Faulkner & Mansfield, 2002). For the purposes of this project, the participant/observer and the independent coders reviewed the interviewee transcripts looking for examples of communication boundaries that reflected the flow (permeability) or absence (non-permeability) of conversations/information regarding CITU's budget across the NDSU campus.

Control Proposition. Information ownership is revealed in the constructing of boundary signals (T. D. Afifi, 2003; Duggan & Petronio, 2009; Petronio, 2007b). Communication privacy boundaries afford the information owner a sense of control (Allman, 1998; Duggan & Petronio, 2009) and are often developed to be compatible with the owner's existing relationship levels (T. D. Afifi, 2003). Boundaries can be permeable, allowing information sharing, or rigid, restricting information sharing (Caughlin & T. D. Afifi, 2004; Golish & Caughlin, 2002). Inevitably, because there is an inherent risk in sharing private information, individuals seek to manage that risk by controlling what information they share with others (T. D. Afifi, 2003; Allman, 1998; Duggan & Petronio, 2009; Morr Serewicz & Petronio, 2007). For the purposes of this project, the participant/observer and the independent coders reviewed the interviewee transcripts looking for examples of communication boundary signals that reflected a controlling of conversations/information regarding CITU's budget across the NDSU campus.

Rules Proposition. Privacy rules typically mirror values. Rules, stated or unstated, govern the exchange of information (T. D. Afifi, 2003; Golish & Caughlin, 2002; Helft & Petronio, 2007; Petronio, 2000, 2002) in family (T. D. Afifi, 2003), marital (Petronio, 1991), and organizational settings. Complex relationships produce complex rule systems (Golish & Caughlin, 2002; Helft & Petronio, 2007; Morr Serewicz & Petronio, 2007; Petronio, 2010).

Viewed from a CPM perspective, the dialectical tension between revealing and concealing is very real (T. D. Afifi, 2003; Petronio, 2000, 2002). In an effort to ease that tension, rules are established in many communication relationships to enforce boundaries surrounding/guarding private information. As rules are developed, communication boundaries usually become less permeable. Although “families, organizations, and many other groups teach their new members existing rules” (Morr Serewicz & Petronio, 2007, p. 265) through the cultural sharing of expectation, disclosure rules can also be negotiated. Over time, rules no longer have to be thought about or practiced; they become second nature (Caughlin & T. D. Afifi, 2004; Faulkner & Mansfield, 2002; Morr Serewicz & Petronio, 2007; Petronio, 2000, 2002).

Privacy rules that are negotiated or transactional in nature (Greene & Serovich, 1996) usually are established based on three discloser factors: “expectations of the discloser, message strategy, and message content” (Greene & Serovich, 1996, p. 51). For example, when members of an organizational unit are linked within their unit’s unique privacy boundary, over time, the members who disclose private information within the

unit's boundary can be fairly certain about how the other members will act as co-owners of that information. For the purposes of this project, the participant/observer and the independent coders reviewed the interviewee transcripts looking for examples of communication rules in conversations/information regarding CITU's budget across the NDSU campus.

Co-ownership Proposition. Co-ownership, the sharing of "private" information, introduces a change in boundary dynamics between individuals or relational groups (T. D. Afifi, 2003; Petronio, 2000). According to Petronio (2002), information owners and their recipients "shape and alter boundary permeability needs through the co-construction process and full consideration of ownership" (Child et al., 2009, p. 2081). At times, given situations and events, as in marital (Petronio, 1991) and stepfamily (T. D. Afifi, 2003) relationships, the flow of information between parties becomes more regulated (Petronio, 2000, 2002), and more information is concealed. Information disclosures can place the recipient in a position of power (Petronio, 2009b, 2010), especially if the disclosure catalyst is emotion (Petronio, 2010). Similarly, disclosure can make the discloser vulnerable (Serewicz & Petronio, 2007). For the purposes of this project, the participant/observer and the independent coders reviewed the interviewee transcripts looking for examples of information disclosures that might reflect co-ownership in conversations/information regarding CITU's budget message across the NDSU campus.

Negotiated Rules Proposition. Individuals and groups use these rules to manage their communication decisions (Caughlin & T. D. Afifi, 2004; Petronio, 2000, 2002).

Negotiated privacy rules govern collective communication boundaries and give individuals within the collectively held boundary the ability or the right to share information with those outside the boundary (Petronio & Caughlin, 2006). At times, information owners are unwilling (Morr Serewicz & Petronio, 2007) to share their information, and at other times, co-owners have knowledge but are prohibited from sharing what they know (Golish, 2003; Petronio, 2010). For the purposes of this project, the participant/observer and the independent coders reviewed the interviewee transcripts looking for examples of communication sharing decisions that might reflect negotiated rule decisions regarding whether/how CITU's budget message is communication across the NDSU campus.

Boundary Turbulence Proposition. The final proposition is boundary turbulence. A change or an event, unexpected, intentional, or simply perceived, in predictable conversation patterns or in communication rules can cause communication boundary turbulence (T. D. Afifi, 2003; Petronio, 2000, 2002). Additionally, when relationships are altered as a result of a new or situational grouping of individuals (Golish & Caughlin, 2002), a significant change (e.g., funding shortfall or technology innovation), or life event (T. D. Afifi, 2003; Petronio, 2000), privacy boundary rules may change.

In their work with family members, Petronio and Caughlin (2006) found: "Boundary coordination may be compromised when rule expectations are fuzzy to one of the shareholders, when the context of the situation is defined differently by one or more . . . members, or when assumptions about informational ownership are dissimilar" (p. 46). Privacy breaches may occur or be triggered by boundary turbulence (Duggan & Petronio,

2009), or when attempts to control or coordinate the communication of private information fail (Morr Serewicz & Petronio, 2007). For the purposes of this project, the participant/observer and the independent coders reviewed the interviewee transcripts looking for examples of communication difficulties that might reflect communication boundary turbulence regarding CITU's budget conversations across the NDSU campus.

CPM's Use in Interpersonal Communication

In health communication, CPM has been used to explain the physician-patient dyadic when physicians neglect their disclosure obligations (Helft & Petronio, 2007). In family health situations, CPM helped to describe privacy-boundary relationships that develop when family and friends serve as healthcare advocates (Petronio, Sargent, Andea, Reganis, & Cichocki, 2004). Additionally, CPM has been used to describe the privacy-boundary relationships that occur when a young child (Duggan & Petronio, 2009), or an adult (Ostrom-Blonigen, 2007; Petronio & Ostrom-Blonigen, 2008a; Petronio & Ostrom-Blonigen, 2008b), becomes seriously ill. CPM work also has been used in research involving physicians and their families as they seek to navigate work boundaries (Petronio, 2006).

In one health communication research study, Greene's integrated model of health disclosure decision-making (2009) found that tighter communication boundaries do not necessarily lead to response confirmation (Petronio, 2002; Petronio & Reiersen, 2009). Whereas, in health communication groups, researchers have used CPM to gain a better understanding of boundary management rules (Petronio, Reeder, Hecht & Mon't Ros-

Mendoza, 1996), to assess the appropriateness of health-diagnosis disclosures (Greene & Serovich, 1996), and to investigate the privacy concerns of nursing-home residents (Petronio & Kovach, 1997).

CPM has also been employed in family systems. Specific efforts in this area include triangulation, loyalty conflicts, and the formation of various alliances (T. D. Afifi, 2003; Golish & Caughlin, 2002). In her work with stepfamilies, T. D. Afifi (2003) found that meta-communication, described as communication about communication (Bateson, 1951), or “directly confront[ing] the person with whom there is a problem” (T. D. Afifi, 2003, p. 744) to be the most successful method in minimizing boundary conflicts. Finally, within group systems, CPM has also provided a better understanding about the communication boundaries of other cultures (Faulkner & Mansfield, 2002). For example, CPM has been used to measure the privacy rules employed by college-student bloggers (Child et al., 2009).

Extending CPM into Organizational Communication

In 2005, Mumby and May challenged scholars within the organizational communication community to engage in ways that “upsets our commonsense views of how things work” (p. 2), while still seeking “to convey the intimate connection between theory and practice” (p. 3). Mumby and May believe that communication scholarship is advanced through many factors, including economic (2005). Using the four facets of communication described earlier of: 1) communication disclosure and nondisclosure motivations; 2) relationship satisfaction or dissatisfaction; 3) topic avoidance; and 4) communication

turbulence, the participant/observer and the independent coders reviewed the interviewee transcripts for indications of communication boundaries linking the propositions of CPM theory within the NDSU campus communication practices involving CITU.

Prior attempts have been made to extend CPM into the organizational communication arena (Golish & Caughlin, 2002; Petronio, 2002; Petronio & Durham, 2008). This project using CPM could prove to be an important step in introducing the theory (Golish & Caughlin, 2002) into organizational communication (Petronio & Durham, 2008). CPM has already been used to describe communication privacy boundaries in health care, education, and organizations (Petronio & Durham, 2008). Tracy (2008) believes that CPM can be used both to describe organizational information boundaries and to maneuver between interpersonal and organizational communication. CPM's true strength resides in its application to both disciplines (Tracy, 2008) and in "its utility and heuristic value in both basic and applied research" (Petronio & Durham, 2008, p. 319).

The goal of this project was to apply CPM's six propositions (Child, et al., 2009) to user perceptions of one central IT unit within an institution of higher education and to determine whether four facets of interpersonal communication, which are also applicable in organizational settings, could be identified in the study data as previously described. The four communication facets that emerged as the categories for this study due to their presence in both the CPM and the organizational communication literature will be further examined.

Communication Facet: Disclosure and Nondisclosure Motivations

The first communication facet linked to both CPM and organizational communication examined in this project is communication disclosure and nondisclosure motivations. Disclosure and nondisclosure motivations are a function of information ownership. Private information is often disclosed, inviting co-ownership, to “solve a problem, or create a new system” (Petronio, 2007b, p. 218). Additionally, some people are required to disclose due to their profession (Helft & Petronio, 2007), while others, who co-own information as in a patient-physician relationship (Helft & Petronio, 2007), are (at times) willing to let others control the disclosure of their information (Morr Serewicz & Petronio, 2007).

Families generally share information in ways that honor their family values (Child et al., 2009; Morr, 2002; Petronio, 2000, 2002), just as organizations generally operate in ways that honor their organizational values (Hoffman, Bynum, Piccolo, & Sutton, 2011). In this way, messages that fit a value system are accepted while messages that do not fit are rejected (Faulkner & Mansfield, 2002). Expectations, strategy, and content are all linked to disclosure decisions (Greene & Serovich, 1996; Morr Serewicz & Petronio, 2007; Petronio, 1991, 2010).

In relaying information, the discloser sometimes feels pressure, real or perceived, from the recipient of the disclosure to take action or to make a change: “Unsolicited advice occurs and has consequences in all kinds of communication contexts: the workplace, the classroom, the home” (Petronio & Jones, 2007, p. 215). Some disclosers, predicting

negative consequences, are less likely to relay information to others (Petronio et al., 1996). Additionally, when messages are received, recipients, based on their background or on the uniqueness of the situation (Faulkner & Mansfield, 2002), may interpret those messages differently.

Regardless, in the “process of knowing[,] . . . the recipient [becomes] co-owner, shareholder, or stakeholder” (Duggan & Petronio, 2009, p. 123). As a co-owner, the recipient is both responsible for safekeeping the information and accountable to the discloser for additional dissemination of that information (Petronio & Caughlin, 2006). Just as individuals in personal relationships “allow personal motivations . . . to outweigh the culturally shared value placed on openness in relationships” (Caughlin & T. D. Afifi, 2004, p. 482), organizational employees sometimes allow personal motivations or perceptions to outweigh the organization’s culturally shared value of openness or secrecy.

In an organizational setting, “openness” has been linked to disclosure (Petronio, 2002; Steele, 1975) and given prominence (Baird, 1977; Jablin, 1982; Petronio, 2002). EDUCAUSE’s 2010 call to bring others into the previously private IT product and service selection process (Ingerman et al., 2010) is about openness, as is its 2012 call to integrate IT into institutional decision-making (Grajek, et al., 2012). Organizational boundaries must be permeable enough to allow for co-ownership of certain constraints (such as budget and technology), but not so permeable that innovative thought is discouraged or control is abdicated. With both a negative and a positive side (Steele, 1975), the disclosures that result from an open organizational environment, “both enhance and impede workers’

performance” (Petronio, 2002, p. 170). For the purposes of this project, interviewee transcripts were reviewed by the participant/observer and the independent coders for the facet of “communication disclosure and nondisclosure motivations.”

Communication Facet: Relationship Satisfaction and Dissatisfaction

The second communication facet linked to both CPM and organization communication examined in this project was relationship satisfaction and dissatisfaction. Acknowledging that previous relationship experiences, positive or negative, can impact disclosure, relationship satisfaction or dissatisfaction usually stems from a disclosure decision. In socializing, we learn about privacy rules (Petronio, 2002; Petronio & Durham, 2008); “as people join groups, organizations, and new families they also are instructed by others about the expected way to manage privacy” (Petronio & Durham, 2008, p. 312). For the purposes of this project, interviewee transcripts were reviewed by the participant/observer and the independent coders for the facet of “relationship satisfaction and dissatisfaction”

Communication Facet: Topic Avoidance

The third communication facet linked to both CPM and organization communication examined in this project was topic avoidance. The parties involved in topic avoidance usually hope to escape conflict (T. D. Afifi, 2003), fear a relational situation will further deteriorate if it addressed (Caughlin & T. D. Afifi, 2004), or believe that the relational issues surrounding the issue really are not that important (Caughlin & T. D. Afifi,

2004). Topic avoidance is a decision to not engage in or to avoid any conversation regarding a certain subject matter (Petronio, 2002).

CPM has also been used in stepfamily research to describe topic avoidance and relational dissatisfaction between parents and young-adult children (Caughlin & T. D. Afifi, 2004). When topic avoidance is engaged, social connections can be developed, in an attempt to protect one or more parties in the relationship (W. A. Afifi & Guerrero, 2000; Caughlin & T. D. Afifi, 2004; Golish & Caughlin, 2002; Helft & Petronio, 2007), restricting that particular topic from conversation and, as a result, an impermeable boundary is developed (Caughlin & T. D. Afifi, 2004; Child, Pearson, & Petronio, 2009; Golish & Caughlin, 2002).

Topic avoidance has been successfully used in this manner in stepfamilies (T. D. Afifi, 2003), as well as other relationships, for its positive (Caughlin & T. D. Afifi, 2004; Caughlin & Petronio, 2004; Golish & Caughlin, 2002) and protective (T. D. Afifi, 2003) functions. More recently, topic avoidance was discovered in the lack of communication between parents and their teens in their negotiations regarding the teen's Internet disclosures (Petronio, 2010). For the purposes of this project, interviewee transcripts were reviewed by the participant/observer and the independent coders for the facet of "topic avoidance"

Communication Facet: Communication Turbulence

The fourth facet of CPM to be examined in this project was communication turbulence. Un-negotiated rules can cause communication turbulence (T. D. Afifi, 2003).

As a result, some organizations, including medical institutions (Allman, 1998), set their employees' communication boundaries. Conversely, extreme situational conditions or significant events (T. D. Afifi, 2003; Petronio, 2000, 2010), such as a medical crisis (Duggan & Petronio, 2009; Ostrom-Blonigen, 2007; Petronio, 2000), or the firing of a university president, might cause the parties involved to ignore previously established communication privacy rules or to enforce stricter privacy boundaries.

With relationships, come alliances: "Alliances may be a way to maintain control over ... turbulence" (T. D. Afifi, 2003, p. 735). Alliances are usually formed with the hope of getting control of a situation (T. D. Afifi, 2003). One form of alliance, called triangulation, results in altered information exchanges between the discloser and different people and/or groups (T. D. Afifi, 2003). Triangulation, usually a consequence of a conflict in loyalty (T. D. Afifi, 2003), is caused by "inappropriately enmeshed communication privacy structures . . . and . . . use of privacy coordination rules" (T. D. Afifi, 2003, p. 748).

Additionally, at times, as in some stepfamily relationships (T. D. Afifi, 2003), revealing information can be risky. Triangulation can be an acceptable response to boundary turbulence (T. D. Afifi, 2003). In her work with stepfamilies, T. D. Afifi discovered that "one of the most useful positive coordination efforts used to minimize loyalty conflict was openness and direct confrontation" (2003, p. 744). For the purposes of this project, interviewee transcripts were reviewed by the participant/observer and the independent coders for the facet of "communication turbulence"

Research Questions

Given the literature review, the following research question emerged to address the issue/problem of funding the technology of a research university. Circling back to the project introduction, could CITU's reactive budget-driven environment shape CITU's technological-change decisions in such a way that the impact on NDSU employees or NDSU as a whole is not considered? Specifically:

- RQ1: In what ways are CITU's budget constraints recognizable in the IT needs/requests of NDSU non-student employees?
 - The answer to this research question was based on participant responses to survey questions asked of NDSU non-student employees in Study #1.
- RQ2: In what ways are CITU's budget constraints recognizable in the perceptions of NDSU non-student employees?
 - The answer to this research question was based on interviewee responses to an open-ended interview question asked of NDSU non-student employees in Study #2.
- RQ3: In what ways are the responses of NDSU's non-student employees to RQ1 and RQ2 reflective of communication patterns of CPM?
 - The answer to this research question was based on whether the NDSU non-student employee participant and interviewee responses in Study #2 reflected the six CPM propositions (Child, et al., 2009) of 1) ownership, 2) control, 3) rules, 4) co-ownership, 5) negotiated rules, and 6)

boundary turbulence and the four organizational and CPM communication facets of 1) communication disclosure and nondisclosure motivations, 2) relationship satisfaction and dissatisfaction, 3) topic avoidance, or 4) communication turbulence.

Chapter Summary

This chapter examined the organizational literature related to IT funding and organizational perceptions. In addition, this chapter sought to respond to the question of “Why CPM?” by examining the six theory propositions and CPM’s use in interpersonal communication. This chapter then illustrated the connections between CPM and organizational communication using four facets of communication recognized in both organizational communication and CPM literature. Finally, this chapter identified the research question and three sub-questions that drove this project.

CHAPTER THREE. METHODS

“Qualitative research involves the studied use and collection of a variety of empirical materials: case study; personal experience; introspection; life story; interviews; artifacts; cultural texts and productions; observational, historical, interactional, and visual texts-that describe routine and problematic moments and meanings...”

(Denzin & Lincoln, 2003, p. 5)

This project used two methods of data collection: 1) a campus-wide online email survey (Study #1) of NDSU non-student employees (Appendix B) and 2) interviews (Study #2) with NDSU non-student employees. Both studies were undertaken in an effort to determine whether CITU stakeholders’ input regarding their perceptions of NDSU’s IT needs/requests and of CITU showed stakeholder-recognition of CITU’s budget constraints. This chapter describes the two methodologies used and details the demographics of both the survey participants and the interviewees. This chapter also outlines the procedures of both studies and the measures used to analyze participant and interviewee responses for comparison purposes to decide whether CITU’s budget constraints were known to its stakeholders and in an effort to examine, using CPM, how the traditionally private world of CITU’s budget might be contributing to discord between CITU and the NDSU campus. Additionally, this chapter addresses the project delimitations identified in Chapter One.

In qualitative studies, “surveys [Study #1] are a valuable exploratory method” (Lindlof & Taylor, 2002, p. 119), while interviews [Study #2] “are well suited to understand the social actor’s experience and perspective” (Lindlof & Taylor, 2002, p. 173).

However, it is in the combination of both survey and interview methods that the researcher can both identify topic conditions (Fontana & Frey, 2003) or opinions (Lindlof & Taylor, 2002) and provide process or practice data (Fontana & Frey, 2003; Lindlof & Taylor, 2002; Mason, 1994). Once the conditions/opinions are identified in the survey research, the participant/observer is able to combine that work “by relying on unstructured interviews and ethnographic observations” (Fontana & Frey, 2003, p. 65).

Study #1: Survey of NDSU Non-student Employees

Survey Participants

A total of 244 employees participated in the 2009 campus-wide survey. Although an additional 36 surveys were initiated, none of them contained any data. Of the participants, 120 ($n = 244$; 49.2%) were men, 119 ($n = 244$; 48.8%) were women. Five participants ($n = 244$; 2.0%) chose not to report their gender. Twenty-two participants reported their ages as 23 to 29 years old ($n = 244$; 9.0%), 61 as 30 to 39 ($n = 244$; 25.0%), 53 as 40 to 49 ($n = 244$; 21.7%), 63 as 50 to 59 ($n = 244$; 25.8%), 23 as 60 to 69 ($n = 244$; 9.5%) and two as age 73 ($n = 244$; 0.8%). Twenty participants ($n = 244$; 8.2%) did not report their age.

Participants were also asked to identify the NDSU division or unit in which they were employed, as follows: four reported working in the division of the president ($n = 244$; 1.6%); 57 in the division of the provost and academic affairs ($n = 244$; 23.4%); 31 in the division of agriculture ($n = 244$; 12.7%); two in the division of equity, diversity, and global outreach ($n = 244$; 0.8%); 11 in finance and administration ($n = 244$; 4.5%); 24 in the

division of information technology ($n = 244$; 9.9%); 14 in the division of research, creative activities, and technology transfer ($n = 244$; 5.8%); 23 in the division of student affairs ($n = 244$; 9.4%); and four in the division of university relations ($n = 244$; 1.6%). Thirty-five participants ($n = 244$; 14.3%) indicated they were either “not sure” of the division in which they reported or that their “division was not listed.” An additional 39 participants ($n = 244$; 16.0%) did not report their division of employment.

Five participants indicated their highest terminal degree as high school diploma ($n=244$; 2.0%), 29 as associate’s degree ($n=244$; 11.9%), 60 as bachelor’s degree ($n=244$; 24.6%), 51 as master’s degree ($n=244$; 20.9%), and 93 as doctorate degree ($n=244$; 38.1%). Six participants ($n = 244$; 2.5%) did not list a terminal degree. Nine participants also stated their employment status as part-time ($n = 244$; 3.7%) and 231 participants as full-time ($n = 244$; 94.7%). Four participants ($n = 244$; 1.6%) did not indicate their employment status.

The 244 participants also were asked whether they served as a member on one or more of the CITU-sponsored committees, including: one participant indicated membership on the IT council ($n = 244$; .4%), none on an IT council subcommittee ($n = 244$; 0%), 12 on the IT tech group ($n = 244$; 4.3%), eleven on the telephone administrators group ($n = 244$; 3.9%), 13 on the IT communication liaison group ($n = 244$; 4.6%), and three on the student technology fee advisory committee ($n = 244$; 1.1%). Five of the participants ($n = 244$; 1.8%) indicated another involvement with CITU. The remaining 235 participants ($n = 244$; 83.9%) did not admit to any liaison relationship with CITU.

Not all participants responded to the four open-ended questions regarding campus IT services. Seventy-six participants ($n = 244$; 27.1%) responded to the question regarding their priorities for IT services during the next five years (Q28). Thirty-seven participants ($n = 244$; 13.2%) responded to the question regarding which IT services might be better provided in a decentralized manner (Q29). Fifty-four participants ($n = 244$; 19.3%) responded to the question regarding which IT services might be better provided in a centralized manner (Q30). Forty-three participants ($n = 244$; 15.4%) responded to the questions regarding which IT services might be outsourced with little impact to the NDSU campus (Q31).

In summary, 244 non-student employees responded to the online email survey of IT needs/requests. Participants were evenly distributed in gender. Most of the participants were age 30 to 59 ($n = 244$; 72.5%). The largest number of participants ($n = 244$; 23.4%) listed themselves as employees of the division of the provost/vice president for academic affairs. Most of the participants ($n = 244$; 59.0%) claimed to have an extended degree. High response rates are not uncommon within higher education environments where faculty and other academics are more likely to respond to population surveys due to their interest in the subject matter as well as the academic nature of their employment (Cook, Heath & Thompson, 2000; Dillman & Bowker, 2001).

The majority of participants ($n = 244$; 83.9%) did not indicate a liaison relationship with CITU. Although it is unclear why fewer non-student employees ($n = 244$; 31.1% or less) responded to each of the four open-ended questions of the survey regarding their IT

needs/requests (Q28-31); in hindsight, the placement of those questions as four of the last five questions in a 32-question survey may have resulted in participant response fatigue (Egleston, Miller & Meropol, 2011). Unfortunately, low participation is not the only consequence of participant response fatigue, which can also lead to incomplete or overly pessimistic or optimistic responses (Egleston, et al., 2011).

Procedures

Conducted under NDSU Institutional Review Board (IRB)-approved protocol #HSO8236 (Appendix A), the first study used an online campus survey of NDSU non-student employees in an effort to answer the first research question:

RQ1: In what ways are CITU's budget constraints recognizable in the IT needs/requests of NDSU non-student employees?

Perspective: 2011 and EDUCAUSE IT Issues Surveys. As an organization that exists to assist institutions of higher education with the innovative use of IT, the annual EDUCAUSE survey of IT issues is a benchmark survey for CITU (B. Neas, personal communication, December 11, 2008). When this project first began, the CITU vice president endorsed (see details in the next section) the 2008 EDUCAUSE IT issues survey results (Allison, DeBlois, & the 2008 EDUCAUSE Current Issues Committee, 2008), which placed "funding" as the third most important IT issue, behind "security" and "administrative systems/ERP systems." The 2008 survey also listed "funding" as the IT issue that took most of the chief information officer's (CIO's) time (Allison, et al., 2008). The 2011 EDUCAUSE survey reported "funding" as the top IT issue facing higher

education (Ingerman et al., 2011). In 2012, coded under a revised-methodology, “funding” was listed in seventh place in the EDUCAUSE survey; however, there were indications in the survey responses that “IT resources are becoming more decentralized ... [making] the IT funding big picture more difficult to see clearly” (Grajek et al., 2012, p. 49). Thus, the participant/observer’s decision was to use the 2011 survey for comparison purposes in this project and then tie those comparisons to the 2012 overall survey findings.

Perspective: CITU’s Vice President. Due to their status within organizations, top-level managers often serve as opinion leaders. During change processes, opinion leaders are influential within their organizational networks (Feder & Savastano, 2006; Keys, Thomsen & Smith, 2010; Sutanto, Kankanhalli, Tay, Raman & Tan, 2008). Previously two separate departments under two vice presidents, CITU was created in 2007, and a new vice president was hired to head the division (NDSU, 2012c). In forming the new division, NDSU’s president requested that the CITU vice president determine the best organization for campus-wide IT at NDSU (Appendix C). Additionally, the CITU vice president was charged with calculating the total cost of IT at NDSU (Appendix C). At that time, the participant/observer, recently hired into the division to assist the vice president, asked and received permission to advance the assignment as an IRB-approved research project (Appendix A).

The first step in the IRB approved protocol (Appendix A) was to interview the CITU vice president, as a NDSU opinion leader, in an effort to better understand CITU’s priorities (B. Neas, personal communication, December 11, 2008). During that interview,

the CITU vice president affirmed EDUCAUSE's 2008 top ten IT issues facing higher education (Allison, et al., 2008), indicating that "funding" was the number one issue facing CITU (B. Neas, personal communication, December 11, 2008). Additionally, during that same interview, the CITU vice president agreed to take the campus-wide survey ahead of other participants and to play an instrumental role in the survey process by agreeing to personally invite campus participation (B. Neas, personal communication, December 11, 2008). This interview with the CITU vice president garnered face validity for the survey instrument and provided another opportunity for the participant/observer to manage any dual-role bias regarding survey instrument.

Following the pilot survey (described in the "Procedures" section below), CITU's vice president was the first participant to complete the survey. In this way, prior to opening the survey for other NDSU non-student employee participants, the vice president's responses were captured in an effort to help record a CITU baseline response (L. Charlton-Gunderson, personal communication, August 11, 2009). Additionally, the CITU vice president's and the University of Nebraska – Lincoln (UNL) survey responses (outlined in next section) could later be compared to the responses of NDSU's non-student employees.

Perspective: UNL Survey. Oddly enough, another doctoral program requirement for the participant/observer proved to be an invaluable input source for this first study in forming the four main open-ended survey questions (Q28-31). Seeking to meet the doctoral requirement to present in a peer-reviewed arena, the participant/observer submitted a

proposal to present her initial IRB planning document for feedback at the 2009 EDUCAUSE Regional Conference (Ostrom-Blonigen & Neas, 2008). The proposal was accepted. However, the EDUCAUSE acceptance emails (Appendixes D and E) came with the unusual qualification: to combine the proposal (Ostrom-Blonigen & Neas, 2008) with a similar proposal prepared by a UNL employee (Roeber, 2008) and present a combined product at the March 2009 conference.

Approximately double NDSU's size and a Carnegie doctoral/research extensive institution; UNL, like NDSU, is a land grant institution with similar IT infrastructure needs and service requirements. Dr. Ronald Roeber, Associate Vice Chancellor for Facilities and Information Technology and Professor of Communication and Information Technology, UNL and the participant/observer worked throughout January and February 2009, meeting weekly via telephone conference calls, to merge the two presentations. In March 2009, Dr. Roeber and the participant/observer presented "Formulating Funding and Organizational Strategies at a Modern Research University" (Ostrom-Blonigen, Roeber, & Neas, 2009) at the EDUCAUSE regional conference in Chicago. In that presentation, the two examined how NDSU and UNL, two modern land grant research universities, were striving to formulate IT funding strategies (Ostrom-Blonigen, Roeber & Neas, 2009).

During those weekly telephone calls, the participant/observer learned that UNL recently had conducted a campus-wide survey of its IT stakeholders (University of Nebraska – Lincoln, 2009). While discussing the possibility of future partnerships, Dr. Roeber suggested that those opportunities might prove more fruitful if NDSU asked the

same questions in its survey of non-student employees. UNL's survey consisted of four basic questions: 1) identify information technology needs that UNL will require in the next five years to support the university's undergraduate and research priorities; 2) identify information technology services that might best be offered centrally; 3) suggest information technology services that might best be outsourced; and 4) suggest information technology services that are currently handled centrally, that might best be eliminated or handled at the unit level (University of Nebraska – Lincoln, 2009). Once complete, UNL's campus IT survey results were categorized into three themes: 1) user access to and experience with campus information technology services; 2) organization of campus information technology services and infrastructure; and 3) information technology services in direct support of the campus missions (University of Nebraska - Lincoln, 2009).

Creation of the Survey Questionnaire. In this first study, under IRB-approved protocol HS08236 (Appendix A), a survey was used to solicit NDSU non-student employees' IT needs/requests and to begin, at the request of NDSU's president (Appendix C), to collect cost data from decentralized IT units that were not part of CITU. All NDSU benefitted, non-student employees were invited, via NDSU's employee email list, by the CITU vice president (Appendix C) to participate in the online email survey. The NDSU Group Decision Center (GDC) administered the survey in a manner that concealed each participant's identity. Since 1998, the GDC has assisted NDSU personnel (students, faculty, and staff) and departments, as well as non-NDSU entities in providing electronic meetings and online surveys (NDSU, 2012a).

The first page of the online survey, which contained a standard IRB consent, described the first study and its goals, outlined the anticipated time the participant could expect to dedicate in responding to the survey (20 minutes), and thanked participants for their time. Participants were invited to indicate their consent by continuing the survey. The survey (Appendix B) contained 32 questions; the first four of which were demographical questions about age (Q1), gender (Q2), division of employment (Q3), and terminal degree (Q4). The next question in the survey (Q5), which asked the participant to indicate whether or not they were a student employee, was designed to identify student-employees, who might have mistakenly received the CITU vice president's invitation (Appendix B), and redirect them out of the survey. The page to which the student employees were redirected again described the protocol for the first study and requested that they refrain from participating in the survey.

The next set of three questions (Q6-Q8) solicited information regarding the participants' employment status at NDSU. Nineteen questions (Q9-Q27), based on NDSU benchmarking job categories in IT, were added to the survey at the request of the NDSU president (Appendix C) in an effort to determine the cost of IT tasks outside of the IT division. Participants were then requested to respond to four open-ended questions, which, framed to mirror the UNL questions, asked each participant the following:

- Q28) Given that NDSU's key missions are instruction, research, and outreach, please list and describe your top priority information technology services that NDSU requires now or should require within the next five years to effectively carry

out these missions (Example services: enhanced computational capacity, visualization or other specialized computing centers).

- Q29) Please list and describe the information technology services that are provided centrally now that you believe NDSU no longer needs to support campus-wide and could be provided more effectively by individual units needing the service.
- Q30) Please list and describe your top priorities for services that could be provided more efficiently and/or effectively if offered centrally by a campus-wide unit. Please also provide your criteria for effective service in each of these priority areas (Example service: servers purchased and maintained centrally that provide both Internet and local area network applications for campus units).
- Q31) Please list and describe those information technology services that are now provided either by campus-wide unit or by an individual unit that might be done more effectively if they were outsourced (Example outsourced service: Student Email). Please include your reasons for these choices.

All questions within the survey gave participants the option to not provide an answer.

Following their final responses, survey participants were thanked for completing the survey and the required IRB contact information was again listed for their review.

Pilot Survey. Once the survey questions were developed and loaded into the online survey software (NDSU, 2012a), the participant/observer invited the 14-member IT Council to take the survey prior to issuing a campus-wide invitation. Council members took the survey and reported some instrument concerns to the participant/observer. The IT

Council is an advisory group to the CITU vice president, comprised of five CITU employees and seven NDSU non-student employees who are not employed within CITU, and two student members. The IT Council meets approximately three times each year at the call of the CITU vice president to provide immediate campus feedback to CITU in the three primary areas of standards/infrastructure, research issues, and teaching and learning (NDSU, 2012b).

With the IT council's assistance, the participant/observer was able to identify some potentially problematic areas, as well as some inconsistent language, within the survey. In this manner, the problems and inconsistencies were corrected prior to releasing the survey to NDSU non-student employees. In this pilot survey, involving members of the IT Council, the participant/observer was also able to gather instrument validity for the survey, thus providing another way to manage participant/observer bias in survey instrument design.

As a result of the pilot survey, a final question (Q32) was added to determine whether a survey participant had an existing relationship to CITU as a member of one of its campus committees. Committees specifically identified in the survey were: IT council, IT council information technology advisory group (ITAG), IT tech group, telephone administrators, IT communication liaisons, and student technology fee advisory committee. Additionally, a write-in option was also made available within this question.

Measures

The participant/observer and two independent coders, both IRB-trained CITU employees with advanced degrees, categorized the survey responses to the four open-ended survey questions (Q28-31). Due to the IT nature of the survey responses, IRB-trained CITU employee coders were deemed appropriate for the coding task because of their expertise in interpreting stakeholder responses (S. W. King, Solomon, & Fernald, 2001). Prior to meeting as a group, all three (participant/observer and two independent coders) individually coded the survey responses. The participant/observer held four separate meetings, one for each question, and reached consensus with the independent coders on how to categorize the survey responses. Several major themes, agreed to by all three CITU coders for inter-coder reliability (Lombard, Snyder-Duch, & Bracken, 2002; Tinsley & Weiss, 1975, 2000), emerged from that 2009 work.

The main objective of the first study was to answer RQ1 by developing a better understanding of the IT needs/requests of NDSU's non-student employees (Appendix B: Q28-31). Once collected, the participant/observer reviewed the response data for indications of whether NDSU non-student employees were aware of CITU's budget constraints; specifically:

RQ1: In what ways are CITU's budget constraints recognizable in the IT needs/requests of NDSU non-student employees?

Additionally, information collected from NDSU's non-student employees regarding their "above-the-surface" IT needs/requests could be later used to assist CITU in estimating

future campus-wide IT provisioning demands and thereby plan “below-the-surface” IT upgrades and infrastructure. Finally, survey responses might also be reviewed, at a later date, to isolate differences between CITU and the campus’ decentralized IT units.

Comparison: EDUCAUSE IT Issues Surveys Categories. Given EDUCAUSE’s stature with the higher education community, its annual survey of the top ten IT issues within higher education (Allison, et al., 2008) was chosen as a comparison category (B. Neas, personal communication, December 11, 2008) for reviewing NDSU non-student employee responses to questions 28-31 in an effort to answer RQ1. The purpose of this comparison was to review how closely survey responses reflected the 2008 EDUCAUSE top ten IT issues facing higher education (Allison, et al., 2008). Although the 2008 EDUCAUSE top ten IT issues facing higher education initiative were endorsed by the CITU vice president at the time of her interview (B. Neas, personal communication, December 11, 2008); as described earlier, the participant/observer later chose to use the updated 2011 EDUCAUSE survey (Ingerman, et al., 2011) survey for comparison purposes. Previously identified in Chapter One, the ten IT issues facing higher education identified in 2011 were: 1) funding, 2) administrative/ERP/ information systems, 3) teaching and learning with technology, 4) security, 5) mobile technologies, 6) agility/adaptability/ responsiveness, 7) governance, portfolio/project management, 8) infrastructure/cyber-infrastructure, learning management systems, 9) disaster recovery/business continuity, and 10) strategic planning (Ingerman et al., 2011).

Comparison: CITU Vice President's Responses. This comparison category was to review how closely participant responses to the open-ended survey questions regarding the IT needs/requests of NDSU non-student employees (Appendix B: Q28-Q31) reflected the responses of CITU's vice president. Serving as an opinion leader within CITU, the vice president agreed to respond to the online survey before others were invited to participate so that her responses could be separately recorded. The CITU vice president's responses to the four open-ended questions (Q28-Q31) are included in Chapter Four.

Comparison: UNL Survey Categories. The next comparison category was to review how closely participant responses matched the IT provisioning categories identified in a 2009 UNL survey (UNL, 2009). As earlier identified, the four open-ended survey questions contained in the NDSU survey were based on similar survey questions asked at UNL (University of Nebraska-Lincoln, 2009). After conferring with CITU's vice president (B. Neas, personal communication, March 19, 2009), it was agreed to use those same questions in the NDSU survey (Appendix B: Q28-31).

The intentional use of these four open-ended questions (Appendix B: Q28-31) would also provide a basis for future collaboration between NDSU and UNL (Ostrom-Blonigen, Roeber, & Neas, 2009). After making this decision, a more extensive review of UNL's process leading up to the development of its 2009 survey revealed an early parallel recognition, in which UNL also identified the issue/problem of funding the technology of a research university, choosing to call their project: "determining what IT infrastructure and services were necessary to UNL's success" (University of Nebraska - Lincoln, 2009).

Unlike UNL's survey, in an effort to provide additional feedback about stakeholder groups, NDSU-specific demographical questions were added to the survey (Appendix B).

Study #2: Interviews of NDSU Non-student Employees

Interviewee Participants

A total of 21 NDSU non-student employees ($n = 28$; 75.0%) were interviewed in this second study. The first group of interviews included all three CITU department heads ($n=21$; 14.3%), two that were current employees and one who was a recently retired employee. Since the participant/observer was currently serving as an interim assistant vice president within the IT Division to fill a recent vacancy, the invitation to the retired department head was the result of a continued effort to control for the biases of the participant/observer because the retired department head was interviewed instead of the participant/observer. Using a snowball technique, seven more participants ($n=21$; 33.3%), identified by the CITU department heads, took part in the second group of interviews. Eleven more participants ($n = 21$; 52.4%) identified by the second round participants took part in the third round of interviews.

All interviewees ($n = 21$; 100%) indicated they had IT responsibilities within their departments. As previously indicated, three interviewees ($n = 21$; 14.3%), the CITU department heads, were employed by or recently retired from CITU. The remaining 18 interviewees ($n = 21$; 85.7%) were employed in NDSU departments, but not CITU. Eleven participants ($n = 21$; 52.4%) were female, and 10 participants ($n = 21$; 47.6%) were male.

Six of NDSU's organizational divisions ($n = 9$; 66.7%) were represented by the 21 interviewees.

Procedures

Conducted under NDSU IRB-approved protocol #HS12053 (Appendix F), 21 NDSU non-student employees were interviewed about their perceptions of CITU, in an effort to answer the second research question:

RQ2: In what ways are CITU's budget constraints recognizable in the perceptions of NDSU non-student employees?

Participant Identification. Anticipating some potential problems in recruiting interviewees due to the dual roles of the participant/observer, one professional and one scholarly (both personal) (Lindolf, 1995), the IRB protocol for the second study was aggressively designed for 39 potential interviews (Appendix F). Additionally, in an effort to minimize the bias created by the participant/observer's dual roles and to maximize the number of interviewee possibilities along normal interactional pathways (Biernacki & Waldorf, 1981; Coleman, 1958), the interviewee list began with three CITU department heads, two currently employed by CITU and one recently retired. From there, a snowball sampling technique (Biernacki & Waldorf, 1981; Coleman, 1958; Lindlof & Taylor, 2011) was used with the CITU department heads to identify additional potential interviewees.

A snowball sampling technique is "particularly applicable when the focus of the study is on a sensitive issue, possibly concerning a relatively private matter" (Biernacki & Waldorf, 1981, p. 141) or, as in this case, an issue regarding a matter previously kept

private. The technique is, therefore, a fitting partner to CPM. In the 2009 survey, all non-student employees were invited to participate in the online survey (Appendix C). Thus, it is possible that an employee solicited to participate in a second study interview may have responded to the first study's survey. Yin describes this common situation in single site studies: "in a case study about a single organization, the members of the organization would be the embedded units. These members also might have been the subjects of a formal survey" (2004, p. xvi). While further work with an embedded unit often provides richer findings and helps to direct future research, additional work with other organizations is also warranted (Yin, 2003, 2004).

This second study protocol (Appendix F) directed that, following their interview, each of the three CITU department heads would name three additional NDSU non-student employees, external to CITU, as potential interviewees. In this way, nine additional potential interviewees were to be identified. Then, following their interviews, those nine interviewees were to each name three additional NDSU non-student employees, also external to CITU, as potential interviewees. In this manner, 27 additional potential interviewees would be identified. Thus, thirty-nine potential interviewees were to emerge from this snowball sampling technique: the three CITU department heads, their nine potential interviewee choices, and the 27 potential interviewees named by those nine interviewees. In the end, as described below, a total of 28 invitations (71.8% of the protocol outlined number of 39) to participate in the second study were issued. These

invitations were accepted by 21 NDSU non-student employees ($n = 28$ invitations; 75.0% or $n = 39$ potential study interviewees; 53.8%).

Due to their encompassing roles in provisioning NDSU's IT products and services, the first three invitations (Appendix G), issued by the CITU vice president, to participate in the second study, went to the three CITU department heads, two of whom currently served in that role and one who had recently retired.

In a follow-up invitation telephone call from the participant/observer, all three (100%) department heads agreed to be interviewed. At the completion of their interviews, each of the three CITU department head interviewees were each asked to identify three additional NDSU non-student employees, external to CITU, to be invited to participate in the second study. As a result, nine additional potential interviewees, external to CITU, were named.

Once again, in accordance with the protocol of the second study (Appendix F), invitations to participate in the second study were issued by the CITU vice president (Appendix G) to the nine potential interviewees identified by the three CITU department heads. In a follow-up invitation telephone call from the participant/observer, six potential interviewees ($n = 9$; 66.7%) agreed to be interviewed (Interviewees 310, 320, 410, 420, 430, and 530), and three potential interviewees ($n = 9$; 33.3%) declined to be interviewed (Interviewees 330, 510, and 520). One of the potential interviewees ($n = 9$; 11.1%) who declined to be interviewed, cited the participant/observer's dual role as the reason for not participating in the second study (Interviewee 330, personal communication, October 6,

2011). The other two participants (Interviewees 510 and 520) did not respond to either of the participant/observer's two follow-up invitation telephone calls and were therefore also listed as "declining the invitation to participate" ($n = 2$; 22.2%).

Due to the exponential impact of nonparticipation from those three potential interviewees in the second round of interviews ($n = 9$; 33.3%), the participant/observer again contacted the CITU department heads who had identified those three interviewees and asked that additional potential interviewees be named. In an effort to prevent potential study failure, the participant/observer's action came at a critical decision point in the timeline of the second study when "the researcher must actively and deliberately develop and control the sample's initiation" (Biernacki & Waldorf, 1981, p. 143). As a result of the participant/observer's intervention, one additional potential interviewee was named (Interviewee 340) who agreed to participate in the second study; thus, seven interviewees ($n = 9$; 77.8%) participated in the second round of interviews.

Following their interviews, the seven interviewees were each asked to identify three additional NDSU employees, external to CITU, to be invited to participate in the second study. In this manner, 21 additional potential interviewees were named. Two of the second round interviewees (Interviewees 320 and 430) declined to name three additional potential interviewees ($n = 7$; 28.6%). As a result, only 15 ($n = 21$; 71.4%) additional potential interviewees, external to CITU, were named to participate in the third round of interviews.

Once again, in accordance with the protocol of the second study (Appendix F), invitations to participate in the second study were issued by the CITU vice president

(Appendix G) to the additional 15 potential interviewees identified by the second round interviewees. In a follow-up invitation telephone call from the participant/observer, 11 interviewees ($n = 15$; 73.3%) agreed to be interviewed (Interviewees 311, 312, 341, 343, 411, 412, 421, 422, 423, 531, and 533), and four potential interviewees ($n = 15$; 26.7%) declined to be interviewed (Interviewees 313, 342, 413, and 532). Of the four potential interviewees who declined to be interviewed as part of this round of interviews, one interviewee (#413) indicated, “I have nothing to contribute;” one interviewee (#342) indicated, “someone from my department has already participated in this process;” and two interviewees (#313 and #532) were unable to find time in their schedules to participate and were, therefore, also listed as “declining the invitation to participate.”

Interview Process. Most of the 21 interviews (three in the first round, seven in the second round, and 11 in the third round) were conducted at a neutral site in NDSU’s student union, which was reserved by the participant/observer and approved by each interviewee. With their approval, the interviews of the three CITU department heads were conducted at CITU. One interview (#530) was conducted in the interviewee’s office at the interviewee’s request. One interview (#533) was conducted over the phone at the interviewee’s request. Prior to beginning each interview, the participant/observer explained the interview process to each interviewee, which contained standard IRB consent language, described the first study and its goals, outlined the anticipated time the participant could expect to dedicate in responding to the survey (10 minutes), and thanked participants for their time. The full participant/observer’s interview script is contained in Appendix H.

Getting the best answers involves asking a question or a series of questions that allow the researcher to “create a rich dialogue with the evidence” (Yin, 2009, p. 69). With one interviewee, the second study’s open-ended research question of “please share with me your perception(s) regarding CITU” might prove sufficient in opening a rich dialogue, such that minimal follow-up by the participant/observer/interviewer is necessary. However, with another interviewee, the same question has the potential to result in an incomplete response, one that without additional prompting might render the interview void of any rich dialogue (Yin, 2009). Consequently, the research question of “please share with me your perception(s) regarding CITU” was, at times, followed up with “please provide an example that illustrates your perception(s).” Given this dynamic, it was helpful that the participant/observer/interviewer had the IT experiences necessary to “quickly review the evidence and continually ask . . . why events or facts appear[ed] as they [did]” (Yin, 2009, p. 69).

Once completed, the NDSU employee interviews were transcribed. The 21 interviews resulted in 1,306 transcribed lines. In addition, 28 pages of associated notes were taken by the participant/observer as a backup to the recorder. In one case, the recorder malfunctioned (Interview 320) and the participant/observer’s notes were transcribed. Due to the nature of the snowball nature of the selection process, two NDSU departments were represented twice. The functional responsibilities of one departmental set of interviewees (#340 and #341) were reported to be very similar; while the functional responsibilities of

the other set of departmental interviewees (#410 and #411) were reported to be very dissimilar.

Measures

The participant/observer and two independent coders reviewed and categorized the interviewees' transcripts. To begin, the participant/observer read each of the interviewees' transcripts searching for keywords that could substitute for the word "funding. The five keywords identified for "funding" were: "budget," "dollar," "fund," "money," and "resource." Once the keywords were identified, the participant/observer reviewed those sections of each interviewee's transcript to determine whether the interviewee was/was not discussing CITU's budget constraints.

Comparison of the Two Studies

In the comparison of the two studies, the participant/observer relied on the findings of those studies to address the third research question:

RQ3: In what ways are the responses of NDSU's non-student employees to RQ1 and RQ2 reflective of communication patterns studied using CPM?

"Triangulation is the display of multiple, refracted realities simultaneously" (Denzin & Lincoln, 2003, p. 8). The goal of triangulation is to seek convergence regarding data findings, most commonly through the combination of multiple methods (Lindlof & Taylor, 2002). Care must be taken not to rely too heavily on triangulation as a means to "validate" problem data (Denzin & Lincoln, 2003). For this project, noting the lack of NDSU non-

student employee responses regarding CITU's budget constraints, the participant/observer began Study #2 in an effort to gather additional, but independent, data through interviews.

For this third research question, two additional keywords were identified as reflective of the interviewee's relationship with CITU: "perception" and "satis," which is contained in words like "satisfied" or dissatisfied." The participant/observer then highlighted all seven keywords or word-parts ("budget," "dollar," "fund," "money," "resource," "perception" and "satis") in each transcript and independently coded the interview passages that contained those words for as reflective of the six CPM propositions and the four communication facets as described in Chapter Two. The independent coders were chosen for their expertise in IT (a CITU employee) and CPM (another researcher, a non-CITU employee, who is familiar with the theory). Due to the IT nature of the survey responses and the participant/observer's desire to limit coding bias, the IRB-trained CITU employee coder and the IRB-trained CPM non-employee coder were deemed appropriate for this coding task because of their combined expertise in interpreting stakeholder responses and applying CPM (S. W. King, Solomon, & Fernald, 2001). After highlighting the seven keywords the participant/observer gave the interviewees' transcripts to the independent coders.

The coders were asked to work together to code the transcript passages surrounding the keywords according to the six CPM propositions and the four communication facets described in Chapter Two. In an effort to further offset the participant/observer's bias, the two independent coders were asked to work collaboratively, without training from the

participant/observer, relying only on their own expertise in IT and CPM to reach coding consensus before meeting again with the participant/observer. By not taking part in the coding agreement between the two independent coders, the participant/observer believed that inter-coder reliability (Lombard, Snyder-Duch, & Bracken, 2002; Tinsley & Weiss, 1975, 2000) between IT interpretations (by the CITU-employee-coder who did not have CPM-experience) and CPM interpretations (by the non-CITU-employee coder with CPM-experience and no IT-work-related experience), would be more balanced.

Once the two independent coders reached a consensus, the participant/observer and the CPM-coder met to discuss the findings of the two independent coders. In an effort to further reduce the CITU-related bias of this study, the IT-coder was not present for this meeting. The agreed upon findings of the independent coders were then compared against the findings of the participant/observer. The CPM-coder and the participant/observer then worked together to resolve any coding conflicts and reach coder-agreement (Lombard, Snyder-Duch, & Bracken, 2002; Tinsley & Weiss, 1975, 2000).

CPM Propositions

As described in Chapter Two, the six propositions of CPM (Child, et al., 2009) are: 1) ownership, 2) control, 3) rules, 4) co-ownership, 5) negotiated rules, and 6) boundary turbulence. These propositions were identified by the participant/observer and the independent coders in their separate reviews of the interviewee transcripts. The transcripts were first reviewed independently by the participant/observer who highlighted six keywords (“budget,” “fund,” “dollar,” “resource,” “perception,” and “satis”) within the

context of each interviewee transcript. After the two independent coders reached consensus on the propositions, in a continued effort to reduce study bias, the participant/observer met with only the CPM-coder and the two of them reviewed the CPM proposition coding differences for the purpose of reaching an overall coding consensus.

CPM Facets

As also described in Chapter Two, four emergent facets of communication found both within the CPM and organizational communication literature were also used in the second study: 1) communication disclosure and nondisclosure motivations; 2) relationship satisfaction or dissatisfaction; 3) topic avoidance; and 4) communication turbulence. These facets were identified by the participant/observer and the independent coders in their separate reviews of the interviewee transcripts. The transcripts were first reviewed independently by the participant/observer who highlighted six keywords (“budget,” “fund,” “dollar,” “resource,” “perception,” and “satis”) within the context of each interviewee transcript. After the two independent coders reached consensus on the facets, in a continued effort to reduce study bias, the participant/observer met with the CPM-coder and the two of them reviewed the communication facet coding differences for the purpose of reaching an overall coding consensus.

Addressing the Project Delimitations

To repeat, the two project delimitations listed in Chapter One included: single campus focus and the dual role of the participant/observer. Organizational case study literature provides many examples of the merit of single site studies (Yin, 2009). In this

project, CITU was believed to be representative of an average (Yin, 2009) centralized IT unit within higher education. Additionally, as was one of the goals of this project, single site studies can provide more in-depth examples and therefore might provide richer of studied details. As described in the “understand the fit” translational pathway in Chapter Five, the goal of this project was to understand CPM’s fit within the organizational context of CITU.

Understanding that one, single-site study cannot alter CPM’s current place within interpersonal communication, CPM scholars should continue to conduct follow-up studies using CPM in other organizational settings to determine whether similar results can be documented. Future studies could include other potentially private organizational subjects (e.g., forecasts, intellectual property, research and development) across other organizations, both public and private, within and outside of higher education. Additionally, future projects should continue to examine the differences in communication boundary permeability associated with open records laws to decide whether CPM can explain those similarities.

As the participant/observer, I also believe that my dual roles contributed to this project in unique ways. My keen desire to learn more about the role of a central IT unit within a higher-education campus enabled me to apply my analytical skills to this project. While I acknowledged that I have biases related to this subject matter, I also entered into this study using a PAR approach and took the following steps to minimize those biases so that:

- the maximum number of interviewee possibilities along normal interactional pathways (Biernacki & Waldorf, 1981; Coleman, 1958) were discovered, a snowball technique was used to identify the participants in Study #2 and
- IT was not overly represented in the consensus findings in Study #2, the IT-coder was not present at the coding meeting between participant/observer and the CPM-coder

As Yin (2009) suggests whenever bias exists, the researcher should work to categorize the information into initial findings, which should then be shared with others who were familiar enough with the work (IT-coders in the Study #1 and #1) or the theory (CPM-coder in Study #2) to offer different reasons for the findings. Using this approach for coding, Yin believes that, “if the quest for contrary findings can produce documentable rebuttals, the likelihood of bias will have been reduced” (2009, p. 72). To help control for my biases as both researcher and participant/observer in this project, as already documented in this chapter, I selected two different sets of independent coders for the two studies.

In PAR studies, the participant/observer becomes a participant researcher; a “tool for facilitating change, rather than the owner, director and expert in the research project” (Walter, 2009, p. 2). Thus, PAR studies (Figure 5) have no leader, but instead rely on the “knowledges and knowledge systems of the community of research interest” (Walter, 2009, p. 2). This study functions as the “initial planning” step in a repetitive PAR process that may be repeated by CITU or other IT stakeholders on the NDSU campus until such time as

the IT problem or issue that is under consideration believed to be resolved by the collective (McIntyre, 2008; Walter, 2009).

Thus, ever mindful of this conflict, using NDSU as the project site, I moved forward as the participant/observer, motivated by the possibility that this work, or something within the “collection, collation, classification and correlation of (these) observations and data” (Neumann, 1993, p. 104) might give CITU, or other IT units like it, something more to consider as they all face the unique funding and technology challenges of today’s higher-education environment.

Summary

This chapter outlined the methods used in the two independent studies of this project. Survey and interviewee participant characteristics were described in the first section of each study. Additionally, procedures and measures were documented for both studies. This chapter also addressed the study delimitations identified in Chapter One.

In Study #1, a survey questionnaire was created, tested in a pilot study and administered to the entire NDSU non-student employee population. Various inputs from other sources were also introduced and independently measured against the survey responses to determine how “funding” was reflected in those responses. The purpose of Study #1 was to answer RQ#1 and to set a stage for the response to RQ#3.

In Study #2, a snowball interview process beginning with the three CITU department heads was used to identify how “funding” was reflected in interviewees’ perceptions of CITU. In this study, various keywords believed to be synonymous with the

word “funding” were selected and located within each study transcript. The first purpose of Study #2 was to answer RQ#2 and to set a stage for the response to RQ#3. The second purpose of Study #2 was to answer RQ3 to examine how CPM was reflected in the interviewees’ responses. The next chapter outlines the findings from both studies.

CHAPTER FOUR. FINDINGS

"The qualitative researcher usually begins a study out of a personal and scholarly fascination with a phenomenon, and continues to respect its integrity while carrying out field activities. The researcher turns his or her attention to the forms and functions of the phenomenon as it operates in natural context" (Lindlof, 1995, p. 22)

In this chapter, the data has been examined and categorized in an effort to decide whether the Study #1 surveys of or the Study #2 interviews with NDSU's non-student employees showed user-recognition of CITU's budget constraints. Additionally, efforts were made to determine whether communication boundaries surrounding CITU's budget could be producing negative perceptions of CITU. Finally, participant responses were compared to the project measures identified for both studies in Chapter Three. The categories were then reviewed for the presence of the six CPM propositions of : 1) ownership, 2) control, 3) rules, 4) co-ownership, 5) negotiated rules, and 6) boundary turbulence and the four facets of communication that emerged in both the organizational communication and the CPM literature, as outlined in Chapter Two: 1) communication disclosure and nondisclosure motivations; 2) relationship satisfaction or dissatisfaction; 3) topic avoidance; and 4) communication turbulence.

As previously described, this project involved two separate studies: Study #1 - a NDSU campus-wide survey of 244 non-student employees (Appendix B); and Study #2 - interviews of 21 NDSU non-student employees in an effort to answer the project research questions. Both methods were undertaken in an effort to provide more than one input

source from NDSU non-student employees regarding whether their listed IT needs/requests or their perceptions of CITU showed user-recognition of CITU's budget constraints. In this chapter, the survey and interview responses are discussed and the information obtained in those two studies is combined in an effort to determine whether CITU's budget constraints were recognizable in the responses of NDSU non-student employees (RQ1 and RQ2) and whether the four communication facets recognized in both the six CPM propositions and the organizational communication literature could also be found in the responses of NDSU non-student employees (RQ3).

Study #1: Survey of NDSU Non-student Employees

There were a total of 207 responses ($n = 976$ (four questions for each of the 244 survey participants); 21.2%) to the final four questions of the 27-question online email survey. Questions 1-26 were each demographical questions for which the participants responses have already been outlined in Chapter Three. As previously mentioned, some participants may have become fatigued with the survey due to answering 27 multiple-choice questions prior to the four open-ended questions (Q28-31). The responses to each of the open-ended questions are outlined below.

Summary Findings of 2009 Survey Participant Responses to Question 28

Q28: Given that NDSU's key missions are instruction, research, and outreach, please list and describe your top priority information technology services that NDSU requires now or should require within the next five years to effectively carry out these

missions (Example services: enhanced computational capacity, visualization or other specialized computing centers).

Seventy-six (31.1%) of the 244 participants responded to question 28. However, some participants responded with more than one IT priority. As a result, five main categories emerged from 125 unique responses. The participant/observer and the two IRB trained independent coders, both of whom were also CITU employees, categorized the responses as follows: infrastructure ($n = 125$; 29.6%), applications ($n = 125$; 27.2%), instructional services ($n = 125$; 20.8%), training/support ($n = 125$; 12.8%), and desktop services/software ($n = 125$; 9.6%).

Bandwidth ($n = 37$; 24.3%) was the top IT priority in the infrastructure category. Advanced research computing support ($n = 34$; 38.2%) was the top IT priority in the applications category. Best practices/appropriate use of technology ($n = 26$; 19.2%) was the top IT priority in the instructional services category. Web services ($n = 16$; 18.8%) and support ($n = 16$; 18.8%) were tied as the top IT priorities in the training/support category. Basic IT service ($n = 12$; 58.3%) was the top IT priority in the desktop services/software category.

In further conversation, the three coders agreed to create two additional categories for this question: “education/communication needs” and “areas of concern.” Twelve of the previously coded responses were listed again in the “education/communication needs” category; the largest number of responses ($n = 125$; 9.6%) expressed a need/request the CITU work to better articulate its core services. Similarly, seven previously coded

responses were listed again in an “areas of concern” category; the largest number of responses ($n = 125$; 5.6%) demonstrated an increased need for IT security.

Table 2. Summary of Q28: Most Frequent Response by Category

Infrastructure: 37; n = 125 (29.6%) #1 - Bandwidth (24.3%)	Applications 34; n = 125 (27.2%) #1 -Advanced research computing support (38.2%)	Instructional Services 26; n = 125 (20.8%) #1 - Best practices / appropriate use of technology (19.2%)	Training / Support 16; n = 125 (12.8%) #1 - Web services (18.8%) and support (18.8%)	Desktop Services / Software 12; n = 125 (9.6%) #1 - Basic IT service (58.3%)
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Summary Findings of 2009 Survey Participant Responses to Question 29

Q29: Please list and describe the information technology services that are provided centrally now that you believe NDSU no longer needs to support campus-wide and could be provided more effectively by individual units needing the service.

Thirty-six (14.8%) of the 244 participants responded to question 29. Thirteen participants ($n = 36$; 36.1%) indicated that centralization was preferred. Those participants cited several reasons for favoring centralization including: email services ($n = 36$; 5.6%), IT security concerns ($n = 36$; 5.6%), concerns related to clusters/computer labs ($n = 36$; 5.6%), and limited distributed IT operating budgets ($n = 36$; 2.8%). Only two participants ($n = 36$; 5.6%) specifically favored decentralization, both of whom indicated that clusters/computer labs should be decentralized at the departmental level. The responses of the remaining 21 participants ($n = 36$; 58.3%) could not be coded under the question.

Responses that could not be coded included: “none” ($n = 36$; 25.0%), “the services that are in place work very well in my department,” “our services are provided internally,” “ITS should do more, not less,” and a complaint about slow response times.

In further conversation, the three coders agreed to create two additional categories for this question: “concerns/complaints” and “educational needs.” Two very specific concerns, included in the “could not be coded under the question” category were listed in a “concerns/complaints” category. Six responses ($n = 36$; 16.7%), also previously included in the “could not be coded under the question” category, were again listed in the “educational needs” category; the largest number of responses ($n = 36$; 8.3%) recorded a need to know more about CITU’s IT funding.

Table 3. Summary of Q29: Most Frequent Response by Category

<p>Preferred overall centralization of IT services 13; n = 36 (36.1%) #1 - Email (5.6%); IT security concerns (5.6%); and cluster concerns (5.6%)</p>	<p>Preferred overall decentralization of IT services 2; n = 36 (5.6%) #1 – Cluster concerns (5.6%)</p>	<p>Could not be coded under the question 21; n = 36 (58.3%)</p>
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Summary Findings of 2009 Survey Participant Responses to Question 30

Q30: Please list and describe your top priorities for services that could be provided more efficiently and/or effectively if offered centrally by a campus-wide unit. Please also provide your criteria for effective service in each of these priority areas (Example service: servers purchased and maintained centrally that provide both Internet and local area network applications for campus units).

Fifty-five (22.5%) of the 244 participants responded to question 30. However, eight participants ($n = 55$; 14.5%) responded “none” and were not used in the coding. From the remaining 47 participants, 52 unique responses emerged in the seven main categories of core services ($n = 52$; 23.0%), research support ($n = 52$; 21.2%), standards ($n = 52$; 19.2%), connectivity ($n = 52$; 13.5%), instructional support services ($n = 52$; 11.5%), IT support ($n = 52$; 5.8%), and information management ($n = 52$; 5.8%).

Email ($n = 12$; 50.0%) was the top response in the core services category. Server services ($n = 11$; 36.4%) was the top response in the research support category. Purchasing standards for hardware ($n = 10$; 40.0%) was the top response in the standards category. Networking ($n = 7$; 57.1%) was the top response in the connectivity category. All responses in the instructional support services category were single instances. Help Desk ($n = 3$; 66.7%) was the top response in the IT support category. All responses in the information management category were single instances.

In further conversation, the three coders agreed to create two additional categories for this question: “educational needs” and “out of survey bounds.” One, previously coded, very specific concern was coded in the “educational needs” category. Nine responses were again coded in the “out of survey bounds” category; the largest number of responses ($n = 52$; 17.3%) called for several smaller CITU units.

Table 4. Summary of Q30: Most Frequent Response by Category

Core services 12; n = 52 (23.0%) #1 – Email (50.0%)	Research support 11; n = 52 (21.2%) #1 – Server services (36.4%)	Standards 10; n = 52 (19.2%) #1 – Purchasing standards (40.0%)	Connectivity 7; n = 52 (13.5%) #1 – Networking (57.1%)	Instructional support services 6; n = 52 (11.5%) Six separate responses	IT support 3; n = 52 (5.8%) #1 – Help Desk	Information management 3; n = 52 (5.8%) Three separate responses
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Summary Findings of 2009 Survey Participant Responses to Question 31

Q31: *Please list and describe those information technology services that are now provided either by campus-wide unit or by an individual unit that might be done more effectively if they were outsourced (Example outsourced service: Student Email). Please include your reasons for these choices.*

Forty-two (17.2%) of the 244 participants responded to question 31 with forty-nine answers. Twenty-five participants ($n = 49$; 51.0%) responded “none” or indicated that no changes are recommended. From the remaining 29 participants, 36 unique responses emerged in five main categories of core services ($n = 49$; 28.6%), web and server ($n = 49$; 8.2%), support ($n = 49$; 6.1%), materials ($n = 49$; 4.1%) and specialized applications ($n = 49$; 2.1%).

Email was again the top response (85.7%) in the core services category. All responses in the web and server, support material and specialized applications category responses were all single instances.

In further conversation, the participant/observer and independent coders agreed to create two additional categories of “educational needs” and “out of survey bounds” for

later attention. IT funding was the specific concern coded in the “educational needs” category. Computer purchasing was coded in the “out of survey bounds” category.

Table 5. Summary of Q31: Most Frequent Response by Category

<p>Core services 14; n = 49 (28.6%) #1 – Email (85.7%)</p>	<p>Web and server 4; n = 49 (8.2%) Four separate responses</p>	<p>Support 3; n = 49 (6.1%) Three separate responses</p>	<p>Materials 2; n = 49 (4.1%) Two separate responses</p>	<p>Specialized applications 1; n = 49 (2.1%)</p>	<p>None 25; n = 49 (51.0%)</p>
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Overall Summary Findings of 2009 Survey Participant Responses (Q28-31)

Overall, the NDSU non-student employees, who responded to the survey, said that advanced research computing support (particularly for visualization and simulation), bandwidth, best practices for and appropriate use of instructional design, data storage for streaming media and research data, cloud computing, virtualization, and unified email and calendar services should be the top IT service considerations for CITU during the next 5 years. IT services that most NDSU employees said should be decentralized included email service and website development. Conversely, IT services that most NDSU employees thought should be centralized included email service, hardware purchasing standards, and servers for research support. IT services that most NDSU employees believed should be outsourced were again email and calendar services (something that has since been done) and web-site development. In further conversations, the coders also noted a need for CITU to articulate its core services was also apparent in the survey responses.

Comparison of Survey Participant Responses to 2011 EDUCAUSE IT Survey

Table 6 provides a comparison of EDUCAUSE IT issues (Ingerman et al., 2011) and the total 262 survey participant responses to questions 28-31 (Q1: 125, Q2: 36, Q3: 52, and Q4: 49); 69 ($n = 262$; 26.3%) of which could be coded against the EDUCAUSE survey. “Funding” was not an issue identified by any of the survey participants in question 28, which asked participants to name the top IT issues facing IT at NDSU. Although “funding” was mentioned in 14 unique responses in the remaining questions (Q29-31), the responses referenced the responder’s own departmental budget constraints and not CITU’s.

As shown in Table 6, the EDUCAUSE IT issues survey category most represented in the NDSU participants’ responses was “agility/adaptability/ responsiveness,” with 15 unique responses. “Teaching and learning with technology” and “infrastructure/cyber-infrastructure; learning management systems” were next with 13 and 12 unique responses respectively. The only other EDUCAUSE IT issues survey category represented in double-digit responses was “security,” with 10 unique responses. The EDUCAUSE IT issues survey category of “disaster recovery/business continuity” had two unique responses; whereas the categories of “administrative/ERP/information systems,” “mobile technologies,” and “strategic planning” each had one unique response. The only EDUCAUSE survey IT issues category that was not represented in the participants’ responses was “governance, portfolio/ projects management.”

Comparison of Survey Participant Responses to CITU Vice President's Responses

The CITU vice president believed that “funding for CITU” was a top IT issue facing NDSU; stating that NDSU needed to “acquire resources to adequately support these IT efforts” (L. Charlton-Gunderson, personal communication, August 11, 2009). As shown in Table 6, “funding” was not listed as a general concern of the campus’ non-student employees in their responses to question 28. “Decentralized IT funding” was, however, mentioned in the survey responses to questions 29-31. Thus, the CITU vice president’s response to question 28 that “funding” is a top-level priority for the NDSU campus is consistent with the top IT issue identified the 2011 EDUCAUSE survey (Ingerman et al., 2011). However, the survey responses show that for the NDSU campus stakeholders, centralized funding is not a priority.

In her response to question 29, the CITU vice president said discipline-specific IT applications could perhaps be better provided in a decentralized manner (L. Charlton-Gunderson, personal communication, August 11, 2009). Participant response numbers to this question were low (5.6%) when compared to the CITU vice president’s response; thus, there appears to be a response communication disconnect between CITU and the survey participants regarding which IT services could be decentralized.

Table 6. Comparison of Survey Participant Responses to EDUCAUSE IT Issues

NDSU Participant Responses	2011 EDUCAUSE IT Issue Priority ranking
<u>Agility/adaptability/ responsiveness</u> (15 (n = 262; 5.7%)) Question 28: 5 (n = 125; 4.0%) Question 29: 3 (n = 17; 17.6%) Question 30: 2 (n = 52; 3.8%) Question 31: 5 (n = 49; 4.1%)	#6
<u>Funding at the DECENTRALIZED level</u> (14 (n = 262; 5.3%)) Question 28: 0 (n = 125; 0.0%) Question 29: 3 (n = 17; 17.6%) Question 30: 5 (n = 52; 9.6%) Question 31: 6 (n = 49; 12.2%)	#1
<u>Teaching and learning with technology</u> (13 (n = 262; 5.0%)) Question 28: 9 (n = 125; 7.2%) Question 29: 0 (n = 17; 0.0%) Question 30: 3 (n = 52; 5.8%) Question 31: 1 (n = 49; 2.1%)	#3
<u>Infrastructure/cyber-infrastructure</u> <u>[e.g.: Internet2 (I2)];</u> <u>learning management systems</u> (12 (n = 262; 4.6%)) Question 28: 9 (n = 125; 7.2%) Question 29: 0 (n = 17; 0.0%) Question 30: 3 (n = 52; 5.8%) Question 31: 0 (n = 49; 0.0%)	#8
<u>Security</u> (10 (n = 262; 3.8%)) Question 28: 3 (n = 125; 2.4%) Question 29: 2 (n = 17; 11.8%) Question 30: 2 (n = 52; 3.8%) Question 31: 3 (n = 49; 6.1%)	#4

(continued)

Table 6. Comparison of Survey Participant Responses to EDUCAUSE IT Issues

NDSU Participant Responses	2011 EDUCAUSE IT Issue Priority ranking
<u>Disaster recovery/business continuity</u> (2 (n = 262; 0.8%)) Question 28: 0 (n = 125; 0.0%) Question 29: 0 (n = 17; 0.0%) Question 30: 1 (n = 52; 1.9%) Question 31: 1 (n = 49; 2.1%)	#9
<u>Administrative/ERP /information systems [e.g.; at NDSU: ConnectND or PeopleSoft]</u> (1 (n = 262; 0.4%)) Question 28: 0 (n = 125; 0.0%) Question 29: 0 (n = 17; 0.0%) Question 30: 1 (n = 52; 1.9%) Question 31: 0 (n = 49; 0.0%)	#2
<u>Mobile technologies</u> (1 (n = 262; 0.4%)) Question 28: 0 (n = 125; 0.0%) Question 29: 0 (n = 17; 0.0%) Question 30: 1 (n = 52; 1.9%) Question 31: 0 (n = 49; 0.0%)	#5
<u>Strategic planning</u> (1 (n = 262; 0.4%)) Question 28: 0 (n = 125; 0.0%) Question 29: 0 (n = 17; 0.0%) Question 30: 1 (n = 52; 1.92%) Question 31: 0 (n = 49; 0.0%)	#10
<u>Governance, portfolio/project management</u> (0 (n = 262; 0.0%)) Question 28: 0 (n = 125; 0.0%) Question 29: 0 (n = 17; 0.0%) Question 30: 0 (n = 52; 0.0%) Question 31: 0 (n = 36; 0.0%)	#7

Additionally, the CITU vice president believed that “applications that meet the broader community’s needs, such as email and calendaring,” would best be provided centrally (L. Charlton-Gunderson, personal communication, August 11, 2009). Six (n = 52; 11.5%) non-student employee responses to question 30 also advocated centralized email.

Ironically, just over a year later, in a large-scale centralization move, the N. D. university system mandated one email system for all employee and student applications for all 11 of its campuses (NDSU, 2010c). Thus, the CITU vice president and the N. D. university system appeared to be in agreement regarding the centralization of email and calendaring, even though the NDSU campus may not have been. Ironically, in making its decision to centralize the employee and student email applications of all 11 campuses (NDSU, 2010c), the N. D. university system also made the decision to outsource the service, which is contrary to the CITU's vice president's belief regarding outsourcing of IT services.

Finally, in her response to question 31, in direct disagreement to what the N. D. university system did with email and calendaring, the CITU vice president said “not applicable” or no IT applications should be outsourced (L. Charlton-Gunderson, personal communication, August 11, 2009). The CITU vice president later, as part of Study #2, discussed her response to the question in her interview with the participant/observer; during which time, she expressed concerns about cloud computing and its current position at the “peak of inflated expectations” on the Gartner Hype Cycle (B. Neas, personal communication, December 11, 2008) – also see Figure 3. Twenty-five non-student employees ($n = 49$; 51.0%) responded in agreement with the CITU vice president to question 31 by indicating that nothing should be outsourced. However, twelve participants ($n = 49$; 24.5%) agreed that email and calendaring services should be outsourced. Thus, there appears to be some agreement on this issue among NDSU survey participants and the N. D. university system.

Comparison of Survey Participant Responses to UNL Survey Categories

Although further collaboration has yet to occur, on the surface, interviewee responses to the 2009 NDSU user survey appear to parallel UNL users' three areas of concern: 1) user access to and experience with campus information technology services; 2) organization of campus information technology services and infrastructure; and 3) information technology services in direct support of the campus missions (University of Nebraska - Lincoln, 2009). The participant/observer and the two coders identified 13 unique categories from interviewee responses to the four open-ended questions of the 2009 NDSU survey. Table 7 shows the UNL areas of concern in the left-hand column and the emergent NDSU participant response categories to the four open-ended questions in the right-hand column.

As shown in Table 7, some categories appear in more than one area of concern; in these instances, unique participant responses were coded to different areas of concern. Of special note, four categories: "desktop services/software," "IT support," "specialized applications," and "training/support" appeared in all three areas of concern; thus, user responses related to these types of IT needs/requests are prevalent throughout the survey.

Table 7. Comparison of Survey Participant Responses to UNL Survey Categories

UNL Survey Areas of Concern	NDSU Participant Responses to Questions 28 – 31
User access to and experience with campus information technology services	<p>Responses referencing the following IT products/services were placed in this UNL category:</p> <ul style="list-style-type: none"> ○ Applications (Category #1 - Q28) ○ Core services (Category #4 - Q30, Q31) ○ Desktop services/software (Category #5 - Q28, Q29) ○ IT support (Category #9 - Q30 and Q31) ○ Materials (Category #10 - Q31) ○ Specialized applications (Category #11 - Q31) ○ Training/support (Category #12 - Q28)
Organization of campus information technology services and infrastructure	<p>Responses referencing the following IT products/services were placed in this UNL category:</p> <ul style="list-style-type: none"> ○ Connectivity (Category #3 - Q31) ○ Desktop services/software (Category #5 - Q28, Q29) ○ Enterprise services (Category #6 - Q29) ○ Infrastructure (Category #7 - Q28) ○ IT support (Category #9 - Q30 and Q31) ○ Specialized applications (Category #11 - Q31) ○ Training/support (Category #12 - Q28) ○ Web and server (Category #13 - Q31)
Information technology services in direct support of the campus missions	<p>Responses referencing the following IT products/services were placed in this UNL category:</p> <ul style="list-style-type: none"> ○ Applications (Category #1 - Q28) ○ Clusters (Category #2 - Q29) ○ Core services (Category #4 - Q30, Q31) ○ Instructional services (Category #8 - Q28, Q29) ○ IT support (Category #9 - Q30 and Q31) ○ Materials (Category #10 - Q31) ○ Specialized applications (Category #11 - Q31) ○ Training/support (Category #12 - Q28)

Summary of Study #1 Findings

In this first study, survey participants who recognized NDSU's budget constraints recognized them as manifested within their own departments, but not CITU's; indeed, in at least a couple of responses, it appeared that the campus participant was unaware of CITU's budget constraints:

- *“How are individual units supposed to fund IT? he [The] operating budgets of departments haven't increased in 15 years” (Participant #80392).*
- *“Hmmm.... Does this mean that ITS [CITU] is poising itself to dump part of its campus computing responsibility on the departments? This seems neither reasonable nor prudent, given their already-stretched (i.e., inadequate) operating budgets” (Participant #81049).*

In addition, one participant stated it was CITU's responsibility to make IT decisions on behalf of the campus:

- *“The need for services is generated by the instructional and research functions of the university; the methods for best providing them are what I thought the IT unit [CITU] was supposed to do. Asking us to examine the trade-offs between out-sourcing and on-campus service provision is an abdication of your responsibility. If the IT unit [CITU] has to ask such a fundamental question, the usefulness of that IT unit [CITU] is immediately called into querrstion [question]” (Participant #80438).*

The NDSU CITU vice president's response to question 28 indicates her endorsement for the 2011 EDUCAUSE #1 IT issue of "funding" (Ingemann, et al., 2011); however, the responses from the NDSU campus do not mirror that concern. Yet, when the survey responses at NDSU and UNL are compared, the resulting categories are essentially the same. Thus, there appears to be a another communication disconnect between the perceived IT needs identified by campus stakeholders at both NDSU and UNL and the IT "funding" issue identified in the 2011 EDUCAUSE survey and by the CITU vice president.

Study #2: Interviews of NDSU Non-student Employees

CITU Department Head Interviews

The interviews with CITU department heads sought to identify CITU's perceptions regarding how CITU's leadership believed CITU was viewed by the NDSU campus community. In the first phase of this second study, the participant/observer read each of the interviewee transcripts and highlighted words that could substitute for "funding." The participant/observer found the following keywords in the transcripts: "budget," "dollar," "fund," "money," and "resource."

Outlined in Table 8 is the number of times the keywords found were counted in the interviewees' transcripts. All ten instances in which CITU's budget constraints were referenced came from an interview transcript of one of the three CITU department heads.

Table 8. Instances in which CITU Budget Constraints were Mentioned in Interviewees' Transcripts

Keyword	# of times found in transcripts	# of times reflective of CITU's budget constraints	% of times reflective of CITU's budget constraints
Budget	5	1	20.0%
Dollar	1	0	0.0%
Fund	28	9	32.1%
Money	15	0	0.0%
Resource	<u>8</u>	<u>0</u>	0.0%
Totals	57	10	17.5%

In the second phase of this second study, as previously described, the two independent coders were chosen for their experience: 1) as a CITU employee and 2) as an independent researcher familiar with the CPM theory. Following a coding session of the two independent coders, the participant/observer and the CPM-coder met to resolve any differences in the coding of the participant/observer and the two independent coders. In a further effort to reduce the IT-related bias in this study, the IT-coder was not present. Table 9 reflects the study findings by the participant/observer and the independent coders that illustrate the agreed to CPM propositions and communication facets in the transcripts of the CITU department heads.

The participant/observer and the two independent coders agree that three of the six CPM propositions: control, co-ownership, and boundary turbulence were found in the interview transcripts of the CITU department heads.

Table 9. Coding Agreement Index for CPM Propositions and Communication Facets Found in the CITU Department Heads' Interview Transcripts

CPM Proposition	Participant/ Observer	Independent Coders	Consensus between the two
Ownership			
Control	Yes (#401)	Yes (#401)	#401: Agreed
Rules			
Co-ownership	Yes (#301)	No (#301)	#301: Yes, the CPM-coder agreed that their coding as “cooperation” was co-ownership
	Yes (#401)	Yes (#401)	#401: Agreed
	Yes (#501)	No (#501)	#501: Yes, the CPM-coder agreed that the passage: “campus should know” was about co-ownership and not a non-disclosure motivation
Negotiated rules			
Boundary turbulence	Yes (#401)	No (#401)	#401: No, the participant/observer agreed that the passage coded as boundary turbulence reflected relationship dissatisfaction
	Yes (#501)	Yes (#501)	#501: Agreed
Disclosure / non-disclosure motivations	Yes (#301)	No (#301)	#301: Yes, the CPM-coder agreed that “perceived complexity in delivering the budget message” could be a non-disclosure motivation for CITU
	No (#501)	Yes (#501)	#501: No, the CPM-coder agreed that the passage: “campus should know” was about co-ownership and not a non-disclosure motivation

(continued)

Table 9. Coding Agreement Index for CPM Propositions and Communication Facets Found in the CITU Department Heads' Interview Transcripts (continued)

Relationship satisfaction / dissatisfaction	Yes (#301)	Yes (#301)	#301: Agreed
	No (#401)	Yes (#401)	#401: Yes, the participant/observer agreed that the passage coded as boundary turbulence reflected relationship dissatisfaction
	Yes (#501)	Yes (#501)	#501: Agreed
Topic avoidance			
Communication turbulence	Yes (#401)	No (#401)	#401: No, the participant/observer agreed that the passage coded as boundary turbulence reflected relationship dissatisfaction
	Yes (#501)	Yes (#501)	#501: Agreed

Ownership Proposition. The participant/observer and the two independent coders agree that the CPM propositions of ownership, rules, and negotiated rules were not reflected in the interviewee transcripts of the CITU department heads.

Control Proposition. The participant/observer and the two independent coders agree that the CPM proposition of control was reflected in the interviewee transcript of one of the three department heads ($n = 3$: 33.3%), who (Interviewee #401) indicated that CITU's communication message to the campus should be consistent regardless of the impact of external forces on CITU's budget.

Rules Proposition. The participant/observer and the two independent coders agree that the CPM propositions of ownership, rules, and negotiated rules were not reflected in the interviewee transcripts of the CITU department heads.

Co-ownership Proposition. The participant/observer and the two independent coders also agree that the CPM proposition of co-ownership was reflected in the transcripts of all three of the CITU department heads ($n = 3$; 100%). In referring to CITU's budget, one department head (Interviewee #301) stated "the campus does not understand CITU's budget;" the use of the word "understand" as opposed to the word "know" showed co-ownership. Additionally, one department head (Interviewee #401) indicated the need to construct an appropriate message when CITU is asking student-stakeholders for funds.

Negotiated Rules Proposition. The participant/observer and the two independent coders agree that the CPM propositions of ownership, rules, and negotiated rules were not reflected in the interviewee transcripts of the CITU department heads.

Boundary Turbulence Proposition. The participant/observer and the two independent coders agree that the CPM proposition of boundary turbulence was reflected in the interviewee transcript of one of the three department heads (33.3%). The department head (Interviewee #501) indicated that the complexity of CITU's budget may cause communication misunderstandings if messages are not carefully crafted.

Communication Facet: Disclosure and Nondisclosure Motivations. The participant/ observer and the two independent coders agree that a communication nondisclosure motivation was reflected the interviewee transcript of one of the CITU department heads ($n = 3$; 33.3%), who (Interviewee #301) may have been revealing a communication non-disclosure motivation related to the complexity of the message

construction in the following statement: “perceived complexity in delivering the budget message.”

Communication Facet: Relationship Satisfaction and Dissatisfaction. The participant/observer and the two independent coders also agree that relationship dissatisfaction was reflected in the transcripts of all three of the CITU’s department heads ($n = 3$; 100%). This percentage may be attributed to the interview question itself: “How do you believe the campus perceives CITU?” The used of the word “perceives” may have led the interviewee to comment on the relationship between CITU and its stakeholders.

Communication Facet: Topic Avoidance. The participant/observer and the two independent coders agree that the communication facet of topic avoidance was not reflected in the interviewee transcripts of the CITU department heads.

Communication Facet: Turbulence. Finally, the participant/observer and the two independent coders agree that communication turbulence was reflected in the interviewee transcript of one of the CITU department heads ($n = 3$; 33.3%). In that transcript (Interviewee #501), the department head indicated that relationship dissatisfaction can lead to communication turbulence.

Summary of CITU Department Head Interviews

In the interview responses of the CITU department heads, there were examples of three of the six CPM propositions and three of the four communication facets found in both the organizational communication and the CPM literature. Similar to the results of the EDUCAUSE survey and the interview with the CITU vice president, CITU department

heads expressed great concern for CITU's budget. Additionally, the CITU department heads felt the campus might not be aware of the full impact of those budget constraints on NDSU IT services.

Interviews with NDSU Employees Outside of CITU

In the end, 18 external non-student employees agreed to be interviewed as part of this second study. In an effort to determine if their perceptions mirrored those of the internal CITU department heads, the participant/observer and the two independent coders reviewed the transcripts as described in Chapter Three. Exemplars were again pulled from the study findings in each of the categories. In the 18 interviews with non-CITU employees, the following findings emerged.

Ownership Proposition. The participant/observer found the ownership proposition in six ($n = 18$; 33.3%) of the interviews (#310, ##312, #340, #411, #420, #430); whereas the two independent coders found the ownership proposition in five ($n = 18$; 27.8%) of the interviews (#310, #312, #411, #420, #430). Upon further discussion, the CPM-coder agreed that ownership was present in the sixth interviewee's perception of rigid communication boundaries (Interview #340). An ownership proposition exemplar from those six interviews ($n = 18$; 33.3%) can be found in the assertion of ownership by an external stakeholder: "as an auxiliary [a campus unit that generates its own funding (e.g.: bookstore, dining services, residence life)], we're forced to pay, but we are not always privy to what we are paying for..." (Interviewee #310).

Control Proposition. The participant/observer found the control proposition in three ($n = 18$; 16.7%) of the interviews (#311, #340, #430); whereas the two independent coders found the control proposition in five ($n = 18$; 27.8%) of the interviews (#311, #340, #343, #411, #430). Upon further discussion, the participant/observer agreed that control was present in the administrator described by one interviewee (#343); however, the CPM-coder agreed that control was not present in the last interview (#411). A control proposition exemplar from those four interviews ($n = 18$; 22.2%) is an external stakeholder's move to lessen CITU's control by suggesting that stakeholders who are not informed may construct their own stories regarding CITU (Interviewee #430).

Rules Proposition. The participant/observer and the two independent coders found the rules proposition in four ($n = 18$; 22.2%) of the interviews (#311, #340, #420, #430). A rules proposition exemplar from those four interviews ($n = 18$; 22.2%) is contained in an external stakeholder's knowledge of staff squabbles within CITU, which suggests that CITU has not designated a permeability rule regarding sharing of private information (Interviewee #311).

Co-ownership Proposition. The participant/observer found the co-ownership proposition in seven ($n = 18$; 38.9%) of the interviews (310, #341, #412, #421, #422, #423, #531); whereas the two independent coders found the co-ownership proposition in nine ($n = 18$; 50.0%) of the interviews (#310, #341, #343, #411, #412, #421, #422, #423, #531). Upon further discussion, the participant/observer agreed that an interviewee was seeking co-ownership (#343); however, CPM-coder agreed with the participant/ observer that co-

ownership was not present in one interview (#411). A co-ownership proposition exemplar from those eight interviews ($n = 18$; 44.4%) is found in an external stakeholder's willingness to work with CITU to co-own its budget constraint message for the purpose of finding a solution (Interviewee #423).

Negotiated Rules Proposition. The participant/observer and the two independent coders found the negotiated-rules proposition in four ($n = 18$; 22.2%) of the interviews (#311, #421, #423, #531). A negotiated-rules proposition exemplar from those four interviews ($n = 18$; 22.2%) is contained in the offer of one external stakeholder to “partner” for the express purpose of resolving communication difficulties (Interviewee #531).

Boundary Turbulence Proposition. The participant/observer found the boundary turbulence proposition in five ($n = 18$; 27.8%) of the interviews (#311, #312, #340, #421, #423); whereas the two independent coders also found the boundary turbulence proposition in five ($n = 18$; 27.8%) of the interviews (#312, #343, #412, #421, #423). However, the participant/observer and the two independent coders disagreed on four of the interviews (#311, #340, #343, #412). In two of those interviews, the CPM-coder agreed that boundary turbulence may be a result of lack of rules (#311) and that boundary turbulence was present in the stakeholder's confusion regarding resources (#340). In the other two interviews, the participant/observer agreed that the administrator's refusal to allow for co-ownership created boundary turbulence (#343) and that boundary turbulence was present in the interviewee's relationship with CITU (#412). A boundary turbulence proposition exemplar from those seven interviews ($n = 18$; 38.9%) is one external stakeholder's perception that

“an organization that communicates that poorly must be a poor organization” (Interviewee #312).

Communication Facet: Disclosure and Nondisclosure Motivations. The participant/observer found communication disclosure or nondisclosure motivations present in five ($n = 18$; 27.8%) of the interviews (#310, #311, #340, #411, #531); whereas the two independent coders found communication disclosure or nondisclosure motivations in seven ($n = 18$; 38.9%) interviews (#310, #311, #340, #411, #420, #430, #531). Upon further discussion, the CPM-coder agreed that disclosure motivation was not present in one interviewee’s transcript (#420); while the participant/observer agreed that disclosure motivation was present in one interviewee’s desire to “know more” (#430). A communication disclosure and nondisclosure motivation exemplar from those six interviews ($n = 18$; 33.3%) is found in one external stakeholder’s request that CITU strive to reduce the complexity of its messages (Interviewee #531).

Communication Facet: Relationship Satisfaction and Dissatisfaction. The participant/observer and the two independent coders found communication relationship satisfaction or dissatisfaction present in 13 ($n = 18$; 72.2%) of the interviews (#310, #311, #312, #340, #341, #343, #411, #412, #420, #421, #423, #430, #531). Relationship satisfaction and dissatisfaction exemplars from those 13 interviews ($n = 18$; 72.2%) is found in one external stakeholder’s inability to understand CITU’s choices in making its funding decisions (Interviewee #423).

Communication Facet: Topic Avoidance. The participant/observer found communication topic avoidance present in one ($n = 18$; 5.6%) of the interviews (#340); whereas the two independent coders also found the communication topic avoidance in two ($n = 18$; 11.1%) of the interviews (#343, #430). Upon further discussion, the participant/observer agreed that topic avoidance was present in the top-down avoidance of the topic by administrators (#343). A topic avoidance exemplar from those two interviews ($n = 18$; 11.1%) is found in one external stakeholder's cry that: "we never met" (Interviewee #343).

Communication Facet: Turbulence. The participant/observer found communication turbulence present in four ($n = 18$; 22.2%) of the interviews (#311, #340, #421, #423); whereas, the two independent coders also found the communication turbulence in four ($n = 18$; 22.2%) of the interviews (#343, #412, #421, #423). However, as with the boundary turbulence proposition, the participant/observer and the two independent coders disagreed on four of the interviews (#311, #340, #343, #412). In further discussion, the CPM-coder agreed that communication turbulence may be a result of lack of rules (#311) and that communication turbulence was present in the stakeholder's confusion regarding resources (#340); while the participant/observer agreed that the administrator's refusal to allow for co-ownership created communication turbulence (#343) and that communication turbulence was present in the interviewee's relationship with CITU (#412). A communication turbulence exemplar is found in one external stakeholders questioning of

CITU's rationale in producing messages that are both too complex and too technical for the user to understand (Interviewee #421).

Summary of Non-CITU Employee Interviews

In study #2, none of the NDSU non-student employees specifically expressed concern for CITU's budget, even though all three of the CITU department heads believed CITU's budget constraints were impacting NDSU non-student employee perceptions of CITU. However, interviewee (#311) who claimed the greatest liaison relationship with CITU and who discussed the complexity of CITU's budget at great length did not mention its budget constraints. Consistent with participant responses in study #1, many of the interviewees' comments contained an awareness of funding difficulties within NDSU at their own departmental level; however, it was not uncommon, as described earlier, for that same interviewee (Interviewee 530) to use the interview time to request additional CITU services for their own departments.

Summary of Study #2 Findings

As with the study #1 findings, the interview responses of the CITU department heads contained a baseline message about how the lack of funding for CITU was their paramount concern, a message that echoed the NDSU CITU vice president's responses and the 2011 EDUCAUSE IT issue of funding (Ingemann, et al., 2011). However, as with Study #1, the external interviewees who referred to budget constraints pointed to their own limited departmental budgets, seeming to indicate that CITU's budget was not as limited as their own department's budget. Additionally, although external stakeholders expressed a

strong desire to know what was happening within CITU, their stated reasons for wanting more information were not tied to budgetary concerns.

Finally, in their coding of the interviewees' transcripts, the participant/observer and the two independent coders were able to find instances of all six CPM propositions: 1) ownership, 2) control, 3) rules, 4) co-ownership, 5) negotiated rules, 6) boundary turbulence and all four communication facets of 1) communication disclosure and nondisclosure motivations, 2) relationship satisfaction and dissatisfaction, 3) topic avoidance, and 4) communication turbulence

Chapter Summary

With the exception of the CITU vice president (Study #1) and the three CITU department heads (Study #2), none of the survey participants (Study #1) or the external interviewees (Study #2) expressed concern for CITU's budget constraints. When categorized, the survey participant responses (Study #1) closely resembled the areas of IT concerns identified in the UNL survey. Additionally, in Study #2, examples of each of the six CPM proposition and the four communication facets identified in Chapter Three were found in the interviewees' perceptions of CITU. However, it is noteworthy that the CPM propositions of ownership, rules, and negotiated rules and the communication facet of topic avoidance were not found in the interview transcripts of CITU's department heads. In the next chapter, these findings will be examined.

CHAPTER FIVE. DISCUSSION

“...as a division it truly interacts and provides service to one of the ... [broader] areas of the campus... in terms of faculty, staff, and students... You’d be hard pressed to find one individual that isn’t directly impacted by the services that IT provides” (Interviewee 311)

As the interim leader of one of CITU’s four departments, in this dissertation, I wanted to make practical progress for CITU and for NDSU. As a non-traditional doctoral student, who has spent almost 30 years in a career outside of academia, I found, due to by biases, that throughout this entire project, I was primarily looking for “practical” ways to advance CITU’s relationship with the NDSU campus and secondarily looking for ways to advance the theoretical progress of CPM into the organizational communication arena. In the end, I discovered, perhaps as most doctoral students do, that over time, practice and theory are meant to supplement each other (Petronio, 2004).

Chapter One described the issue/problem and laid the foundation for this project by outlining how the state’s historically limited contribution to NDSU, NDSU’s budget constraints, CITU’s budget-driven environment, and today’s technology challenges within higher education, might all be driving the IT needs/requests of NSDU’s non-student employees and their perceptions of CITU. In Chapter Two, existing organizational literature was reviewed in an effort to discover how the six CPM propositions of ownership, control, rules, co-ownership, negotiated rules, and boundary turbulence might be working within CITU’s organizational structure to influence stakeholder perceptions in and around the four common relational communication facets of disclosure and

nondisclosure motivations, relationship satisfaction or dissatisfaction, topic avoidance, and communication turbulence, which are also found in the organizational literature.

Chapter Three outlined the two methods of data collection (survey and interviews) used in this project; and described how the participant/observer and two sets of independent coders worked together to analyze the collected data in a manner that both admitted and took steps to reduce the potential impact of the participant/observer's bias on the study findings and results. Chapter Four matched the project findings against the project measures and revealed whether CITU's budget constraints were reflected in the IT requests of its stakeholders. Additionally, Chapter Four examined how the five keywords of "budget," "dollar," "fund," "money," and "resource," which describe "funding," were used by CITU's internal and external stakeholders. Finally, with the addition of two more keywords or word-parts: "perception" and "satis," Chapter Four outlined which of the six CPM propositions and the four communication facets the participant/observer and the independent coders found in the interview transcripts of CITU's stakeholders.

This final chapter has been reserved for discussion, implications, limitations, and conclusions related to those findings. Specifically, how might the combined study findings be used to identify communication conditions between CITU and its stakeholders or to interpret stakeholder opinions of CITU? Additionally, how might the context of this project have limited the study results? Finally, what are the practical and theoretical implications of the study findings for CITU and other central IT units? In a practical sense, this chapter also examines whether, given its budget constraints, CITU department heads can

realistically make plans to involve its NDSU stakeholders in an iterative participatory assessment of NDSU's IT environment. In a theoretical sense, this chapter examines how these findings might be extended in future work and the possible implications of those potential extensions for CPM.

Discussion

Twenty-three years after Steinfield and Fulk (1990) anxiously referenced the rapidly changing environment of IT within organizations, the biggest IT challenge facing higher education today is monetary (Ingerman et al., 2011; Ingerman et al., 2010), not technical. As central IT units within institutions of higher education grapple with funding shortfalls, new mechanisms for allocating limited budgets must be found to prevent the budget from driving technology-related decisions. As CITU's budget continues to decline, and departmental resources for IT continue to become more decentralized (Grajek et al., 2012), timing may become critical for CITU and its stakeholders.

In Study #1, the IT needs/requests of NDSU's non-student employees were reviewed by the participant/observer and two independent coders to determine whether the requests contained information regarding CITU's budget constraints (RQ1). In Study #2, the perceptions of NDSU's non-student employees about CITU were reviewed by the participant/observer based on several keywords to determine whether the perceptions contained information regarding CITU's budget constraints (RQ2). Finally, the perceptions of NDSU's non-student employees in Study #2 were examined by the participant/observer

and two independent coders as reflective of the six CPM propositions or the four identified organizational communication patterns also common to CPM (RQ3).

Answering the Research Questions

RQ1: In what ways are CITU's budget constraints recognizable in the IT needs/requests of NDSU non-student employees?

CITU's budget constraints were not recognizable in the IT needs/requests of the NDSU non-student employees who participated in the online email survey. Indeed, only 14 of the 125 survey responses (11.2%) to the four open-ended questions contained in the Study #1 survey cited "funding" in any context. Additionally, consistent with reports in the 2012 EDUCAUSE IT survey (Grajek et al.), each of the participants ($n = 14$; 100%) who mentioned "funding," acknowledged it from the viewpoint of their own department's limited budget or resources, not CITU's.

Care must be taken in over-interpreting these results because the NDSU non-student employees who participated in the online email survey were not specifically asked to comment on CITU's budget, but were asked instead to comment on their IT needs/requests. For the survey participant, the absence of a specific question about CITU's budget may have implied that funding was not a constraint within CITU and may have contributed to the absence of participant responses about budget.

In summary, there appears to be some discrepancies between the conversations IT leaders are having regarding IT issues facing higher education. This conclusion, as documented in the 2011 EDUCAUSE survey, the CITU vice president's endorsement of

that survey, and in the interviews with the three CITU department heads, all of which rank centralized “funding” as a top IT priority against the campus stakeholders’ responses, as documented in the NDSU and UNL survey responses. Additionally, because the NDSU survey responses compare so readily to the results of the UNL survey, on the surface, it would appear that stakeholders on neither campus are overly concerned by budget constraints within their central IT units or, IT stakeholders at NDSU and UNL may not be connecting their IT needs to the budget capacity of their centralized IT units.

Due to limited budgets, centralized IT units, like CITU, are not always able to deliver the IT products and services that their stakeholders request. A potential communication boundary exists between CITU and the campus employee-stakeholders regarding CITU’s budget constraints. Interviewee responses to RQ2 in Study #2 may provide for a closer examination of this communication disconnect by examining the perceptions that NDSU non-student employees have of CITU.

RQ2: In what ways are CITU’s budget constraints recognizable in the perceptions of NDSU non-student employees?

CITU’s budget constraints were not recognizable in the perceptions of NDSU non-student employees. Indeed, none ($n = 57$; 0.0%) of the 10 times variations of the keywords “budget,” “dollar,” “fund,” “money,” and “resource” that were found in the interviewees’ transcripts related to CITU’s budget constraints could be attributed to stakeholders outside of CITU. Even the external interviewee (Interviewee 311) who claimed to have an extensive liaison relationship with CITU did not indicate concern for CITU’s budget.

Again, as with Study #1, care must be taken in interpreting these results because the NDSU non-student employees who participated in the interviews were not specifically asked to comment on CITU's budget, but were asked instead to comment on their perceptions of CITU. For the interviewees, the absence of wording about CITU's budget may have implied that funding was not a constraint. Therefore, the wording of the interview question may have contributed to the absence of interviewees' responses pertaining to CITU's budget.

In summary, there also appears to be a discrepancy between the conversations IT leaders are having regarding IT issues facing higher education, as documented in the 2011 EDUCAUSE survey and in the CITU vice president's endorsement of that survey particularly the top issue of "funding" against campus stakeholder responses, as documented in the NDSU interviewees' responses. Thus, on the surface, it would appear that CITU's stakeholders are not overly concerned by budget constraints within their central IT unit or, IT stakeholders at NDSU may not be connecting their perceptions of CITU to the budget capacity of that centralized IT unit.

RQ3: In what ways are the responses of NDSU's non-student employees to RQ1 and RQ2 reflective of communication patterns of CPM?

The responses of NDSU's non-student employees were coded by the participant/observer and two IRB trained independent coders, one representing IT and one representing CPM, as being reflective of CPM communication patterns. Although the interviews with CITU's department heads in Study #2 did not reflect the CPM proposition

of information ownership, it may be because communication “ownership” is implied by their positions within CITU. Additionally, although the interviews with CITU’s department heads in Study #2 did not reflect the communication facet of topic avoidance, the participant/observer did not expect to see that facet in this set of interviews because one of the proposed outcomes of the study, which was known to the department heads, was to develop communication guidelines that enabled CITU to stop avoiding the topic of budget constraints in its conversations with its stakeholders. Finally, the interviews with CITU’s department heads in Study #2 did not reflect the CPM propositions of rules or negotiated rules, a finding with practical implications for CITU, which are discussed below.

Implications

Practical Implications for CITU

The participant/observer believes that CPM has practical implications for CITU. As CITU begins to more purposefully engage the NDSU campus in conversations regarding its budget constraints, rules for CITU staff and negotiated rules with campus stakeholders who co-own CITU’s budget message will need to be established in order to send a uniform message, to govern collective communication boundaries, and to give individuals within the collectively held boundary the ability or the right to share information with those outside the boundary (Petronio & Caughlin, 2006).

For example, as suggested by the participant/observer and the two independent coders in Study #2 and as indicated in the interviews with the its three department heads in Study #2, CITU has already begun engaging the campus in conversations intended to share

previously private budget information with its stakeholder groups for the purpose of inviting co-ownership. At a recent meeting, with a group of stakeholders, CITU neglected to negotiate rules for co-ownership around the financial information it provided to the group (M. Wallman, personal communication, October 19, 2012). In a subsequent meeting with a different group of stakeholders, the previously shared financial information was used against CITU, without the opportunity for CITU to control the delivery context of the message and explain that “capital reserves” are not “operating reserves.” As a result, CITU lost a funding opportunity for additional operating dollars (M. Wallman, personal communication, January 28, 2013).

As CITU department heads first begin to have budget conversations with institutional stakeholders, it is likely that many will experience anxiety as they learn the information, just as parents might upon learning that their child is seriously ill (Duggan & Petronio, 2009). Similarly, in their initial conversations with NDSU campus stakeholders, CITU department heads should be prepared to respond to stakeholder anxiety about CITU’s budget constraints. Just as the parents of a seriously ill child do not have a “context [from which] to evaluate the seriousness” (Duggan & Petronio, 2009, p. 119) of their child’s illness, NDSU stakeholders may not have a context from which to evaluate the seriousness of CITU’s budget constraints.

Additionally, in the way that emotions surface for parents who learn their child is seriously ill (Duggan & Petronio, 2009), CITU’s stakeholders, upon hearing the budget message, might become emotional regarding the potential consequences of those constraint

messages (e.g., loss of jobs). Again, as with the parents in the above example who might experience additional anxiety due to the time commitment of caring for an ill child (Duggan & Petronio, 2009), CITU's stakeholders, particularly CITU's employees, might experience additional job-related anxiety due to the time commitment required to carefully examine the budget problem. Finally, as with the parents in the above example (Duggan & Petronio, 2009), employees may find that "navigating the complex world" (p. 121) of budget is too overwhelming, making them unresponsive to initial requests for assistance.

Theoretical Implications for CPM

In an effort to assist with advancement of the CPM theory, Petronio has outlined the following five pathways for conducting translational research using CPM research (2007a, 2007b): 1) *Identify the problem*: funding the technology of a research university (Chapter One); 2) *understand the fit*: review the literature and choose which method(s) to use (Chapters Two and Three); 3) *provide evidence*: consolidate the findings (Chapter Four); 4) *convert findings* to an appropriate message (Chapter Five); and 5) *act* on the research (provide directions for future research).

Identify the Problem. Even though North Dakota is an open records state, the issue/problem identified at the beginning of this project, "funding the technology of a research university," focused specifically on how CITU's traditionally private discussions regarding its budget constraints might be driving CITU's ability to engage in straightforward conversations with NDSU's leadership and its non-student employees regarding how their IT needs/requests might be influencing campus-wide perceptions of

CITU. As this study progressed, the CITU's vice president retired and a new interim vice president was named. In the spring of 2012, CITU's interim vice president met with all eight of NDSU's academic colleges and three of its administrative units. Following those meetings, CITU's interim vice president presented findings from those visits at two campus-wide open forums, concluding each presentation with the following statement: "the compilation of data gathered from my campus visits shows that we [CITU] are better individually than we are organizationally" (Wallman, 2012).

Understand the Fit. CPM has not been extensively vetted in the organizational communication arena. One single site project cannot dramatically alter its fit potential. However, given that CITU, a relatively new organization, is operating as a group of unconnected individuals (Wallman, 2012), this project demonstrates how the CPM propositions of 1) ownership, 2) control, 3) rules, 4) co-ownership, 5) negotiated rules, and 6) boundary turbulence might look within an organizational setting. This project also demonstrates that at all four communication facets of 1) communication disclosure and nondisclosure motivations, 2) relationship satisfaction or dissatisfaction, 3) topic avoidance, and 4) communication turbulence found in both the organizational- and CPM-literature are reflective in the perceptions of CITU's stakeholders.

In an IT organization, like CITU, a balancing act, as shown in Figure 6, exists between the user challenges (user IT expectations and requests, shorter user IT adoption timeframes, user-owner IT products and services, and IT user constituency groups) and IT challenges (inadequate funding, declining IT infrastructure lifecycles, and overall data

security). When coupled with any organizational interruption (i.e.: recent merger, change in leadership) or dysfunction (i.e.: firing of a campus president, lack of adequate funding), the organization may behave as a group of unrelated individuals, making the connections between CPM and organizational communication even more appropriate.

Challenges of a Higher Education Central IT Unit

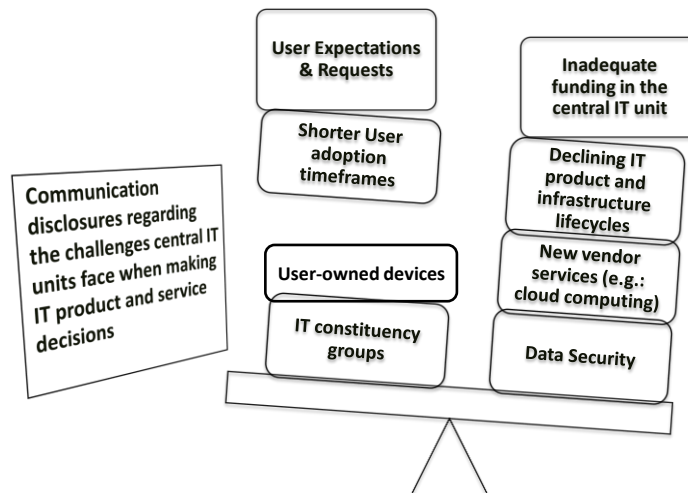


Figure 6. Understanding the CPM fit in organizational communication

Provide Evidence. All six CPM propositions (ownership, control, rules, co-ownership, negotiated rules, and boundary turbulence) were recognizable in transcripts of CITU's stakeholders. Although the assertions made in this project will require further vetting using other potentially private organizational subject matter (e.g., forecasts,

intellectual property, research and development) across other public and private organizations, this project describes CPM's potential utility (Tracy, 2008) in helping to recognize the nuances of communication boundaries within CITU. As further evidence, though the interviewees' transcripts, this project also linked all four facets of communication (disclosure and nondisclosure motivations, relationship satisfaction and dissatisfaction, topic avoidance, and communication turbulence) to the interviewees' transcripts found in both organizational communication and CPM literature.

From the study findings, we learned that NDSU's IT stakeholders are not always satisfied with CITU's communication and that individual campus stakeholders are seeking to better understand centralized IT by asking to be included (establish co-ownership) in CITU's conversations regarding campus-wide IT infrastructure (i.e.: wireless deployment) and campus-wide IT services (i.e.: learning management system).

Convert Findings to an Appropriate Message. The proposed overlap between CPM and organizational communication is the intersection points at which the six CPM propositions are found in the facets of organizational communication identified for this study and how they might be employed as interpersonal skills/competencies for organizational employees to help influence the ways organizations might be impacted whether or not those employees are privy to the private or traditionally private organizational information. These proposed overlaps outlined in Figure 7 represent the interpersonal skills/competencies of organizational employees, in random non-weighted order. The proposed overlaps also symbolize communication challenges for organizations

like CITU and NDSU because they also represent historically constructed boundaries (Greene & Serovich, 1996) around organizational communication.

Initially, for limited campus funding to be prioritized by the campus leadership, central IT units, such as CITU, may need to begin campus-wide meta-communication (T. D. Afifi, 2003; Bateson, 1951) campaigns to address funding issues that may be manifesting themselves in the form of communication nondisclosures, relationship dissatisfaction, topic avoidance, or communication turbulence. The interim CITU vice president and the CITU department heads must also identify what types of internal and external interactions contribute to the formation of alliances and how they, as leaders, might work together with other campus stakeholders to either encourage or discourage those alliances (T. D. Afifi, 2003).

CITU's tradition of professionalism and competence is at risk, balanced against a future of continued budget constraints. In April 2010, in preparation for the 2011 N. D. legislative session, CITU's vice president and the participant/observer presented the observed 2009 IT survey categories to the NDSU's interim president and his cabinet (R. A. Hanson, personal communication, April 26, 2010).

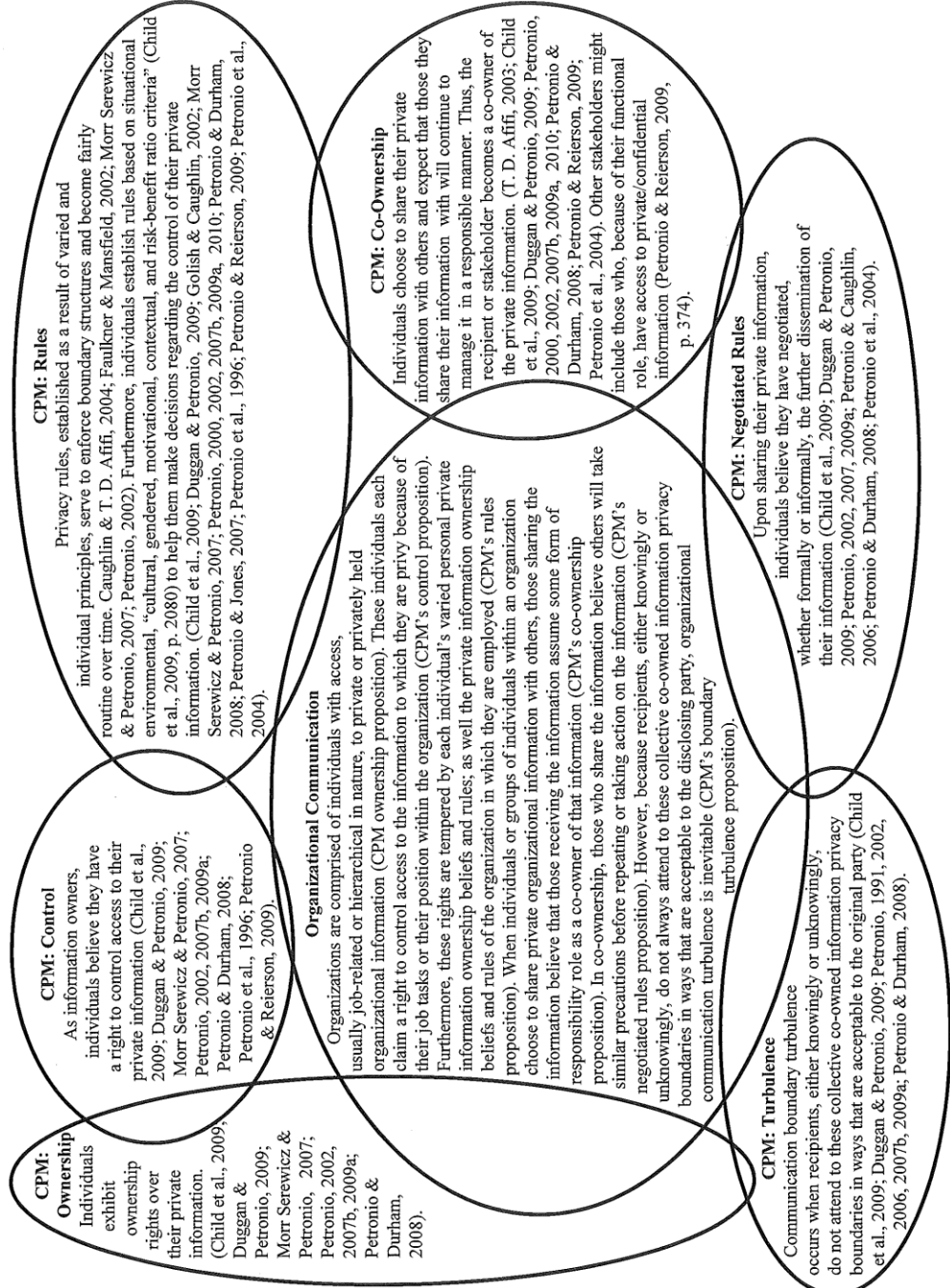


Figure 7. Proposed CPM overlaps to interpersonal skills/traits within organizational communication

Unfortunately, the interim president's priorities needed to remain on other budget matters (Bergeson, 2009), and further IT cost conversations were tabled. Current "funding the technology of a research university" concerns for NDSU include:

- NDSU is working with legislators and its constituency groups to change the state funding model for higher education (Dalrymple, 2011; Forum Editorial, 2011) [this concern is currently being addressed by the state's legislature];
- NDSU's president is working to develop a campus strategic plan that will most likely contain an increased role for CITU (Bresciani, 2011);
- A national search is currently underway to replace the retiring CITU vice president (NDSU, 2011) [in an April 9, 2012 email to the campus, the NDSU Provost, citing a funding shortage, suspended the search to replace the retired vice president].

For NDSU, the realities of the limited budget may take the conversation out of the PAR arena as CITU struggles to become more innovative with less funding. Yet, "disclosure is necessary to receive support and to acquire needed information and assistance" (Greene & Serovich, 1996, p. 53).

The underlying threads of this project, as shown in Figure 7, are rooted in the understanding that organizations are comprised of individuals with access, usually job-related or hierarchical in nature, to private or privately held organizational information (CPM ownership proposition). These individuals each claim a right to control access to the information to which they are privy because of their job tasks or their position within the organization (CPM's control proposition). Furthermore, these rights are tempered by each

individual's varied personal private information ownership beliefs and rules, as well as the private information ownership beliefs and rules of the organization in which they are employed (CPM's rules proposition).

When individuals or groups of individuals within an organization choose to share private organizational information with others, those sharing the information believe that those receiving the information assume some form of responsibility role as a co-owner of that information (CPM's co-ownership proposition). In co-ownership, those who share the information believe others will take similar precautions before repeating or taking action on the information (CPM's negotiated rules proposition). However, because recipients, either knowingly or unknowingly, do not always attend to these collective co-owned information privacy boundaries in ways that are acceptable to the disclosing party, organizational communication turbulence is inevitable (CPM's boundary turbulence proposition).

Act on the Research: What are the Practical Implications for CITU and NDSU? CITU has begun working with campus stakeholders to be more open with its budget messages. However, due to the complexity of its funding picture, CITU is having difficulty developing a budget message. For CITU and other central IT units like it, message complexity can become a non-disclosure motivation. To better engage its stakeholders, CITU must work to establish rules with its internal stakeholders (CITU employees) about how its budget messages are to be shared with its external stakeholders.

Even in an open records state such as North Dakota (Office of the Attorney General, 2011), impermeable communication boundaries may surround communication

messages such that few individuals are in possession of all the details (e.g.: budget messages). While most CITU employees have a limited knowledge of their organization's budgets, the traditionally private budget boundaries, surrounding that information, may prevent or restrict the sharing of budget details with internal and external organizational stakeholders.

Organizational communication boundaries that surround an organization's budget usually are permeable enough that employees know when budget constraints prevent the organization from hiring additional employees, filling position vacancies, or traveling. However, through co-ownership, employees can be placed in a position to better understand and assist with organizational IT decisions. As previously outlined in Figure 6, a communication balance must be found between fully permeable boundaries, which could restrict CITU's ability to centrally manage IT innovation that also serves to balance its user-challenges against its IT-challenges. As user and CITU challenges become more balanced, shared priorities can be established, and future funding decisions can be based on those priorities.

In the past, CITU's non-disclosure motivation may have been the complexity of its message; CITU's current disclosure motivation is to seek campus-wide co-ownership of its funding constraints. This task might prove difficult if CITU's internal and external information ownership boundaries create communication silos that are difficult for CITU's stakeholders to navigate. In addition, communication boundaries that are too difficult or complex to navigate will also create relationship dissatisfaction for CITU's stakeholders

who are asking to co-own the information, especially as they are sometimes required to foot the bill (Interviewee #310).

Impermeable boundaries that result in lack of stakeholder understanding are not acceptable to stakeholders when CITU's services are so impacting to campus, thus CITU must work to establish rules for boundary permeability. Without rules, staff and/or student employees may disclose inappropriately to other internal and external stakeholders causing boundary turbulence. Although "interim" leadership often makes ownership difficult, when communication is adequate and understood there is co-ownership and relationship satisfaction.

Currently, stakeholders' expectations of CITU, do not match the reality of CITU's budget situation due to a lack of permeability surrounding CITU's budget, which might be manifesting itself in stakeholder dissatisfaction. Complex messages require rules for delivery (permeability) and co-ownership (negotiated rules). Additionally, consistency in message complexity is also important, even with varied stakeholder audiences because message consistency lessens communication turbulence due to misunderstanding and increases relationship satisfaction.

Act on the Research: What are the Theoretical Implications for CPM?

Interviewee perceptions often resonated with personal one-on-one experiences with CITU staff. These dialogues of stakeholder interactions, although sometimes occurring in a group setting, tended to be highly personal. These applications of CPM illustrate its utility (Duggan & Petronio, 2009; Tracy, 2008) across each of the four theory communicative

components studied. As an open-records state most of NDSU's non-student financial information is considered to be public (Office of the Attorney General, 2011).

Additionally, these applications illustrate how stakeholders wish to contribute to the construction of impermeable communication boundaries around typically public (non-private) financial details. A more plausible explanation might be that the interviewees' examples illustrate the merit of Petronio et al.'s statement: while "the sharing of responsibilities and decision making is considered helpful and supportive by these advocates ... [it is also] frustrating at times and complicated in general" (2004, p. 48). Thus, stakeholder understanding must occur for information openness to have worth.

Limitations and Directions for Future Projects

Unfortunately, as already described in Chapter Three, the placement of the four open-ended questions in Study #1 may have resulted in a lower participation percentage due to participant fatigue than would have been experienced had the questions been placed before some of the demographical questions. In future projects, the open-ended questions should receive more prominence in the survey order.

Additionally, in hindsight it may have been unrealistic to include the CPM category of "topic avoidance" because there was not been sufficient time in the interview sessions for the participant/observer to establish enough rapport with each interviewee, such that an avoided topic could be identified. In future projects, if the "topic avoidance" category is used, a follow-up question should be asked of the interviewee. For example, if the interviewee suspects that "topic avoidance" may be in play when an obvious subject, such

as “funding.” is not mentioned by an interviewee, the interviewer could ask additional questions of the interviewee to draw out further responses regarding their knowledge of that topic.

Conclusion

As budgets become tighter and CITU’s decisions become more limited, CITU’s decisions will require less campus input. Although collaborative efforts are a worthy call, when budgets on a growing campus become so limited that user-visible services (Figure 2) must be scaled back in order to fund IT infrastructure, innovative IT efforts take a backseat to concerns about IT needs like electric supply and storage. Indicating that resources must be used more wisely throughout the 11-campus university system, one State Board of Higher Education member commented: “this is probably about more funding” (Dalrymple, 2011, p. A12).

The participant/observer believes that the real value of this project, for CITU, will be realized if this document, together with two recent independent reviews by external consultants and the input from recent campus departmental visits by CITU’s interim vice president are combined to create the initial planning document as a first step in an extensive long-term participatory action research (PAR) project involving CITU and its NDSU stakeholders. Collaborative decisions are necessary for CITU to determine which “below-the-surface” IT investments it should make using its limited budget and, more importantly, whether CITU’s funds can be combined with campus funding in ways that empower the campus and prevent duplicated effort. If given the opportunity to engage the

NDSU campus in a more extensive PAR project, CITU will come to gain a more thorough understanding of the needs of its IT stakeholders and CITU's stakeholders will come to more thoroughly understand CITU's budget constraints. CITU and the NDSU campus must work together to find innovative answers to CITU's budget constraints.

As central IT units within higher education plan for the near future, they must work to develop strong relationships between technology use/computer skills and interpersonal skills (Gale, et al., 2002; Kamaria & Lewis, 2009), particularly in the not-for-profit sector (Kamaria & Lewis, 2009) where revenue streams are dictated by others. Thus, CITU department heads and other campus and IT leaders within higher education must take steps to address their campus financial dynamics (Ingerman, et al., 2011; Kamaria & Lewis, 2009) by bringing all their experiences to bear into a solution that includes: “communication, governance, interpersonal skills, budgets and fiscal management” (Kamaria and Lewis, 2009, p. 307) along the communication overlaps identified in Figure 7.

One step in this direction has already been taken; the recently released 2013-15 Governor's budget, which completely revamps the higher education funding model appears to be favorable to NDSU (<http://www.nd.gov/fiscal/docs/budget/execbudgetsummary2013-15.pdf>). Another step involves open communication with campus departments designed to advise those departments of the potential pitfalls in investing their own limited resources in ways that duplicate or additionally burden central system systems and services or in ways

that may not be as secure (i.e.: FERPA - Family Educational Rights and Privacy Act - issues with some cloud computing services) as the central systems.

The road to future associations between organization communication and CPM will be filled with challenges that will help grow the theory (Petronio, 2004). In this instance, CPM may provide CITU's leaders, and other central IT leaders, with an alternative understanding of why conversations with campus stakeholders might be proving difficult and help to bring enhanced interpersonal skills to bear within those organizations. Additionally, understanding of the CPM proposition of "negotiated rules," which was absent in the conversations with CITU's department heads might help to smooth the communication turbulence experienced during these early stages of "co-ownership."

As a recently formed organization, CITU's current reactive-budget driven environment is shaping its technological-change decisions in such a way that the impact on NDSU employees or NDSU as a whole is not being considered. An initial planning document is an important first step in meeting the expectations of CITU's stakeholders like Interviewee #340: *"My perception would be that I would be informed."* An initial planning document is also an essential foundation for CITU, and organizations like it, that wish to take control of their reactive-budget driven environments in such a way that the impact on people and the entire organization is considered. The participant/observer believes that CPM can be helpful in successfully navigating that process.

REFERENCES

- Afifi, T. D. (2003). "Feeling caught" in stepfamilies: Managing boundary turbulence through appropriate communication privacy rules. *Journal of Social and Personal Relationships, 20*, 729-755.
- Afifi, W. A., & Guerrero, L. K. (2000). Motivations and underlying topic avoidance in close relationships. In S. Petronio (Ed.), *Balancing the secrets of private disclosures* (pp. 165-180). Mahwah, NJ: Erlbaum.
- Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: A case study of interrelations between critical success factors. *European Journal of Information Systems, 11*(1), 35-46.
- Allen, D., Kern, T., & Havenhand, M. (2002). ERP critical success factors: An exploration of the contextual factors in public sector institutions. In R. H. Sprague (Ed.), *Proceedings of the 35th Hawaii International Conference on System Sciences* (pp. 3062-3071). Los Alamitos, CA: IEEE Computer Society.
- Allison, D. H., DeBlois, P. B., & the 2008 EDUCAUSE Current Issues Committee. (2008, May/June). Top-10 IT issues 2008. *EDUCAUSE Review, 37*-61.
- Allman, J. (1998). Bearing the burden or baring the soul: Physicians' self-disclosure and boundary management regarding medical mistakes. *Health Communication, 10*, 175-197.

- Alzougool, B., Chang, S., & Gray, K. (2008). Towards a comprehensive understanding of health information needs. *Electronic Journal of Health Informatics*, 3(2). Retrieved November 30, 2011, from <http://www.ejhi.net/ojs/index.php/ejhi/article/view/57/44>
- Anixter, Inc. (2009). *Standards reference guide*. Retrieved November 27, 2011, from [http://www.anixter.com/AXECOM/AXEDocLib.nsf/0/3MFJUPM2/\\$file/Anixter_Stand_Ref_Guide.pdf?openelement](http://www.anixter.com/AXECOM/AXEDocLib.nsf/0/3MFJUPM2/$file/Anixter_Stand_Ref_Guide.pdf?openelement)
- Ashraf, A., Hashmani, M., & Chowdhry, B. S. (2008, May 23). On implementing real-time detection techniques in future network access control (NAC). *Third International Conference on Information and Communication Technologies: From Theory to Applications*. doi:10.1109/ICTTA.2008.4530293
- Baird, J. (1977). *The dynamics of organizational communication*. New York, NY: Harper & Row.
- Bateson, G. (1951). Information and codification: A philosophical approach. In J. Ruesch & G. Bateson (Eds.), *Communication: The social matrix of psychiatry* (pp. 168-211). New York, NY: Norton.
- Baxter, L. A., & Braithwaite, D. O. (2008). Relationship-centered theories of interpersonal communication. In L. A. Baxter & D. O. Braithwaite (Eds.), *Engaging theories in interpersonal communication: Multiple perspectives* (pp. 281-283). Thousand Oaks, CA: Sage Publications, Inc.
- Bergeson, S. (2009, December 18). President Hanson: 'time for a pause.' *NDSU News*. Retrieved April 6, 2011 from: <http://www.ndsu.edu/news/view/article/6723/>

- Biernacki, P. & Waldorf, D. (1981). Snowball sampling: Problems and techniques of chain referral sampling. *Sociological Methods & Research*, 10(2), 141-163.
- Blasko, D. G. (1999). Only the tip of the iceberg: "Who understands what about metaphor?" *Journal of Pragmatics*, 31(12), 1675-1683.
- Bologa, A.-R., Muntean, M., Sabau, G., & Scorta, I. (2009). Higher education ERPs: Implementation factors and their interdependencies. *WSEAS Transactions on Computers*, 4(8), 651-660.
- Bornsen, S. E., Erickson, S., & Ostrom-Blonigen, J. (2004, April). Leadership: A meta-analysis examining assessment of leadership training. Unpublished paper presented at Northwest Communication Association Conference, Coeur d'Alene, ID.
- Boudreau, M.-C., & Robey, D. (2005). Enacting integrated information technology: A human agency perspective. *Organization Science*, 16(1), 3-18.
- Bresciani, D. L. (2011, September 29). *State of the university address*. Retrieved November 9, 2011, from <http://www.ndsu.edu/president/speeches/stateoftheuniversityaddress2011/>
- Budd, J. M. (2007). The Spellings commission: Challenges to higher education and academic libraries. *Libraries & the Academy*, 7(2), 137-146.
- Caughlin, J. P., & Afifi, T. D. (2004). When is topic avoidance unsatisfying? Examining moderators of the association between avoidance and dissatisfaction. *Human Communication Research*, 30, 479-513.

- Caughlin, J. P., & Petronio, S. (2004). Privacy in families. In A. L. Vangelisti (Ed.), *Handbook of family communication* (pp. 379-412). Mahwah, NJ: Erlbaum.
- Cauvin, J.-M., Le Guillou, C., & Lecornu, L. (2008). Indexing the patient recordfile: A 15-year experience in a French hospital [Abstract]. *Information and Communication Technologies: From Theory to Applications*. Retrieved April 1, 2011 from http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=4529930&abstractAccess=no&userType=
- Center on Education Policy. (2007, March 23). States lack funds and staff to monitor supplemental ed services. *Electronic Education Report*, 14(6), 6-7.
- Child, J., Pearson, J., & Petronio, S. (2009). Blogging, communication, and privacy management: Development of the blogging privacy management measure. *Journal of the American Society for Information Science and Technology*, 60(10), 2079-2094.
- Chitiyo, R., & Harmon, S. W. (2009). An analysis of the integration of instructional technology in pre-service teacher education in Zimbabwe. *Educational Technology Research & Development*, 57(6), 807-830.
- Coleman, J. S. (1958). Relational analysis: The study of social organizations with survey methods. *Human Organization*, 17(4), 28-36.
- Conner, J. O., & Strobel, K. (2007). Leadership development: An examination of individual and programmatic growth. *Journal of Adolescent Research*, 22(3), 275-297.

- Cook, C., Heath, F., & Thompson, R. L. (2000). A meta-analysis of response rates in web- or internet-based surveys. *Educational and Psychological Measurement, 60*(6), 821-836.
- Coyle, K. S. (2004). *Crisis, communication, community change, and underage drinking* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations & Theses. (AAT 3181817)
- Dalrymple, A. (2011, November 26). A more efficient higher ed system: Board president wants to streamline plan. *The Forum of Fargo-Moorhead*, pp. A1 and A12.
- Davis, J. T., & Burnett Pettus, A. (1992). Country music radio part III: Radio and world maintenance: A root-metaphor analysis of the Grand Ole Opry, 1948-1958. *Journal of Radio Studies, 1*(1-2), 121-131.
- Denzin, N. K., & Lincoln, Y. S. (2003). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Collecting and interpreting qualitative materials* (2nd ed., pp. 1-45). Thousand Oaks, CA: Sage Publications, Inc.
- Dillman, D. A., & Bowker, D. K. (2001). The web questionnaire challenge to survey methodologists. Retrieved January 31, 2011, from <http://www.sesrc.wsu.edu/dillman/papers/2001/thewebquestionnairechallenge.pdf>
- Dominguez, J. (2009, July 1). The curious case of the CHAOS report 2009. Retrieved October 15, 2012, from <http://www.projectsart.co.uk/the-curious-case-of-the-chaos-report-2009.html>

- Duggan, A., & Petronio, S. (2009). When your child is in crisis: Navigating medical needs with issues of privacy management. In T. Socha & G. Stamp (Eds.), *Parents and children communicating with society: Managing relationships outside of home* (pp. 117-132). New York, NY: Routledge.
- Dymond, S. K., Renzaglia, A., Rosenstein, A., Chun, E. J., Banks, R. A., Niswander, V., & Gilson, C. L. (2006). Using a participatory action research approach to create a universally designed inclusive high school science course: A case study. *Research & Practice for Persons with Severe Disabilities, 31*(4), 293-308.
- Eccher, M. (2012a, February 24). Board rejects NDSU tuition hike request: Bresciani: School 'to the breaking point.' *The Forum of Fargo-Moorhead*, p. A1.
- Eccher, M. (2012b, March 3). College debts balloon: Students feel skyrocketing costs years after graduation. *The Forum of Fargo-Moorhead*, pp. A1 and A10.
- EDUCAUSE. (2011). What is EDUCAUSE? Retrieved November 30, 2011, from <http://www.educause.edu/>
- Egleston, B. L., Miller, S. M., Meropol, N. J. (2011). The impact of misclassification due to survey response fatigue on estimation and identifiability of treatment effects. *Statistics in Medicine, 30*(30), 3560-3572.
- Enuku, U. E., & Ojogwu, C. N. (2006). Information and communication technology (ITC) in the service of the national open university of Nigeria. *Education, 127*(2), 187-195.

- Erickson, S. L. (2006). *A case study of Arthur Andersen's inability to salvage organizational legitimacy* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations & Theses. (AAT 3264678)
- Faulkner, S. L., & Mansfield, P. K. (2002). Reconciling messages: The process of sexual talk for Latinas. *Qualitative Health Research, 12*, 310-328.
- Feder, G. & Savastano, S. (2006). The role of opinion leaders in the diffusion of new knowledge: The case of integrated pest management. *World Development, 34*(7), 1287-1300.
- Fenn, J., & Raskino, M. (2008). *Mastering the hype cycle: How to choose the right innovation at the right time*. Boston, MA: Harvard Press.
- Fiedler, K. D., Grover, V., & Teng, J. T. C. (1996). An empirically derived taxonomy of information technology structure and its relationship to organizational structure. *Journal of Management Information Systems, 13*(1), 9-34.
- Finney, S. (2011). Stakeholder perspective on internal marketing communication [Abstract]. *Business Process Management Journal, 17*(2), 311-331.
- Finney, S., & Corbett, M. (2007). ERP implementation: A compilation and analysis of critical success factors. *Business Process Management Journal, 13*(3), 329-347.
- Fitzpatrick, M. A. (2004). Family communication patterns theory: Observations on its development and application. *Journal of Family Communication, 4*(3&4), 167-179.

- Fontana, A., & Frey, J. H. (2003). The interview: From structured questions to negotiated text. In N. K. Denzin & Y. S. Lincoln (Eds.), *Collecting and interpreting qualitative materials* (2nd ed., pp. 61-106). Thousand Oaks, CA: Sage Publications, Inc.
- Forum Editorial. (2011, November 13). Shortfall at NDSU confirmed. *The Forum of Fargo-Moorhead*, p. C6.
- Gale, H. F., Jr., Wojan, T. R., Olmsted, J. C. (2002). Skills, flexible manufacturing technology and work organization. *Industrial Relations*, 41(1). 48-79.
- Gallagher, K. P., & Gallagher, V. C. (2009). Organizing for post-implementation ERP: A contingency theory perspective. *Journal of Enterprise Information Management*, 25(2), 170-185.
- Gartner, Inc. (2011). Gartner hype cycle. Retrieved October 22, 2011, from <http://www.gartner.com/technology/research/methodologies/hype-cycle.jsp>
- Ghosh, B. (2011). Teaching tip: GlobePort faces global business challenges - Assessing the organizational side of information systems projects. *Journal of Information Systems Education*, 22(2), 87-94.
- Gleason, B. (2010, September 26). World-class greatness at a land-grant university near you? [Online commentary]. *The Chronicle of Higher Education*. Retrieved October 31, 2011, from <http://chronicle.com/article/World-Class-Greatness-at-a/124591/>
- Golden, C. (2009). Leaders for the long haul. *EDUCAUSE Review*, 44(2), 80.
- Golish, T. D. (2003). Stepfamily communication strengths: Understanding the ties that bind. *Human Communication Research*, 29(1), 41-80.

- Golish, T. D., & Caughlin, J. P. (2002). "I'd rather not talk about it": Adolescents' and young adults' use of topic in stepfamilies. *Journal of Applied Communication Research, 30*, 78-106.
- Grajek, S., the 2011-2012 EDUCAUSE IT Issues Panel, & Pirani, J. A. (2012, May/June). Top-10 IT issues 2012. *EDUCAUSE Review, 37-53*.
- Greene, K. (2009). An integrated model of health disclosure decision-making. In T. D. Afifi & W. A. Afifi (Eds.), *Uncertainty, information management and disclosure decisions: Theories and applications* (pp. 226-253). New York, NY: Routledge.
- Greene, K., & Serovich, J. M. (1996). Appropriateness of disclosure of HIV testing information: The perspective of PLWAs. *Journal of Applied Communication Research, 24*, 50-65.
- Griffith, T. L., Zammutoo, R. F., & Aiman-Smith, L. (1999). Why new technologies fail. *Industrial Management, 41*(3), 29-34.
- Helft, P., & Petronio, S. (2007). Communication pitfalls with cancer patients: "Hit and run" deliveries of bad news. *Journal of American College of Surgeons, 205*(6), 807-811.
- Henry, R., Kirsch, L., & Sambamurthy, V. (2003, December). *The role of knowledge in information technology project governance*. Unpublished conference paper presented at the International Conference on Information Systems, Seattle, WA. Retrieved April 1, 2011, from <http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1167&context=icis2003>

- Henry, R., Kirsch, L., & Sambamurthy, V. (2005, August). *The impact of knowledge on the governance of information systems projects*. Abstract of paper presented at the annual meeting of the Academy of Management, Honolulu, HI. Retrieved from EBSCO MegaFILE database. (215165461)
- Herndon, S. L. (1997). Theory and practice: Implications for the implementation of communication technology in organizations. *The Journal of Business Communication, 34*(1), 121-129.
- Hoffman, B. J., Bynum, B. H., Piccolo, R. F., & Sutton, A. W. (2011). Person-organization value congruence: How transformational leaders influence work group effectiveness. *Academy of Management Journal, 54*(4), 779-796.
- Ingerman, B. L., Yang, C., & the 2010 EDUCAUSE Current Issues Committee. (2010, May/June). Top-10 IT issues 2010. *EDUCAUSE Review, 46-60*.
- Ingerman, B. L., Yang, C., & the 2011 EDUCAUSE Current Issues Committee. (2011, May/June). Top-10 IT issues 2011. *EDUCAUSE Review, 25-40*.
- International Business Machines. (2011). *1401 data processing system*. Retrieved September 4, 2011, from http://www-03.ibm.com/ibm/history/exhibits/mainframe/mainframe_PP1401.html
- Jablin, F. M. (1982). Organizational communication: An assimilation approach. In M. E. Roloff & C. R. Berger (Eds.), *Social cognition and communication* (pp. 255-286). Newbury Park, CA: Sage Publications, Inc.

- Kamaria, K., & Lewis, A. (2009). The not-for-profit general management responsive capability competencies: A strategic management perspective. *Business Strategy Series, 10*(5), 296-310.
- Kamhawi, E. M., & Gunasekaran, A. (2009). ERP systems implementation success factors: IS and non-IS managers' perceptions [Abstract]. *International Journal of Business Systems, 4*(6), 688-704.
- Kanaracus, C. (2010, December 17). Biggest ERP failures in 2010. *CIO.com*. Retrieved April 15, 2011, from http://www.cio.com/article/647564/Biggest_ERP_Failures_of_2010?page=2&taxonomyId=3000
- Keys, N., Thomsen, D. C., & Smith, T. F. (2010). Opinion leaders and complex sustainability issues. *Management of Environmental Quality: An International Journal, 21*(2), 187-197.
- King, S. W., Solomon, G. T., & Fernald, Jr., L. W. (2001). Issues in growing a family business: A strategic human resource model. *Journal of Small Business Management, 39*(1), 3-13.
- Klaus, T. (2011). Understanding user dissatisfaction: Exploring the role of fairness in IT-enabled change. *Journal of Organizational and End User Computing, 23*(3), 1-25.
- Koester, J. (2010, October 15). *Confessions of a university president: Information technology and university leadership*. General session address at the EDUCAUSE Annual Conference, Anaheim, CA.

- Kupritz, V. W. & Cowell, E. (2011). Productive management communication: Online and face-to-face. *Journal of Business Communication*, 48(1), 54-82.
- Kurdy, M. B. (2006). Competencies and training needs in the IST in Syria and Mediterranean countries [Abstract]. *Information and Communication Technologies*. Retrieved April 1, 2011 from http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1684379&abstractAccess=no&userType=
- Latchem, C., Jung, I., Aoki, K., & Ozkul, A. E. (2008). The tortoise and the hare enigma in e-transformation in Japanese and Korean higher education. *British Journal of Educational Technology*, 39(4), 610-630.
- Lindlof, T. R. (1995). *Qualitative communication research methods*. Thousand Oaks, CA: Sage Publications, Inc.
- Lindlof, T. R., & Taylor, B. C. (2002). *Qualitative communication research methods* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Lindlof, T. R., & Taylor, B. C. (2011). *Qualitative communication research methods* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Littlefield, R. S. (2001). High school student perceptions of efficacy of debate participation. *Argumentation and Advocacy*, 38(2), 83-97.
- Lombard, M., Snyder-Duch, J., & Bracken, C. C. (2002). Content analysis in mass communication: Assessment and reporting of intercoder reliability. *Human Communication Research*, 28(4), 587-604.

- Mackay, N. (1992). Review of "Conscious and unconscious: Freud's dynamic distinction reconsidered" [Review of the book *Conscious and unconscious: Freud's dynamic distinction reconsidered*, by P. S. Herzog]. *Psychoanalytic Psychology*, 9(4), 579-586.
- Mann, S. (2011, May 23). What is the lifespan of a desktop computer? *Bright Hub*. Retrieved October 30, 2011, from <http://www.brighthub.com/computing/hardware/articles/14363.aspx>
- Margulis, S. T. (2003). On the status and contribution of Westin's and Altman's theories of privacy. *Journal of Social Issues*, 59(2), 411-429.
- Mason, J. (1994). Linking qualitative and quantitative data analysis. In A. Bryman & R. G. Burgess (Eds.). *Analyzing qualitative data* (pp. 89-110). New York: Routledge.
- McConnell, S. (1998). Feasibility studies. *IEEE Software*, 15(3), 119-120.
- McDowell, G. R. (2003). Engaged universities: Lessons from the land-grant universities and extension. *The ANNALS of the American Academy of Political and Social Science*, 585(1), 31-50.
- McIntyre, A. (2008). *Participatory action research: Qualitative research methods*. Retrieved October 31, 2011, from http://www.sagepub.com/upm-data/18076_Chapter_1.pdf
- Medved, C. E. (2007). Investigating family labor in communication studies: Threading across historical and contemporary discourses. *Journal of Family Communication*, 7(4), 225-243.

- Metzger, M. J. (2007). Communication privacy management in electronic commerce. *Journal of Computer-Mediated Communication, 12*(2). Retrieved September 1, 2010, from <http://jcmc.indiana.edu/vol12/issue2/metzger.html>
- Microsoft. (2013). *Product support lifecycle information by product family*. Retrieved April 24, 2013, from <http://support.microsoft.com/lifecycle/?ln=en-gb&c2=1173>
- Microsoft. (2011). *Windows lifecycle fact sheet*. Retrieved October 30, 2011, from <http://windows.microsoft.com/en-us/windows/products/lifecycle>
- Miller, V., Allen, M., Casey, M., & Johnson, J. (2000). Reconsidering the organizational identification questionnaire. *Management Communication Quarterly, 13*(4), 626-658.
- Montoya, M. J., & Kent, E. E. (2011). Dialogical action: Moving from community-based to community-driven participatory research. *Qualitative Health Research, 21*(7), 1000-1011.
- Morr, M. C. (2002). Private disclosure in a family membership transition: In-laws' disclosures to newlyweds. Unpublished doctoral dissertation, Arizona State University, Pheonix.
- Morr Serewicz, M. C., & Petronio, S. (2007). Communication Privacy Management theory: Ethical considerations. In B. B. Whaley & L. Turner (Eds.), *Explaining communication: Contemporary theories and exemplars*, (pp. 257-274). Mahwah, NJ: Lawrence Erlbaum Associates.

- Mumby, D. K. & May, S. (2005). Introduction: Thinking about engagement. In S. May & D. K. May (Eds.), *Engaging organizational communication: Theory & research – Multiple perspectives*, (pp. 1-14). Thousand Oaks, CA: Sage Publications, Inc.
- Nan, N., & Harter, D. E. (2009). Impact of budget and schedule pressure on software development cycle time and effort. *IEEE Transactions on Software Engineering*, 35(5), 624-637.
- Nan, N., Harter, D., & Thomas, T. (2005, August). Impact of schedule and budget pressure on software development: A behavioral perspective. Abstract of paper presented at the annual meeting of the Academy of Management, Honolulu, HI. Retrieved from EBSCO MegaFILE database. (215165461)
- National Conference of State Legislators. (2010). State funding for higher education in FY 2009 and FY 2010. Retrieved April 6, 2011, from <http://www.ncsl.org/documents/fiscal/HigherEdFundingFINAL.pdf>
- Neumann, R. (1993). Perception of senior academic administrators. *Higher Education*, 25(2), 97-110.
- New Zealand Ministry of Education. (2010). Is bilingualism a problem? Retrieved March 12, 2011, from <http://leap.tki.org.nz/Is-bilingualism-a-problem>
- North Dakota Legislative Council. (1999). *1999 Sessions laws, House Bill No. 1003, Board of Higher Education, North Dakota State University, Section 1.7*. Retrieved November 10, 2011, from <http://www.legis.nd.gov/assembly/56-1999/session-laws/documents/SL9APPRO.pdf#CHAPTER3>

- North Dakota Legislative Council. (2006). History of the enterprise resource planning system initiative (ConnectND). Retrieved November 21, 2011, from <http://www.legis.nd.gov/assembly/59-2005/docs/pdf/79266.pdf>
- North Dakota Legislative Council. (2011). *2011 Sessions laws, House Bill No. 1003, North Dakota State University, Section 1.6*. Retrieved November 10, 2011, from <http://www.legis.nd.gov/assembly/62-2011/session-laws/documents/APPRO.pdf#pagemode=bookmarks&CHAPTER3>
- North Dakota's Office of Management and Budget. (2013). *2013-15 budget guidelines for state agencies*. Retrieved December 10, 2012, from <http://www.nd.gov/omb/docs/2013-15-budget-guidelines-state-agencies-bullet-points.pdf>
- North Dakota State University. (2008a). *Information technology services pyramid*. Fargo, ND: Information Technology Division.
- North Dakota State University. (2008b). *Research rankings: A national snapshot*. Retrieved November 10, 2011, from <http://www.ndsu.nodak.edu/research/reports/NDSU-NSF08rankings.pdf>
- North Dakota State University. (2009). *Annual report of external funding awards*. Retrieved November 8, 2011, from http://www.ndsu.nodak.edu/research/spa/forms/acrobat/annual_report_2009.pdf
- North Dakota State University. (2010a). *Fall 2010 statistical profile of NDSU*. Retrieved November 8, 2011, from http://www.ndsu.edu/oira/quick_facts/#c39205

North Dakota State University. (2010b). *IT Division: 2009-2010 annual report*. Retrieved

November 21, 2011, from

<http://www.ndsu.edu/fileadmin/vpit.ndsu.edu/AnnualReport/AnnualReport2009-2010-Final.pdf>

North Dakota State University. (2010c, August 29). *NDSU makes move to Outlook-based*

e-mail and calendaring. Retrieved April 7, 2012, from:

<http://www.ndsu.edu/its/news/article/9275/>

North Dakota State University. (2011a). *Annual enrollments–Fall term enrollments*.

Retrieved November 8, 2011, from

<http://www.ndsu.edu/fileadmin/registrar/enrollment/enrollsummary.pdf>

North Dakota State University. (2011b). *Office of International Programs enrollment by*

country fall semester. Retrieved November 10, 2011, from

http://www.ndsu.edu/fileadmin/international.ndsu.edu/Country_Lists/Fall_2011_Enrollment_Country_List.pdf

North Dakota State University. (2012a). *GDC history*. Retrieved March 30, 2012, from

http://www.ndsu.edu/gdc/?page_id=217

North Dakota State University. (2012b). *North Dakota State University – Information*

Technology Council: Bylaws. Retrieved April 2, 2012, from

<http://www.ndsu.edu/fileadmin/vpit.ndsu.edu/ITCouncil/ITCouncil-Bylaws-v08c.pdf>

- North Dakota State University. (2012c). *Vice president for information technology*. Retrieved April 3, 2012, from <http://www.ndsu.edu/vpit/>
- North Dakota University System. (2011a). *Headcount and FTE enrollments–Institution totals*. Retrieved November 10, 2011, from <http://www.ndsu.edu/fileadmin/registrar/enrollment/1210/report-a.pdf>
- North Dakota University System. (2011b). *Headcounts by institution and gender: Institutional totals*. Retrieved November 9, 2011, from <http://www.ndsu.edu/fileadmin/registrar/enrollment/1210/report-j.pdf>
- North Dakota University System. (2011c). *State general fund appropriations and net tuition revenues*. Retrieved November 6, 2011, from <http://www.ndus.edu/uploads/reports/39/12-2010-accountability-measures-report.pdf>
- Novak, J. M. (2006). *Risk communication in high reliability organizations: Democratic communication as the bridge between mindfulness and mindlessness* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations & Theses. (AAT 3234088)
- O'Connor, A. (2011). Just a job? Communication, ethics and professional life [Review of the book *Just a Job? Communication, Ethics, & Professional Life*, by G. Cheney, D. J. Lair, D. Ritz, & B. E. Kendall]. *Journal of Communication*, 61(1), E1-E3. Available from Wiley Online Library Web site: <http://onlinelibrary.wiley.com/doi/10.1111/j.1460-2466.2010.01533.x/pdf>

- Office of the Attorney General. (2011, August). *A summary of North Dakota's open meetings and open records laws*. Retrieved November 25, 2011, from <http://www.ag.nd.gov/openrecords/ORSummary.pdf>
- Office of the Comptroller, Commonwealth of Virginia. (2011). *Common accounting policies and principles manual, 30605: Asset depreciation–Useful life*. Retrieved October 22, 2011, from http://www.doa.virginia.gov/Admin_Services/CAPP/CAPP_Topics/30605.pdf
- O'Leary, D. E. (2008). Gartner's hype cycle and information system research issues. *International Journal of Accounting Information Systems*, 9(4), 240-252.
- Ostrom-Blonigen, J. (2007, March). *Emerging from the cocoon: Reestablishing privacy boundaries breached by illness*. Unpublished paper presented at the Central States Communication Association Conference, Minneapolis, MN.
- Ostrom-Blonigen, J., Allen, M., Bornsen, S. E., & Erickson, S. (2008, November). Acknowledging the paucity of leadership training assessment across the disciplines. Unpublished paper presented at National Communication Association Conference, San Diego, CA.
- Ostrom-Blonigen, J., Bornsen, S. E., Larson-Casselton, C., & Erickson, S. L. (2010). Bridging student leadership assessment across a three-institution consortium. *Communication Teacher*, 24(4), 247-257.

- Ostrom-Blonigen, J., & Neas, B. (2008, September). *Funding the technology of a research university*. Unpublished paper submitted to EDUCAUSE Regional Conference, Chicago, IL.
- Ostrom-Blonigen, J., Roeber, R., & Neas, B. (2009, March). *Formulating funding and organizational strategies at a modern research university*. Unpublished paper presented at the EDUCAUSE Regional Conference, Chicago, IL.
- Ozer, E. J., Ritterman, M. L., & Wanis, M. G. (2010). Participatory action research (PAR) in middle school: Opportunities, constraints, and key processes. *American Journal of Community Psychology, 46*(1-2), 152-166.
- Padrón, E. J. (2009). An American crisis. *Presidency, 12*(1), 15-23.
- Peekhaus, W. (2010). The neoliberal university and agricultural biotechnology: Reports from the field. *Bulletin of Science, Technology & Society, 30*(6), 415-429.
- Peel, K. (1998). *The family manager's everyday survival guide*. New York, NY: Ballantine.
- Peel, K. (2003). *The family manager takes charge*. New York, NY: Perigee.
- Petronio, S. (1991). Communication boundary management: A theoretical model of managing disclosure of private information between marital couples. *Communication Theory, 1*(4), 311-335.
- Petronio, S. (2000). The boundaries of privacy: Praxis of everyday life. In S. Petronio (Ed.), *Balancing the secrets of private disclosures* (pp. 37-49). Mahwah, NJ: Lawrence Erlbaum Associates.

- Petronio, S. (2002). *Boundaries of privacy: Dialectics of disclosure*. New York: State University of New York Press.
- Petronio, S. (2004). The road to developing communication privacy management: Narrative in progress, please stand by [Special issue]. *Journal of Family Communication*, 4, 193-208.
- Petronio, S. (2006). Impact of medical mistakes: Negotiating work-family boundaries for physicians and their families. Forum on Family and Work Boundaries. *Communication Monographs*, 73(4), 462-467.
- Petronio, S. (2007a). JACR commentaries on translation research into practice: Introduction. *Journal of Applied Communication Research*, 35(3), 215-217.
- Petronio, S. (2007b). Translational endeavors and the practices of communication privacy management. *Journal of Applied Communication Research*, 35(3), 218-222.
- Petronio, S. (2009a). Privacy. *Encyclopedia of human relationships*. Retrieved September 1, 2010, from http://www.sage-reference.com/humanrelationships/Article_n419.html
- Petronio, S. (2009b). Privacy management theory. *Encyclopedia of communication theory*. Retrieved September 1, 2010, from http://www.sage-reference.com/communicationtheory/Article_n302.html
- Petronio, S. (2010). Communication privacy management theory: What do we know about family privacy regulation? *Journal of Family Theory & Review*, 2, 175-196.

- Petronio, S., & Caughlin, J. P. (2006). Communication privacy management theory: Understanding families. In D. O. Braithwaite & L. A. Baxter (Eds.), *Engaging theories in family communication: Multiple perspectives* (pp. 35-49). Thousand Oaks, CA: Sage Publications, Inc.
- Petronio, S., & Durham, W. (2008). Understanding and applying communication privacy management theory. In L. A. Baxter & D. O. Braithwaite (Eds.), *Engaging theories in family communication* (pp. 309-322). Thousand Oaks, CA: Sage Publications, Inc.
- Petronio, S., & Jones, S. M. (2007). When “friendly advice” becomes a privacy dilemma for pregnant couples: Applying communication privacy management theory. In L. Turner & R. West (Eds.), *Family communication: A reference for theory and research* (pp. 201-218). Thousand Oaks, CA: Sage Publications, Inc.
- Petronio, S., & Kovach, S. (1997). Managing privacy boundaries: Health providers’ perceptions of resident care in Scottish nursing homes. *Journal of Applied Communication Research*, 25, 115-131.
- Petronio, S., & Ostrom-Blonigen, J. (2008a, July), *The Logic of Privacy and the Management of Disclosure - Implications and Applications of Communication Privacy Management: Emerging from the Cocoon: Reestablishing Privacy Boundaries Breached by Illness*. Participant panel at the International Association for Relationship Research Conference, Providence, RI.

- Petronio, S., & Ostrom-Blonigen, J. (2008b, November). *Family factor - Learning to face health predicaments: Family stress of managing privacy during cancer care the second time around*. Participant panel at the National Communication Association Conference, Panel Participant, San Diego, CA
- Petronio, S., Reeder, H. M., Hecht, M. L., & Mon't Ros-Mendoza, T. M. (1996). Disclosure of sexual abuse by children and adolescences. *Journal of Applied Communication Research*, 24, 181-199.
- Petronio, S., & Reiersen, J. (2009). Regulating the privacy of confidentiality: Grasping the complexities through communication privacy management theory. In T. Afifi & W. Afifi (Eds.), *Uncertainty, information management, and disclosure decisions: Theories and applications* (pp. 365-383). New York, NY: Routledge.
- Petronio, S., Sargent, J., Andea, L., Reganis, P., & Cichocki, D. (2004). Family and friends as healthcare advocates: Dilemmas of confidentiality and privacy. *Journal of Social and Personal Relationships*, 21, 33-52.
- Phipps, M. & Swiderski, M. (1990). The "soft" skills of outdoor leadership. In J.C. Miles & S. Priest (Eds.) *Adventure education* (pp. 221-232). State College, PA: Venture.
- Reiersen, J. L. (2009). *Finding voice through crisis: Critical and cultural implications for the crisis renewal model* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations & Theses. (AAT 3388221)

- Roeber, R. (2008, September). Engaging campus users and stakeholders in a campus-wide IT services review. Unpublished paper submitted to EDUCAUSE Regional Conference, Chicago, IL.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: The Free Press.
- Salem, P. (2008). The seven communication reasons organizations do not change. *Corporate Communications: An International Journal*, 13(3), 333-348.
- Serewicz, M. C. M., & Petronio, S. (2007). Communication privacy management theory. In B. B. Whaley & W. Santer (Eds.), *Explaining communication: Contemporary theories and exemplars* (pp. 257-274). Mahwah, NJ: Lawrence Erlbaum Associates.
- Smith, C. J. (2010). "Distance learning" or "learning at a distance"? Case study of an education initiative to deliver an in-service bachelors degree in Zambia. *Innovations in Education and Teaching International*, 47(2), 223-233.
- Smith, H. A. & McKeen, J. D. (2010). Developments in practice XXXVI: How to talk so business will listen ... And listen so business will talk. *Communication of the Association for Information Systems*, 27(13), 207-216.
- Smith, R. C., & Eisenberg, E. M. (1987). Conflict at Disneyland: A root-metaphor analysis. *Communication Monographs*, 54(4), 367-380.
- Smith, S. D., & Caruso, J. B. (2010). The ECAR study of undergraduate students and information technology. Retrieved January 30, 2011, from <http://net.educause.edu/ir/library/pdf/EKF/EKF1006.pdf>

- Sotirin, P., Buzzanell, P. M., & Turner, L. H. (2007). Colonizing family: A feminist critique of family management texts. *Journal of Family Communication, 7*(4), 245-263.
- Srinivasan, K., & Fisher, D. (1995). Machine learning approaches to estimating software development effort. *IEEE Transactions on Software Engineering, 21*(2), 126-137.
- Stanley, D. J., & Malenfant, K. J. (2010). Futures thinking for academic librarians: Higher education in 2025. *Information Services & Use, 30*(1/2), 57-90.
- Steele, F. (1975). *The open organization: The impact of secrecy and disclosure on people and organizations*. Menlo Park, CA: Addison-Wesley.
- Steinfeld, C. W., & Fulk J. (1990). The theory imperative. In J. Fulk & C. W. Steinfield (Eds.), *Organizations and communication technology* (pp. 13-25). Thousand Oaks, CA: Sage Publications, Inc.
- Sullivan, L. S. (2009). *Post-implementation success factors for Enterprise Resource Planning (ERP) student administration systems in higher education institutions* (Doctoral dissertation). Retrieved from US: ProQuest Information & Learning. (3383697)
- Sullivan, L. S., & Bozeman, W. (2010). Post-implementation success factors for Enterprise Resource Planning student administration systems in higher education institutions. *College & University, 86*(2), 22-31.
- Sundstrom, E., De Meuse, K. P., & Futrell, D. (1990). Work teams: Applications and effectiveness. *American Psychologist, 45*, 120-133.

- Sussman, L. (2008). Disclosure, leaks, and slips: Issues and strategies for prohibiting employee communication. *Business Horizons*, 51(4), 331-339.
- Sutanto, J., Kankanhalli, A., Tay, J., Raman, K. S., & Tan, B. C. Y. (2008). Change management in interorganizational systems for the public. *Journal for Management Information Systems*, 25(3), 133-175.
- Tellis, W. (1997). Introduction to case study. *The Qualitative Report*, 3(2). Retrieved April 3, 2012, from <http://www.nova.edu/ssss/QR/QR3-2/tellis1.html>
- The 451 Group. (2011). Infrastructure computing for the enterprise: ICE. Retrieved March 12, 2011, from http://www.451group.com/ice/451_ice.php
- The Standish Group. (1995). The Standish Group report: Chaos. Retrieved September 17, 2011, from <http://net.educause.edu/ir/library/pdf/NCP08083B.pdf>
- The Standish Group. (2009). The Standish Group: Chaos summary 2009. Retrieved September 17, 2011, from http://www1.standishgroup.com/newsroom/chaos_2009.php
- Tinsley, H. E. A., & Weiss, D. J. (1975). Interrater reliability and agreement of subjective judgments. *Journal of Counseling Psychology*, 22(4), 358-376.
- Tinsley, H. E. A., & Weiss, D. J. (2000). Interrater reliability and agreement. In H. E. A. Tinsley & S. D. Brown (Eds.), *Handbook of applied multivariate statistics and mathematical modeling* (pp. 95-124). San Diego, CA: Academic Press.
- Tracy, K. (2008). Action-implicative discourse analysis theory: Theorizing communicative practices. In L. A. Baxter & D. O. Braithwaite (Eds.), *Engaging theories in*

- interpersonal communication: Multiple perspectives* (pp. 149-160). Thousand Oaks, CA: Sage Publications, Inc.
- Travnicek, A. J. (2008). *Social networks for lake management in Becker and Otter Tail Counties, MN: A case study* (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations & Theses. (AAT 3337561)
- University of Nebraska – Lincoln (2009, June 30). Results of UNL’s campus information technology services survey. Office of the Senior Vice Chancellor for Academic Affairs. Retrieved September 25, 2010, from:
<http://www.unl.edu/svcaa/itreview/summary.shtml>
- Venable, M. A. (2010). Using technology to deliver career development services: Supporting today’s students in higher education. *The Career Development Quarterly*, 59(1), 87-96.
- Wadsworth, Y. (1998). What is participatory action research? *Action Research International*, 2. Retrieved September 18, 2011, from
<http://www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html>
- Wallman, M. (2012, August 29 and 30). *Results of campus departmental visits*. Presented at campus-wide open forums, NDSU Century Theater.
- Walter, M. (2009). Participatory action research. In M. Walter (Ed.), *Social research method* (2nd ed., Chapter 21). Retrieved September 18, 2011, from
http://www.oup.com.au/__data/assets/pdf_file/0007/198358/Part_5_ORC_combine.pdf

- Whitbred, R. (2003). *Differences in perceptions of organizational mission: An extension and empirical test of unified diversity*. Available from Conference Papers -- International Communication Association Web site:
<http://web.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=9&hid=18&sid=f8cb055f-e3d0-4f31-9292-e0afe0471d9e%40sessionmgr10>
- Wu, J.-H., Chen, Y.-C., & Greenes, R. A. (2009). Healthcare technology management competency and its impacts on IT-healthcare partnerships development. *International Journal of Medical Informatics*, 78(2), 71-82.
- Yin, R. K. (1994). Discovering the future of the case study method in evaluation research. *Evaluation Practice*, 15(3), 283-290.
- Yin, R. K. (2004). *The case study anthology*. Thousand Oaks, CA: Sage Publications, Inc.
- Yin, R. K. (2009). *Case study research: Design methods* (4th ed.). Thousand Oaks, CA: Sage Publications, Inc.

APPENDIX A. STUDY #1: 2008 IRB APPROVAL LETTER

NDSU

NORTH DAKOTA STATE UNIVERSITY

Institutional Review Board

*Office of the Vice President for Research, Creative Activities and Technology Transfer
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Federalwide Assurance #FWA00002439
Expires April 24, 2011

September 17, 2008

Dr. Robert Littlefield
Dept. of Communication
321 Minard Hall

Re: IRB Certification of Human Research Project: **"Funding the Technology of a Research University"**
Protocol #: **HS08236**

Co-investigator(s) and research team: **Jean Ostrom-Blonigen, Jeffrey Gerst, Cloy Tobola**


Study site(s): **NDSU** Funding: n/a

The IRB has determined that this human subjects research project qualifies for exempt status (category # 2b) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*). This determination is based on the revised application received 9/15/08. Please also note the following:

- This determination of exemption expires 3 years from this date. If you wish to continue the research after 9/16/2011, submit a new protocol several weeks prior to this date.
- The project must be conducted as described in the approved protocol. If you wish to make changes, pre-approval is to be obtained from the IRB, unless the changes are necessary to eliminate an apparent immediate hazard to subjects. A *Protocol Amendment Request Form* is available on the IRB website.
- Prompt, written notification must be made to the IRB of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Any significant new findings that may affect the risks and benefits to participation will be reported in writing to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance with IRB policies.

Thank you for complying with NDSU IRB procedures; best wishes for success with your project.

Sincerely,


Teryl Grosz, MS, CIP
IRB Director

NDSU is an equal opportunity institution.

APPENDIX B. STUDY #1: QUESTIONNAIRE

1. Age (Please choose from the age ranges listed below.)
2. Please identify your division of employment from the list below (OPTIONAL – Please choose from the division names listed below.)
3. Gender (Male or female.)
4. Level of Education (Please choose from the education levels listed below.)
5. Are you a student employee? (If “yes,” survey was complete; if “no,” continue to #6.)
6. Are you a full-time employee of NDSU (for purposes of this questionnaire, faculty members on 9- or 10-month contracts are considered to be full time employees)? (Yes or no.)
7. If not, how many hours per week do you work? (Please choose from the hour ranges listed below.)
8. Are you eligible for overtime pay? (Yes or no.)
9. Activities related to administrative support requiring the use of core IT applications or services to support ongoing business functions of the department (general word processing, spreadsheets, PeopleSoft entry/lookup, etc.). (Please choose from the hour ranges listed below.)
10. Departmental support such as answering basic core level questions related to personal productivity software (e.g. Microsoft Office), network applications (e.g. calendar, e-mail, etc.), desktop computers, mobile computing devices (laptops, PDAs, etc.) and peripherals (printers). This also includes responsibilities of the telephone administrator. (Please choose from the hour ranges listed below.)
11. Functions related to the desktop setup (including software installation, configuration) and maintenance of computers (laptops, PDA, etc.) and peripherals of a more complex nature. The creation and maintenance of disk images, application of patches and updates and all scheduled maintenance, installation/support of Novell, Microsoft Exchange or Active Directory may also be included as responsibilities. (Please choose from the hour ranges listed below.)

12. Work with the department's core business applications, and support the core day-to-day use of such applications. These often are department/college specific applications (systems like Adirondack, scheduling software, Image Now, Titanium, XOXOS, etc) For instance helping a user accomplish a specific business function, writing a query or updating value in a validation table would also qualify as business application support. (Please choose from the hour ranges listed below.)
13. Install, develop and support various specific packaged applications and their associated data, including managing vendor relationships, and providing necessary business context for integration. Includes installing new releases and bug fixes, extracting data for use by other applications, updating, and making enhancements to existing software applications to meet new requirements, customizing reports for users, interfacing with vendor staff as required, engineering new software to meet business needs, integrate third party software and accommodate special requests. Development phases include design, coding, testing, implementation and management maintenance. (Please choose from the hour ranges listed below.)
14. Provide basic content to an established Web site. Routinely maintain and change information as needed. Works with appropriate technical staff related to operational and site issues. (Please choose from the hour ranges listed below.)
15. Design, develop or program Web pages for the department. Responsible for layout, file management, content. Includes using advanced features of software programs such as Dreamweaver or Typo3. Knowledge of HTML or scripting languages (Java, PHP, Perl, ASP, etc.). Could require some server administration. (Please choose from the hour ranges listed below.)
16. Provide technology-related instruction to staff aimed at enhancing their skills, knowledge and performance. Includes training requirement analysis, course design and development, and training delivery. May include core instructional computing use of Blackboard, IVN, or videoconferencing. (Please choose from the hour ranges listed below.)
17. Integrate the use of advanced technology tools within a discipline. Encompasses instructional computing of an advanced nature using resource tools such Blackboard, videoconferencing, Moodle, Wimba, Skype, Multimedia (broadcast, podcasts), or other technology based learning tools. (Please choose from the hour ranges listed below.)

18. Responsible for server administration/systems. Includes the activities related to implementing and maintaining network servers. These activities also include administration, account management and operation of file, print and application servers and other logical network devices, performance management, tuning, applying operating system patches and upgrades, and administering configuration data. (Please choose from the hour ranges listed below.)
19. Conduct activities related to implementing and maintaining the operational integrity of the organization's local and wide-area networks, both wired and wireless. Technologies include building wiring, fiber optic data circuits, and point-to-point technologies such as laser and microwave. These activities include responding to user requests for assistance, performance monitoring, coordinating with external network service providers and taking appropriate corrective actions as needed. (Please choose from the hour ranges listed below.)
20. Perform research activities requiring advanced application technologies, high performance computing systems, data mining, or the deployment of projects that disseminate large masses of relevant data/information to appropriate parties. (Please choose from the hour ranges listed below.)
21. Engage in activities related to identifying and evaluating the future directions for IT application, networks and hardware for the organization. Includes capacity planning, storage, strategic planning, and technology research and feasibility studies. (Please choose from the hour ranges listed below.)
22. Additional areas not specifically describe above, please describe and list the average number of days spent each week on those duties. (Please choose from the hour ranges listed below.)
23. For purposes of costing NDSU's total information technology cost, please identify your annual salary range. (Please choose from the salary ranges listed below.)
24. Participate in the effort to monitor, assess, and report IT risks, threats, or vulnerabilities. Serve in an advocacy role to help communicate security information, privacy policies, copyright, and intellectual property issues and provide general security awareness training for the department. (Please choose from the hour ranges listed below.)

25. Responsible for the security issues for physical network and data access for the department and its facilities. Activities related to developing, maintaining and administering an overall security plan and approach for the organization's host processors, servers, personal computers, communication devices and networks. (Please choose from the hour ranges listed below.)
26. Develop, write, implement and enforce security policies, guidelines and procedures for administration of IT functions within the department or college in accordance with campus policy compliance and information security laws, rules and regulations of broad impact and significance. (Please choose from the hour ranges listed below.)
27. Other, please describe and indicate the significance of the activity.
28. Given that NDSU's key missions are instruction, research and outreach, please list and describe your top priority information technology services that NDSU requires now or should require within the next five years to effectively carry out these missions (Example services: enhanced computational capacity, visualization or other specialized computing centers).
29. Please list and describe the information technology services that are provided centrally now that you believe NDSU no longer needs to support campus-wide and could be provided more effectively by individual units needing the service.
30. Conversely, please list and describe your top priorities for services that could be provided more efficiently and/or effectively if offered centrally by a campus-wide unit. Please also provide your criteria for effective service in each of these priority areas (Example service: servers purchased and maintained centrally that provide both Internet and local area network applications for campus units).
31. Please list and describe those information technology services that are now provided either by campus-wide unit or by an individual unit that might be done more effectively if they were outsourced (Example outsourced service: Student Email). Please include your reasons for these choices.

32. Please indicate whether you are a member of one of the following:
- IT Council
 - IT Council ITAG (information technology advisory group)
 - IT Tech Group
 - Telephone Administrator
 - IT Communication Liaison
 - Student Technology Fee Committee
 - Other (please list)

APPENDIX C. STUDY #1: 2009 SURVEY INVITATION LETTER

NDSU

NORTH DAKOTA STATE UNIVERSITY

701.231.5646
www.ndsu.edu/vpit

*Office of the Vice President for Information Technology
NDSU Dept. 4500
204 IACC
P.O. Box 6050
Fargo, ND 58108-6050*

A Letter of Invitation to NDSU Students, Faculty, and Staff

Funding the Technology of a Research University

Questionnaire Site: <http://thinktank.groupsystems.com/opinio/s?s=7109>

October 19, 2009

When I accepted this position as Vice President for Information Technology (IT), President Chapman asked me to determine the following:

- 1) the best organization for IT at NDSU; and
- 2) the total cost of IT at NDSU.

Due to the distributed nature of NDSU's IT environment, the answers to Dr. Chapman's questions are complex and difficult to answer. I am asking for your assistance in finding the answers to these questions.

After two years in this position, I am more convinced than ever that a distributed IT environment is a necessary component to NDSU's overall success. However, I recognized many years ago, when I was the Director of Information Technology Services, that the management of centralized IT functions (data security, calendaring, etc.) is very challenging within a distributed environment. In addition, our distributed nature makes it difficult to calculate the total cost of IT to the University, especially in salary-related expenses.

Realizing that I cannot answer these questions without you, I have asked Jean Ostrom-Blonigen, my Chief IT Planning Officer, to lead a project: 1) to study the provisioning of IT services at NDSU, 2) to calculate total campus IT costs, and 3) to identify current IT needs. Dr. Jeffery Gerst, Associate Vice President of IT & CIO, and Cloy Tobola, ITS Communications Coordinator, will work with Jean and each of you to find the answers to these questions. The group has received NDSU Institutional Review Board (IRB) approval (exempt project # HS08236) to conduct this research. Dr. Robert Littlefield, Jean's Ph.D. advisor, is the principal investigator on the project.

We have devised a multi-faceted questionnaire to assist the Division for IT as we continue our work to determine the best method or combination of methods to fund current and future technologies of North Dakota State University within an IT environment in which voice, data and video operations are both merging and emerging:

NDSU is an equal opportunity institution.

- 1) Gather campus IT needs, emergent themes, and cost data.
- 2) Use the information gathered to help identify the struggles and successes of processes within both our centralized and decentralized service levels, as well as any communication opportunities that exist within or because of our structures.
- 3) Finally, as this issue is not unique to NDSU, publish the findings.

As required with all IRB protocols, your participation is completely voluntary, and once you agree to participate, if at any time during the process you change your mind, you are free to discontinue your participation. If you have questions or concerns about the study, please contact Jean (jean.ostrom-blonigen@ndsu.edu or 1-5485) or the IRB office (ndsu.irb@ndsu.edu or 1-8908 or 1-8995).

The process has already begun by gathering responses and feedback from a pilot group familiar with our Division, the IT Council and its subcommittees, the ITAGs. Their suggestions for change have been incorporated into the questionnaire whenever possible.

The questionnaire, which takes about 20 minutes to complete, asks typical demographical questions, including information about IT security; examines the nature and extent of your IT work; seeks salary data; and asks for input related to IT services. The questionnaire will be open until 2:00 p.m. on Thursday, November 5, 2009. I ask that if you wear more than one hat (eg: member of the IT Council and member of the distributed IT community) that you respond from both viewpoints. Once the information is collected, we will work to categorize it. Once categorized, we will share the information with each of you.

At the October 5, 2008, meeting of the President's Cabinet, the President and other vice presidents were informed that in order to determine IT cost-related statistics by division, the following additional demographics would be collected for NDSU's distributed IT faculty and staff:

- Identification of division of employment (Academic Affairs, Agriculture, etc.),
- IT duties,
- Percentage of time spent on IT duties, and
- Salary range.

Thank you for your participation. Your input is of great value to the success of this project.

Sincerely,



Bonnie Neas
Vice President for Information Technology

**APPENDIX D. FIRST EMAIL NOTICE OF CONDITIONAL ACCEPTANCE TO
PRESENT AT 2009 EDUCAUSE MIDWEST REGIONAL CONFERENCE**

November 17, 2008 (11:09 am)

Dear Jean,

You may have already heard from my EDUCAUSE colleague Lida Larsen regarding your proposal for the Midwest Regional Conference program committee. If you have not yet, you will shortly.

Your proposal “Funding the Technology of a Research University” has been accepted with some special conditions. Please stand by to receive an official confirmation from me. If you have any questions now, please do ask.

Sincerely,

Jennifer Matney
EDUCAUSE Speaker Liaison

**APPENDIX E. SECOND EMAIL NOTICE OF CONDITIONAL ACCEPTANCE TO
PRESENT AT 2009 EDUCAUSE MIDWEST REGIONAL CONFERENCE**

December 2, 2008 (10:59am)

Dear Jean Ostrom-Blonigen and Ronald Roeber

You may recall that you received a conditional acceptance of your proposals for the 2009 EDUCAUSE Midwest Regional Program. The special condition is that the committee would like to have the two of you merge your proposals into a single presentation. We find that the attendees appreciate the opportunity to hear and contrast different viewpoints and perspectives on similar topics.

Jean's is on "Funding the Technology of a Research University" and Ronald's is on "Engaging Campus Users and Stakeholders in a Campus-wide IT Services Review"

The slot currently scheduled for this merged presentation is 11:45-12:30, right before lunch, on the middle day, March 24th.

Please confer with each other and confirm by Friday, Dec 12th, if you will be able to merge your presentations. If so, it would be helpful to have a new title and abstract by Dec 19th.

Contact Information

Jean Ostrom-Blonigen, North Dakota State University
jean.ostrom-blonigen@ndsu.edu
(701) 231-5485

Ronald Roeber, University of Nebraska, Lincoln
rroeber1@unl.edu
(402) 472-3751

Thank you
Lida L. Larsen
Regional Program Coordinator
Professional Development
EDUCAUSE
Phone: 412.361.3760
E-mail: llarsen@educause.edu

APPENDIX F. STUDY #2: 2011 IRB APPROVAL LETTER

NDSU

NORTH DAKOTA STATE UNIVERSITY

Institutional Review Board

*Office of the Vice President for Research, Creative Activities and Technology Transfer
NDSU Dept. 4000
1735 NDSU Research Park Drive
Research 1, P.O. Box 6050
Fargo, ND 58108-6050*

701.231.8995

Fax 701.231.8098

Federalwide Assurance #FWA00002439
Expires April 24, 2011

Robert Littlefield
Dept. of Communication
202 Ehly

Wednesday, September 28, 2011

IRB Certification of Human Research Project:

"Funding the Technology of a Research University" **Protocol #:** HS12053

Co-investigator(s) and research team: Jean Ostrom-Blonigen, Cloy Tobola, Kim Owen

Study site(s): NDSU

Funding: n/a

It has been determined that this human subjects research project qualifies for exempt status (category # 2b) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*).

Please also note the following:

- This determination of exemption expires 3 years from this date. If you wish to continue the research after 9/27/2014, the IRB must re-certify the protocol prior to this date.
- The project must be conducted as described in the approved protocol. If you wish to make changes, pre-approval is to be obtained from the IRB, unless the changes are necessary to eliminate an apparent immediate hazard to subjects. A *Protocol Amendment Request Form* is available on the IRB website.
- Prompt, written notification must be made to the IRB of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Any significant new findings that may affect the risks and benefits to participation will be reported in writing to the participants and the IRB.
- Research records may be subject to a random or directed audit at any time to verify compliance with IRB policies.

Thank you for complying with NDSU IRB procedures; best wishes for success with your project.

Sincerely,


Teri Grosz, CIP, Manager
Human Research Protection Program

NDSU is an equal opportunity institution.

APPENDIX G. STUDY #2: 2011 INTERVIEWEE INVITATION LETTER

NDSU

NORTH DAKOTA STATE UNIVERSITY

701.231.5646
www.ndsu.edu/cpi

*Office of the Vice President for Information Technology
NDSU Dept. 4500
204 IACC
P.O. Box 6050
Fargo, ND 58108-6050*

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- Identification of division of employment (Academic Affairs, Agriculture, etc.),
- IT duties,
- Percentage of time spent on IT duties, and
- Salary range.

Thank you for your participation. Your input is of great value to the success of this project.

Sincerely,



Bonnie Neas
Vice President for Information Technology

APPENDIX H. STUDY #2: INTERVIEW SCRIPT

Before we begin the interview, I will take a few minutes to review the IRB protocol with you and to describe the process that we will follow for your recorded interview. At this point, I started the recorder and continued as follows:

- For all interviewees: *Although you received the IRB protocol in your email invitation, I would like to review it with you before we begin.*
 - *Are you aware that your participation in this study is voluntary? (Yes or No).*
 - *Are you aware that once the interview begins, you may stop it at any time? (Yes or No; none of the interviewees stopped their interview early.)*
 - *Are you aware that although I will do everything in my power to separate you from your comments as I transcribe this interview, there is a chance that you might be identified from your comments? (Yes or No).*
 - *Is the risk of such an event too great for you to continue? (Only asked if the answer to the question above is “No”).*
 - *Having reviewed the IRB protocol, do you wish to continue with the interview?*

- For the CITU department heads: *As you know, at the president's request, the vice president and I have been working on this study to determine IT organization and costs at NDSU. You should know that I also plan to use a portion of the data in these studies for my doctoral dissertation. Thank you for agreeing to participate.*
- For the Round 2 interviewees: *I will take a few moments to describe how you came to be invited by the CITU vice president to participate in this study. Following their interviews, each of the three CITU department heads named three potential interviewees, for a total of nine potential interviewees; you are one of those nine. When CITU was formed the president asked the vice president to determine IT organization and costs at NDSU. Although I have been assisting the vice president with that work, I also plan to use a portion of the data collected in their interview for my doctoral dissertation. Thank you for agreeing to participate in this study.*
- For the Round 3 interviewees: *I will take a few moments to describe how you came to be invited by the CITU vice president to participate in this study. Following their interviews, each of the three CITU department heads named three potential interviewees, for a total of nine potential interviewees.*

Those nine interviewees in turn each named three potential interviewees. At the conclusion of those second round interviews; you were named as a potential third round interviewee. When CITU was formed the NDSU president asked the vice president to determine IT organization and costs at NDSU. Although I have been assisting her with that work, I also plan to use a portion of the data collected in this study for my doctoral dissertation. Thank you for agreeing to participate in this study.

- I then continued with the following script for all interviewees:

Please share with me your perception(s) regarding CITU. To clarify, I ask that you follow up your response by providing an example that illustrates your perception(s). Whenever there was silence, I would ask: Do you have anything more to add?