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Information Systems Scholarship: An Examination of the Past, Present, and Future of the Information Systems Academic Discipline

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INFORMATION SYSTEMS SCHOLARSHIP: AN EXAMINATION OF THE PAST, PRESENT, AND FUTURE OF THE INFORMATION SYSTEMS ACADEMIC DISCIPLINE

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If I speak in the tongues of men or of angels, but do not have love, I am only a resounding gong or a clanging cymbal. If I have the gift of prophecy and can fathom all mysteries and all knowledge, and if I have a faith that can move mountains, but do not have love, I am nothing. If I give all I possess to the poor and give over my body to hardship that I may boast, but do not have love, I gain nothing.

1 Corinthians 13:1-3

With Love,

For Missy and James

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how impactful a supportive family is to one's success in life. Thanks to you all for always believing in me!

And to save the best for last…thank you to my wife, Missy. You have been such an understanding and supportive spouse during this journey. I am so blessed to have you in my life. You are truly an amazing wife and mother to our son whose smile alone puts everything else into context. I love you!

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ABSTRACT

This dissertation investigates the topic of scholarship in the Information Systems (IS) discipline through a series of three papers. The papers, presented in Chapters 2, 3, and 4, each delve into a specific chronological period of IS scholarship which are delineated into the past, present, and future. Chapter 2 elucidates the IS discipline's 'past' by categorizing the entire corpus of extant research in the Association of Information Systems Senior Scholars' Basket of eight journals. Clusters derived from these mainstream journal publications represent a thematic identity of the IS discipline. After analyzing the corpus altogether, further analysis segments the corpus into shorter, 5-year periods to illuminate the historical evolution of the themes. Lastly, interpretations of the trends and a recommendation to curate an IS Body of Knowledge are discussed.

Chapter 3 surveys business school deans and IS academics eliciting their 'present' social representations of the IS discipline. It then seeks the two groups' feedback regarding their level of agreement with concerns attributed to the IS discipline as summarized in Ives and Adams (2012). Group responses are evaluated independently and are juxtaposed for between-group analysis. Then, additional concerns are gathered to ensure the full range of issues are represented. Network topic maps illustrate the findings, and interpretations are discussed. Group differences suggest that IS academics are more critical of the IS discipline than business school deans.

In Chapter 4, an alternative research approach is offered for conducting 'future' scholarship efforts in the IS discipline. A framework that organizes discourse on the emergent *crowdsourced research genre* is constructed. Prior to building the framework, a crowdsourcing process model is developed to conceptualize how problems and outcomes interact with the

crowdsourcing process. The internal process components include task, governance, people, and technology. Then, the crowdsourcing process model is applied to eight general research process phases beginning with the idea generation phase and concluding with the apply results phase. Implementation of the crowdsourced research framework expounds phase-specific implications as well as other ubiquitous implications of the research process. The findings are discussed, and future directions for the IS crowd are suggested.

KEYWORDS

Information Systems research, Information Systems themes, Information Systems discipline, Information Systems identity crisis, scholarship, latent semantic analysis, cluster analysis, social representations analysis, disciplinary concerns, business school deans, Information Systems academics, crowdsourcing, research framework, alternative genre

CHAPTER 1. INTRODUCTION

> *It is my belief that information systems present an unrivaled capacity to enhance decision making at all levels from simple individual tasks to complex global challenges. In the large-scale context, the application of information systems to collaboratively achieve societal good is still in its nascence; therefore, our collective understanding of its potential value is still widely unrecognized. While computerized information systems have tremendously impacted the last half-century, it is my firm belief that information systems technology will have an even more transformative influence on the next fifty years. This transformation will affect all segments of society. How we choose to engage in the coming technological advances will shape our lives either for better or worse.*
>
> *James Love*

The quote cited above is one that I recently wrote as part of my belief regarding the importance of information systems. It lends insight into my personal view of the powerful role that information systems will play in our lives in the years to come. It is no coincidence that my belief in the potential of information systems has lead me to a professional career that has been primarily devoted to furthering the advancement of them and now pursuing a Ph.D. in the Information Systems (IS) discipline.

While I have maintained a long-held belief that information systems will have tremendous influences on our lives, my understanding of the IS scholarship has taken a number of turns since transitioning into the role of a doctoral student. Over the past few years, my interest in IS scholarship has lead me to many pursuits, most recently culminating in this dissertation. The central topic of this dissertation is 'Information Systems scholarship', so allow me first to clearly introduce what that means. Merriam-Webster defines *scholarship* as "*serious formal study or research of a subject.*" This dissertation specifically concentrates on research performed by the community of IS scholars. What is IS? That turns out to be a much trickier question to answer. Unfortunately, the IS scholars themselves believe that the discipline suffers

from an 'identity crisis'. The 'identity' issue has been well documented in IS literature (cf. Agarwal & Lucas, 2005; Benbasat & Zmud, 2003; Galliers, 2003; Hirschheim & Klein, 2003). The lack of identity has stuck with the IS discipline in spite of early efforts by researchers construct conceptual frameworks to structure the discipline (cf. Gorry & Scott Morton, 1971; Chervany et al, 1972; Lucas, 1973; Mason & Mitroff, 1973; Mock, 1973; Jenkins, 1977; Ives et al., 1980). One possible contributing factor is the discipline's *diversity* in terms of methods, approaches, and thematic topics (Benbasat & Weber, 1996; Swanson & Ramiller, 2003). Benbasat & Zmud (2003) laments that IS researchers have broadened their scope of inquiry and suggests that researcher refocus their efforts on the 'IT artifact' which they conclude is the core of the IS discipline.

Banville & Landry (1989) suggests that the IS discipline is a 'fragmented adhocracy' because of the latitude attributed to IS researchers in terms of procedures and research questions. Their assessment reinforces the widely accepted notion that IS is a diverse discipline, yet they did not view it as a cause for disciplinary strife. However, Hirschheim and Klein (2003) contends the fragmentation is a root cause of the identity crisis. Ultimately, debates have continued on without clear resolution. Recently, IS scholars have shown an increased interest in the history of the IS discipline to increase our shared understanding of it (cf. Hirschheim & Klein, 2012). That motivation serves as the impetus for this dissertation.

Perhaps the aforementioned confusion about IS bubbling from within the IS scholarly community explains why Merriam-Webster's dictionary does not have a definition for *information system*! Actually, many definitions of IS have been offered, but the concept is often not well understood. By extension, the academic discipline that studies phenomena associated

with information systems also suffers from a clear, universally-accepted agreement of its domain and internal composition.

For now, consider the following conceptualization of an *information system* borrowed from Gray (2006) as a starting point:

> *An information system is a combination of technology, people, and processes to capture, transmit, store, retrieve, manipulate, and display information.*

Therefore, this dissertation is focused on the research efforts of those studying a combination of technology, people, and process for the purpose of capturing, transmitting, storing, retrieving, manipulating, or displaying information. More specifically, this dissertation examines the past efforts, present perceptions, and future opportunities of the IS academic discipline.

Admittedly, this dissertation is as much a personal exercise in self-discovery as it is a pure attempt to untangle the woes of an academic discipline. To be candid, I was completely unaware of the so-called 'IS identity crisis' prior to reentering academia as an aspiring Ph.D. student. This was in spite of the fact that I have considered myself a member of the IS community since I selected the BIS major as a sophomore undergrad. Since then, I earned undergraduate and master's degrees in Information Systems and subsequently worked in multiple university IS departments. Yet, it was only when I began studying the history of the IS academic discipline that I became aware of the looming crisis that plagued my beloved discipline!

One specific conversation in a Friday morning seminar was particularly unsettling for me. During the discussion about history of the discipline, it occurred to me that a number of the Ph.D. students around me had quite different perspectives from mine about what 'Information Systems' is and is not. Moreover, some students had a difficult time articulating a definition of the discipline. This left me contemplating, if IS Ph.D. students are struggling to find a common

answer to this seemingly simple question, what must everyone else not as intimately involved with IS think of it?

I do not mean to interject my personal story into this discussion out of blatant egotism. Rather, I have decided to share it because I believe that this experience is common to the experience many other burgeoning IS scholars face. In the early stages of Ph.D. programs, it is commonplace for doctoral students to receive clichéd advice such as "find a research niche within the field quickly and stay within it." Also, at some point most IS researchers are met head-on with the question, "Is that really IS research you are doing?" That can be a crippling question! But over time, I have come to realize that it can also be a loaded question because the answer solely rests on what is considered *authentic* IS research.

This dissertation is motivated to serve as a foundation for young IS scholars who seek an understanding of the IS discipline's diverse composition. It is also available for other IS scholars, humbled enough to recognize that their perceptions of the discipline are merely individual viewpoints collectively adding to the broader social construction of the IS phenomenon. Through reflective study, it is my hope that the IS community can overcome our identity issues and become the envy of other disciplines.

This dissertation is a collection of three papers that collectively canvasses the past, present, and future of scholarship in the Information Systems discipline. While each chapter can be read independently to examine the phenomena targeted by its research question(s), the overarching thesis spanning this dissertation is that by strengthening our collective understanding of the IS discipline's historical traditions and current perceptions, IS scholars will be better positioned to positively impact the discipline's future. In this spirit, the dissertation advances a vision for an alternative research genre for the future of IS scholarship.

The papers are presented in Chapters 2, 3, and 4 of this dissertation. Chapter 2 analyzes the 'past' achievements in IS scholarship. Through a review of mainstream IS research articles, Chapter 2 illuminates the thematic components IS researchers have studied during the past forty years. Article metadata such as the titles, keywords, and abstracts is collected for the entire corpus of articles published in the Association of Information Systems Senior Scholars' Basket of Eight Journals. Then, a data analytic technique, known as latent semantic analysis, transforms the massive collection of textual data into meaningful clusters based on the similarity of the research articles. These clusters reveal the thematic sub-components that comprise the IS discipline.

Further analysis breaks the article metadata into smaller, 5-year periods to demonstrate how the themes have changed over time. The findings are presented to exhibit the thematic nature of IS scholarship according to the discipline's top-tier mainstream journals. They illustrate how the IS discipline has grown and evolved in terms of research themes. The changing of IS research partially explains 'IS identity crisis' phenomenon and why clear representations of IS are so elusive. The chapter concludes by renewing previous calls for the IS scholarly community to curate an Information Systems Book of Knowledge that organizes the thematic structure of the discipline.

Chapter 3 moves forward to the 'present' in order to investigate current perceptions about the IS discipline. It particularly concentrates on social representations of IS academics and business school deans. In doing so, three central research questions are studied via an online survey. First, the respondents are queried regarding words or phrases that immediately come to mind when they think of the 'Information Systems discipline'. The participants replied by typing their responses into open text boxes that allowed for free-form answers. These results are

analyzed to elucidate responses to the following research question: *What social representations do IS Academics and Business School Deans currently make regarding the Information Systems discipline?*

Then, going beyond this initial investigation into how the IS discipline is perceived by these two stakeholder groups, two further research questions are posed to gain insight into the concerns these groups have about the IS discipline. First, the study surveys participants using recent commentary on the topic as a launching point. In the May 2012 issue of *DATA BASE*, Ives and Adams (2012) presented eleven key concerns for the IS discipline. The concerns noted in this article were a summarization of commentaries from four deans in that same May 2012 issue. From this starting point, IS academics and deans are asked to respond to the noted concerns in order to determine whether they are indeed representative of the broader voice of each community. Their level of agreement (or disagreement) is measured using a Likert-type scale for each of the 11 concerns posed in order to answer the following general research question: *To what extent do IS Academics and Business School Deans agree (or disagree) with Ives & Adam's (2012) summarization of IS concerns?*

Next, the study surveys participants by asking a follow up open-ended question to ensure concerns being voiced were not restricted to the predefined list. To this end, the following research question was presented: *What additional concerns do IS Academics and Business School Deans have about the IS discipline?* Since the question was presented in an open-ended format, participants could respond with a wider range of concerns that might not have been articulated in prior literature's summarization. The research questions are analyzed at the group-level to assess the broader social representations of each community. Then, a discussion addresses how the concerns compare between groups.

Chapter 3 finds that IS academics and deans maintain a number of overlapping views about the IS discipline. They also share some concerns and even have attached the concerns to their representations of the IS discipline itself. Chiefly among these findings is that the IS discipline is seen as ill-defined. This view is reinforced by other commonly held concerns regarding the discipline's alignment with other disciplines. In response to these views, Chapter 3 concludes with a recommendation that IS academics seek opportunities to work with other disciplines to create *relevant* research.

Chapter 4 pivots to cogitate the 'future' of IS scholarship. Its main purpose is to articulate a vision for an emerging genre to IS research referred to as the *crowdsourced research genre*. This research genre restructures the traditional production of IS research to harness the power of technology-mediated mass collaboration known as crowdsourcing. To guide the discourse, a *crowdsourced research framework* is constructed.

First, a *crowdsourcing process model* is developed to conceptualize the interactions within a crowdsourcing environment. This model follows the basic input-process-output (IPO) format. *Problems* and *outcomes* interact with the crowdsourcing process, and components internal to the process include: task, governance, people, and technology. The *crowdsourced research framework*'s construction is completed by intersecting the *crowdsourcing process model* with each of the eight phases in a *general research process*. These phases begin with the *idea generation* phase and continue through the *apply results* phase.

Chapter 4 details of each IS research process phase are discussed to illuminate the nascent *crowdsourced research genre's* possibilities and challenges. Findings from the implementation of the *crowdsourced research framework* shed light on phase-specific

characteristics as well as characteristics that persist throughout the research process. Following the discussion of these findings, future directions for the IS crowd are suggested

Chapter 5 concludes the dissertation with a summation of the studies contained in it. The IS discipline's historical evolution is highlighted and its status quo perceptions are reiterated. Then, the dissertation is completed with a challenge for future scholarship in the IS discipline.

CHAPTER 2. CAN REFLECTING ON IS HISTORY SOLVE THE IS IDENTITY CRISIS?: USING LATENT SEMANTIC ANALYSIS TO IDENTIFY THE EVOLUTION OF IS RESEARCH THEMES

ABSTRACT

This chapter portrays an identity of Information Systems (IS) scholarship that has been constructed during the past half century. Research themes that comprise the IS academic discipline are identified by reviewing the publication content from the AIS Senior Scholars' Basket of journals. After taking a holistic view to discern IS research thematics, a further investigation of research output is dissected into shorter 5-year periods that allows the historical evolution of IS discipline's themes to emerge. Interpretations of these trends are discussed.

INTRODUCTION

> *We also believe that a historical understanding makes us more appreciative of the situation in which we find ourselves today. And this insight – if applied to IS – could contribute to improving communication among diverse scholarly communities and to establishing a social identity for IS as a field…*
>
> *Hirschheim & Klein (2012)*

In the past half century, Information Systems (IS) scholarship has flourished growing IS from a research theme (Keen, 1980) into a diverse, pluralistic academic field in its own right (Banville & Landry, 1989; Klein & Hirschheim, 2008). The late 1960's spawned the first IS scholarly activity through research literature and academic programs (Dickson, 1981). The first academic IS program began in 1966 when Mississippi State University started offering a "business statistics and data processing" program (Hirschheim & Klein, 2012). In 1968, University of Minnesota established the first research center for MIS (cf. Dickson et al., 1977). Subsequent decades have brought about a maturing discipline characterized by its research diversity (Galliers, 2003; Lucas, 1999). However, the diverse nature of the IS discipline has not always been viewed in a positive light (Benbasat and Weber, 1996). It has been suggested as a

contributing factor to the IS discipline's "identity crisis" according to some IS scholars (cf. Nolan & Wetherbe, 1980; Benbasat & Zmud, 2003; Hirschheim & Klein, 2003, 2006). As scholars have attempted to articulate a definition of the field, debates have ensued regarding IS's conceptual boundaries and what, if anything, constitutes the core of the field (cf. Gray, 2003; Galliers, 2003; King & Lyytinen, 2006).

Even today, these concerns abound. Chapter 3 of this dissertation offers new findings that show current-day perspectives of people who know the IS discipline best believe *"the IS field is still ill-defined"*. Also, concerns about the *"focus of the discipline"* and its *"distinction from other disciplines"* are the most frequently expressed disciplinary issues today by IS academics and business school deans. These findings signal that IS academics and deans continue to be troubled by both the internal core composition and peripheral boundaries of the IS discipline.

Why does a clearly definable identity of IS remain elusive to the members of the IS research community after a half century? Perhaps more importantly, what can we do to solve this identity crisis? This study aims to help solve the question by illuminating IS research themes to further crystalize the research efforts of the past four decades into our collective memory. Agreeing with the Swanson & Ramiller (1993) assertion that research in academic journals exemplify a discipline's academic identity, this research empirically reviews mainstream IS literature to strengthen our shared understanding of the history of IS scholarship. Furthermore, an increased understanding of the gestalt of the IS discipline will better enable the systematic building of a cumulative research tradition (Keen, 1980).

The remainder of this chapter is organized as follows. A review of literature is presented to assess previous efforts focused on thematic clustering of the IS research literature. Then, the

research methodology applied in the present study is detailed. Results emerging from the classification are reported. Lastly, IS thematic trends from mainstream IS journals are discussed over time with consideration given to how these findings impact the lingering concern towards the IS discipline's sense of identity.

LITERATURE REVIEW

Since the IS discipline emerged from its reference disciplines, researchers have attempted to conceptualize the makeup of the discipline. In spite of these efforts, the IS discipline's identity remains elusive today. This review traces previous research that characterize IS academic literature in order to situate the present study with prior research activity. In doing so, the early efforts to create 'IS research frameworks' are discussed. This is followed by a review of other works that categorize IS research literature according to a variety of dimensions. Specifically, studies that generated research themes for the IS discipline are detailed.

Early IS Research Frameworks

The first attempts by IS researchers to identify the IS discipline's conceptual composition can be traced to contributions known as the 'IS research frameworks' (cf. Gorry & Scott Morton, 1971; Mock, 1973; Chervany et al, 1972; Lucas, 1973; Mason & Mitroff, 1973; Jenkins, 1977; Ives et al., 1980). These research frameworks were motivated to classify past and present research activity as well as to serve as a launching point for generating future research hypotheses (Ives et al., 1980). Furthermore, the frameworks were not only intended to assist researchers in pursuing a balanced research program, but also to help researchers communicate their work to MIS and non-MIS colleagues (Nolan & Wetherbe, 1980). An overview of the early MIS frameworks is presented in Table 1.

Table 1: Early IS Research Frameworks

Year/ Journal	Author(s)	Framework Categorization Structure	
1971 *Sloan Mgt. Review*	Gorry & Scott Morton	I. Levels of Managerial Activity 1. Operational Control 2. Management Control 3. Strategic Control	II. Relative degree of structure in the decision being made 1. Structured 2. Semi-structured 2. Unstructured
1973 *Database*	Mock	I. Individual/Psychological Variables 1. Attitudes-empathy, value structure, etc. 2. Intelligence, analytical skills 3. Universe of discourse 4. Learning skills and approach 5. Perception of organization goals, rewards, etc. 6. Motivation, hierarchy of needs 7. Probabilistic approach 8. Physical skills 9. Experience and education	II. Organizational, Interpersonal Variables 1. Formality of the information system 2. Organization/decision structure a. Planning, budgeting, control process b. Decision levels c. Management style (X, Y or Z) d. Norms, roles, etc. 3. Reward-punishment structure, performance measurement process
1972 *MISRC Working Paper*	Chervany, Dickson, & Kozar	I. Independent Variables 1. The Decision Maker a. Indirectly Acquired Attributes b. Directly Acquired Attributes 2. The Decision Environment a. Function (Finance, Production, Marketing, Personnel, R&D, etc.) b. Level (Strategic, Tactical) c. Environmental (Stability, Competitiveness, Time Pressure) 3. The Characteristics of the Information System a. Format (Content, Form, Presentation, Media) b. Time (Availability) c. Decision Aids	II. Dependent Variables 1. Decision Effectiveness a. Quality: (Cost, Profit, Time, etc.) III. Sociological and Environmental Variables 1. Culture 2. Legal system 3. Societal values 4. Political realities 5. Environmental complexity, noxity, eucity IV. Information Structure Variables 1. Coarseness and fineness 2. Content 3. Amount 4. Measurement scale 5. Reliability and validity 6. Net expected value V. Decision Maker Performance Variables

Table 1, continued.

Year/ Journal	Author(s)	Framework Categorization Structure
1973 *Mgt. Science*	Mason & Mitroff	I. Psychological Type 1. Thinking-Sensation 2. Thinking-Intuition 3. Feeling-Sensation 4. Feeling-Intuition II. Class of Problems 1. Structured a. Decisions under certainty b. Decisions under risk c. Decisions under uncertainty 2. Unstructured ("Wicked" Decision Problems) III. Method of Evidence Generation and Guarantor of Evidence-Inquiring Systems (IS) 1. Lockean IS (Data Based) 2. Leibnitzian IS (Model Based) 3. Kantian IS (Multiple Models) 4. Hegelian IS (Deadly Enemy-Conflicting Models) 5. Singerian-Churchmanian IS (Learning Systems) IV. Organizational Context or Organizational Class of Problem 1. Strategic planning 2. Management control 3. Operational control V. Modes of Presentation 1. Personalistic a. Drama-Role plays b. Art-Graphics c. One-to-One contact group interaction 2. Impersonalistic a. Company reports b. Abstract models-computerized information systems
1973 *Database*	Lucas	I. Quality of System II. Attitudes and Perceptions III. Situational and Personal Factors IV. Decision Style V. Use of Information System VI. Analysis, Action VII. Performance
1980 *Mgt. Science*	Ives, Hamilton, & Davis	I. Environment 1. External Environment 2. Organizational Environment 3. User Environment 4. IS Development Environment 5. IS Operations Environment II. Information System Processes 1. The Use Process 2. The Development Process 3. The Operation Process III. Information Subsystem 1. ISS Content 2. Presentation Form 3. Time of Presentation
1980 *MISQ*	Nolan & Wetherbe	I. Inputs 1. Resources 2. Information Requests 3. Data II. MIS Technology 1. Personnel 2. Procedures 3. Database 4. Software 5. Hardware III. Outputs 1. Decision Support 2. Programming Decisions 3. Information Reporting 4. Transaction Processing IV. MIS Feedback 1. Effectiveness 2. Efficiency V. MIS Environment 1. Psychosocial 2. Structural 3. Technical 4. Managerial 5. Goals and Values

Ives et al. (1980) reviewed the five previously published MIS research frameworks described in Table 1 and created a 'comprehensive' conceptual framework validated by mapping doctoral dissertations to it. This framework includes three *information system environment* variables, three *process* variables, and an *information subsystem* that fit with an *organizational environment* and the *external environment*. Five distinct research categories are derived from the Ives et al. (1980) model are shown in Figure 1.

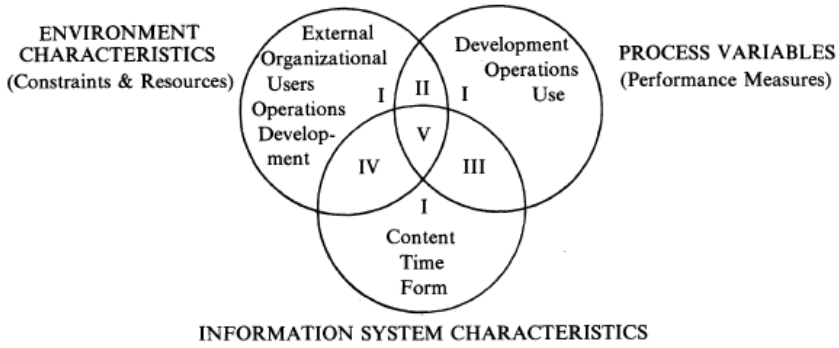


Figure 1: Ives et al. (1980) IS Research Categories

The first category of research, Type I, deals with a single variable group such as the *environment, process,* or *IS subsystem* groups. The second category, Type II, involves interactions between variables in the *environment* and *process* variable groups. Type III and Type IV similarly deal with interactions between two variable groups. They capture *process* and *IS subsystem* interactions and *organizational* and *IS subsystem* interactions respectively. The last category, Type V, is inclusive of research that examines relationships of variables in all three groups. These five research categories served as an early attempt at organizing IS research literature into groups; one that would be followed up by subsequent attempts to classify the work efforts of IS researchers in the following decades.

Classifications of IS Research Literature

In the time since the early IS research frameworks were published, additional works have continued the quest of capturing the essence of the IS discipline. These scholarly reviews take a variety of approaches to assess the work that has been performed as well as to suggest avenues for future research endeavors. The research efforts are often restricted to a limited focus. Typically, the reviews are confined to a single aspect that describes *how*, *where*, or *what* the previous studies performed.

Studies that spotlight the '*how*' aspect of IS research includes reviews of methodological choices and philosophical underpinnings. Van Horn (1973) identified four research methods used in MIS: case studies, field studies, field tests, and laboratory studies. Chen & Hirschheim (2004) found positivism represented the dominant paradigm being used in 81% of empirical articles. Furthermore, surveys and case studies were the leading IS research designs in the years sampled (1991 to 2001). Barkhi & Sheetz (2001) reviewed theories employed in 237 articles finding that about 50% cited a theory. Only 30 theories were cited in multiple articles illustrating the theoretical diversity in IS. Vessey, Ramesh, & Glass (2005) put forth that IS research adopted three general approaches (descriptive, evaluative, and formulative) and 18 distinct research methods.

A second area of convergence for IS reviews concentrates on '*where'* the research has been conducted or published. For example, researchers limited their scopes to only review IS research efforts in a specific geographic region such as Australia (Gable, 2008), Canada (Grant & Koop, 1995; Serenko, Cocosila, & Turel, 2008), China (Ji, Min, & Han, 2007a & 2007b), Europe (Avgerou, Siemer, & Bjorn-Andersen, 1999) and Scandinavia (Iivari & Lyytinen, 1999). Some reviews restricted their interest to where research was published (i.e., individual journals

or conferences). Examples include journal-specific studies published about *Information Systems Journal* (Avison et al., 2008), *Information & Management* (Palvia et al. 2007), and *European Journal of Information Systems* (Dwivedi et al., 2008). Gosain, Lee, & Im (1997) and Lee, Gosain, & Im (1999) compared topics in academic journals to the practitioner literature. Other publications compared journal output such as *EJIS* and *MISQ* (Cordoba, Pilkington, and Bernroider, 2012; Mustafee, 2011). Similar work was performed with conferences including Becker, Ibragimova, & Jones (2004) that assessed changes in mini-tracks at AMCIS over the preceding 10-year period.

A third stream of IS reviews honed in on '*what'* research topics comprise the IS field as a whole. Table 2 details published articles that created categories of research themes for the IS discipline sorted chronologically. These studies that categorized IS research in thematic groups often looked at the discipline as a whole; however, similar efforts also dissected the themes of individual IS-subfields such as knowledge management (Dwivedi et al., 2011), cloud computing (Yang & Tate, 2012), and NeuroIS (Dimoka, et al., 2012).

These reviews were motivated to serve many purposes. Barki et al. (1988, 1993) established and revised a classification scheme for *MISQ*. Culnan (1986, 1987) derived informal clusters of research to identify hidden intellectual communities within IS. Iivari et al. (2004) identified knowledge areas within IS to promote the establishment of an IS Body of Knowledge. Iivari et al. (2004) is distinct in that its overarching goal was to organize an IS framework relevant to practice rather than the IS research community. Vessey et al. (2005) sought to unify the fields of Computer Science and Software Engineering with IS. In doing so, the Vessey et al. (2005) review went beyond classifying the topic (i.e., research theme); it also presented a classification for dimensions such as research approach, method, unit of analysis, and reference

discipline. No other proposed classification system offered was as comprehensive in terms of dimensions covered. With the exception of Nevo et al. (2009) that created *themes* and *IT artifacts*, all other reviews presented a framework with a single dimension designed to classify research themes. The variations in terminology that researchers employed to reference thematic categories are listed in the Table 2 column describing the research 'Goal'.

Table 2: Publications Categorizing IS Research Themes

Year	**Author(s)**	**Journal**	**Goal**	**Years Reviewed/Categories of Findings**
1986	Culnan	*Mgt. Science*	Informal Clusters of Research	Years Reviewed: (1972-1982) Foundations/Management Theory, Systems Science, Computing Impacts/Local Government, MIS/DSS Implementation, Individual Differences, Human Factors, Computer Conferencing, and 2 unnamed.
1987	Culnan	*MISQ*	Informal Clusters of Research	Years Reviewed: (1980-1985) Same clusters as Culnan (1986)
1988	Barki, Rivard, & Talbot	*MISQ*	Keyword Classification Scheme	Years Reviewed: (1970-1987) Reference Disciplines, External Environment, *Technological Environment*, Organizational Environment, IS Management, IS Development and Operations, IS Usage, Information Systems, IS Education and Research
1993	Barki, Rivard, & Talbot	*MISQ*	(Updated) Keyword Classification Scheme	Years Reviewed: (1970-1992) Reference Disciplines, External Environment, *Information Technology*, Organizational Environment, IS Management, IS Development and Operations, IS Usage, Information Systems, IS Education and Research
1993	Swanson & Ramiller	*ISR*	IS Thematic Areas	Years Reviewed: (1987-1992) Computer-supported Cooperative Work Information and Interface; Decision Support and Knowledge-based Systems; Systems Projects; Evaluation and Control; Users; Economics and Strategy; Introduction and Impact; IS Research
2004	Banker & Kauffman	*Mgt. Science*	Research Streams	Years Reviewed: (1954-2003) Decision support and design science, Value of information, Human-computer systems design, IS organization and strategy, Economics of IS and IT
2004	Iivari, Hirschheim, & Klein	*ISJ*	IS Knowledge Areas	Years Reviewed: (1996-2000) Technical knowledge, Application domain knowledge, Organizational knowledge, IS application knowledge, and ISD process knowledge

Table 2, continued.

Year	Author(s)	Journal	Goal	Years Reviewed/Categories of Findings
2005	Vessey, Ramesh, & Glass	*I&ST*	Unified Classification System (for IS, CS, & SE)	Years Reviewed: (not applicable) Topic: 8 Top level topics including: Problem-solving concepts, Computer concepts, Systems/software concepts, Data/information concepts, Systems/software management concepts, Organizational concepts, societal concepts, Disciplinary concepts Approach: 3 Descriptive, 4 Evaluative, and 6 Formulative approaches Method: 19 methods Unit of Analysis: 10 levels Reference Discipline: 10 disciplines
2008	Larsen, Monarchi, Hovorka, & Bailey	*DSS*	Intellectual Communities	Years Reviewed: (1990-2002) Management Information Systems Research, Global and Societal Research, Human-Computer Interaction, Electronic Commerce, Systems and Software Engineering Research, Information Systems Storage and Retrieval Research, Knowledge-based Systems Research
2008	Sidorova, Evangelopoulos, Valacich, & Ramakrishnan	*MISQ*	Core Research Areas	Years Reviewed: (1985-2006) Five research areas: Information technology and organizations, IS development, IT and individuals, IT and markets, IT and groups. Thirteen research areas: IS development, IT management, Value of IT, IT adoption and use, IT and markets, IT for group support, Measurement instruments, IS discipline development, Decision support systems, HR issues in IS, Virtual collaboration, Project and risk management, and IT use by individuals.
2009	Nevo, Nevo, & Ein-Dor	*CAIS*	IS Themes & IT Artifacts	Years Reviewed: (1977-2006) Themes: Business Value & Strategic Impact of IT; Economics of IT; Ethics & Privacy; Individual/Group Performance & Decision Quality; Introspective Studies: IS Research and Identity; IS Success: IT Adoption, Resistance, Satisfaction, & Use; IT Professionals; IT-Based Innovation; IT-Driven Institutional Transformation; Knowledge & Information Management; Outsourcing & Governance of IT; Systems Design & HCI; IS Development Cycle: System Development, Implementation, Maintenance, Reliability, & Security IT Artifacts: Management Support Systems; Communications and Collaboration Tools; Inter-organizational Systems; Infrastructure Services; Enterprise Applications; Knowledge and Document Management Systems; Operational Systems; Resource Management Systems; Computer Integrated Manufacturing and Engineering; Consumer Website; Computer Graphics, Multiple IT Artifacts; Other

Table 2, continued.

Year	Author(s)	Journal	Goal	Years Reviewed/Categories of Findings
2012	Hirschheim & Klein	*JAIS*	Research Themes	Years Reviewed: (not reported) Era 1: Decision Support Systems, Human-Computer Interaction; Early Frameworks, Skeptics; Stages of Growth of IS; What is the real value of IS. Era 2: New Frameworks; Defining the field; Impact of IS Success; Competitive Advantage; IT & Organizational Change; IS in the public sector; Participative design. Era 3: IT productivity/economic performance; IT value; Technology acceptance; GDSS; Process-based view of IT implementation; Outsourcing; Aligning IT with Strategy. Era 4: Adoption of Internet/e-commerce; Globalization and cross-cultural studies; IT in developing countries; Virtual teams; Knowledge management; IT personnel; Business Intelligence; IS research productivity; Design Science; IS journal practices and ratings; New disciplinary frameworks; Discipline critiques

In summary, a stream of the IS literature exists that attempts to cluster the discipline into identifiable categories. These studies of IS scholarship all succumb to at least one of three shortcomings that the present study will overcome. First, previous research has not focused comprehensively on mainstream IS journals often choosing a more narrowed scope limited to one or two journals over an abbreviated 5 to 10 year timeframe. This study combats this weakness by including publications from all eight journals in the AIS Senior Scholars' basket (SSB8) over their entire publication history. Second, studies of IS themes generally neglect to capture the evolution of themes over time. Larsen et al. (2008) notes that future IS thematic research should take into account the evolution of the field and show how new research areas and communities have developed over time. Third, as the field is evolving, more current studies are required to incorporate into our understanding the thematic turns of the past decade. Most of the studies that compile our understanding of IS themes analyze research prior to 2002. With the exception of Nevo, Nevo, & Ein-Dor (2009), which reviewed the corpus of *Information Systems Research (ISR)* and *Management Information Systems Quarterly (MISQ)* through 2006, the most

recent review including the eight mainstream IS journals appears in Larsen et al. (2008) which includes 65 journals from 1990 to 2002. The present study bridges these gaps in IS literature by including articles from all SSB8 journals and elucidating the thematic trends over time in mainstream IS research.

RESEARCH METHODOLOGY

The data collected were analyzed using SAS Enterprise Miner 12.1 and TextMiner 12.1. Textual data analysis was performed using the latent categorization method described in guided by recommendations in Evangelopoulos, Zhang, and Prybutok (2012). This approach, referred to as latent semantic analysis (LSA), consists of the following five sequential processes: data selection, data preparation, artifacts weighting, numerical transformation, and statistical processing. The processes are performed in SAS Text Miner through the sequence of nodes shown in Figure 2. The following section details the methodological decisions made through each of the five processes of the data analysis.

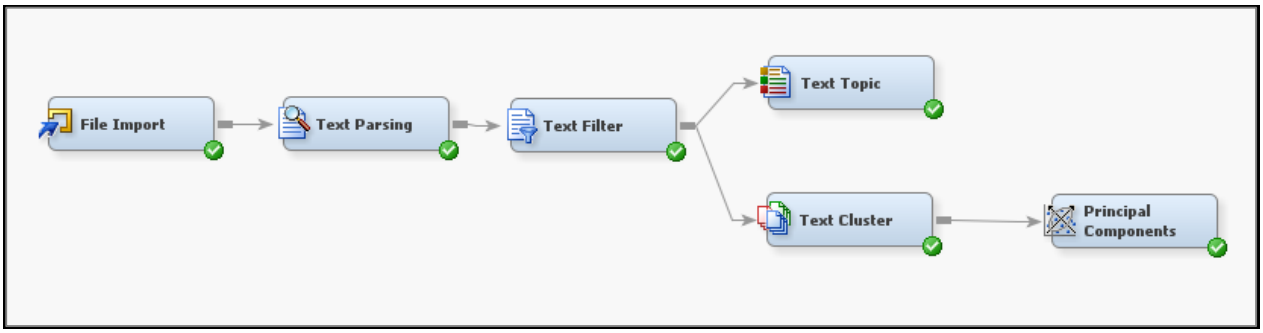


Figure 2: SAS TextMiner Data Analysis Process

Data Selection

The data analysis process was initiated by identifying a representative data source for the phenomena of interest. On December 6, 2011, the AIS senior scholars revised the 'basket' of eight journals (SSB8) they considered as the "top journals in our field" (SSB8). The impetus for creating the basket was so that it could ensure "more consistency and meaningfulness to tenure

and promotion cases". Since these eight journals represent the top mainstream IS journals according to leading IS scholars, this study included data from the entire collection of the articles in the SSB8 journals.

The whole population of articles was obtained for analysis; therefore, the goal of this research is not to generalize the findings from a sample to a target population. Rather, the aim is to reduce the large dataset into meaningful clusters representing the themes that naturally occur in the corpus of documents. The corpus of documents collected encompassed all research articles from the commencement of each journal through 2013. Metadata from each journal's offering of articles were collected through querying EBSCOHost Business Source Complete or from the journal's website directly. The specific data collected for each article includes the article's title, keywords, and abstract. Additionally, article publication data such as the year, volume, and issue were gathered in order to assess changes over time. In total, 5,458 articles comprised the corpus of documents collected. Table 3 provides a summary of the SSB8 journals publication history.

Table 3: Senior Scholars' Basket of Journals Publication Totals

Journal Title	**Journal Abbreviation**	**Publication Dates**	**Number of Publications**
European Journal of Information Systems	*EJIS*	1991-2013	725
Information Systems Journal	*ISJ*	1991-2013	407
Information Systems Research	*ISR*	1990-2013	650
Journal of the Association for Information Systems	*JAIS*	2000-2013	305
Journal of Information Technology	*JIT*	1986-2013	835
Journal of Management Information Systems	*JMIS*	1984-2013	1033
Journal of Strategic Information Systems	*JSIS*	1991-2013	439
Management Information Systems Quarterly	*MISQ*	1977-2013	1064
		Total:	5458

Documents excluded from this corpus include entries such as 'Errata', 'About the Authors', and 'Introductions' to issues that merely summarized the research articles in the respective issue. For the articles that were selected, all available data was collected. In some

cases, articles do not have keywords or abstracts associated with them. In these instances, the available text data were gathered to represent the article in the analysis.

The result of data selection process was combined into a file that consists of one article's data per row. The textual data containing the article title, article keywords, and article abstract were concatenated to allow for further processing to refine the dataset for analysis. The original dataset was comprised of 5,458 rows of articles (d) having a total over 566,000 distinct terms (t).

Data Preparation

The input dataset underwent a series of steps to refine the raw textual data into usable terms. First, words of little value in determining clusters were eliminated from the dataset. These words, commonly referred to as *stop words*, include many parts of speech such as articles, prepositions, and pronouns. Additionally, decisions were made to exclude other stop words that offered little help in discriminating journal articles into clusters of themes. For example, the term '*information systems*' appeared 9,978 times in the dataset, yet it was not valuable in discriminating whether a document should be assigned to a specific cluster over others since all clusters are sub-groups of the 'information systems' concept. Other examples include terms such as '*research'* and '*study*' which were two of the most frequently occurring words, yet were descriptive of the entire corpus of documents rather than any thematic sub-group of interest. The list of stop words is available in Appendix A.

Furthermore, words with multiple prefixes and suffixes were *stemmed* in order to consolidate the respective terms into a unified concept regardless of tense or whether plural or singular form occurred in the text. For example, the term '*organization'* appeared 882 times in its singular form, and 1,343 times as '*organizations*' in the plural form. Stemming this term allowed for these variations to combine into a single term.

Another feature of the SAS Text Miner software is that it allows for the creation of synonyms. After reviewing the dataset, judgments were made to overcome variations in spellings of terms such as '*organization'* and '*organisation'*. By designating them as synonyms, the software recognized them as a unified term. Altogether, the concept of an '*organization'* appeared 2,403 total times in the dataset. The software was sensitive to the contextual usage of the word with respect to the part of speech it appeared. For instance, variations of the verb '*organize*' appeared 132 times in the dataset; however, they rightfully coalesced into a concept independent from the aforementioned 'organization'.

The software also parsed whether a single-worded term was a part of a larger group of words such as '*enterprise resource planning'* or *'open source software'* creating *noun group* terms when appropriate. Lastly, when dealing with IT-related terms, it is imperative to be sensitive to the plethora of acronyms involved! To accommodate for this, synonyms were created linking acronyms such as *ERP*, *OSS*, and their ilk to their respective spelled-out word forms. Though this data preparation is quite time-consuming, the attention to detail is warranted as these modifications significantly impact the resultant clustering of topics.

The remaining terms that collectively characterize each document were then converted to a term-document matrix (A). This matrix consisted of rows (d) representing the documents (i.e., one journal article per row) and columns representing the unique terms (t) that appear in the corpus of documents. Each cell within the matrix (A) contained the frequency of occurrence for the term (t) in the respective document (d).

Artifact Weighting

Since the metadata in the journal articles, specifically the titles, keywords, and abstracts, vary in length, a weighting of terms was applied to correct for any overrepresentation of articles

with lengthy metadata. Several weighting techniques may be applied to account for the varying size of the artifacts. They primarily focus on the three aspects of the corpus. The first aspect, global effects, (*g),* measures the importance of the term throughout all of the documents. Second, the local effects, (*l*), describe the importance of the term within its respective document. Third, normalization, (*n*), of the documents adjusts the documents' length to become equal.

The two most common techniques for weighting are term-frequency inverse document frequency (TF-IDF) and entropy (Evangelopoulos et al., 2012). The recommended weighting is the TF-IDF technique when larger groups of terms are present in a complex semantic space (Evangelopoulos et al., 2012). TF-IDF determines the local weight, (l_{ij}), as the term's frequency (tf_{ij}). The global weight, (*g*), is calculated as the inverse document frequency ($idj_i = \log(nDocs/nDocs_i)$, where *nDocs* is the number of documents in the corpus, and $nDocs_i$ is the number of documents with term *i*. TF-IDF normalizes the length of all documents to 1 (Larsen & Monarchi, 2004). The result is a transformation of the original frequencies in each cell of matrix (A) to weighted ones as follows:

$$a_{ij} = tf_{ij} * \log(nDocs/nDocs_i)$$

For this study, Inverse document frequency (TF-IDF) was selected as the weighting scheme data analysis. This decision was guided by recommendations in Larsen & Monarchi (2004) and Evangelopoulos et al. (2012). Additionally, the choice was influenced by the desire to remain consistent with prior LSA studies in IS such as Larsen et al. (2008) and Sidorova et al. (2008) that both opted for the TF-IDF transformation approach.

Numeric Transformation

Since the matrix (A) is large and quite sparse possibly having less the 1% of the cells with non-zero values, a matrix operation known as singular value decomposition (SVD) was

utilized to reduce the size of the matrix. This separated matrix (A) into three matrices: (U), (S), and (V), where (U) and (V) were orthogonal matrices, and (S) was a diagonal matrix of (A)'s singular values in decreasing order. The matrix (U) contained (A)'s vectors that represented the rows of (A), and matrix (V) contained the vectors forming the columns of (A). Then, matrix (A) was reduced to an approximation matrix, (A_k), where k equaled the number of singular values included. At this point, the transformation of the original textual data into a numeric representation was complete. Additional detail on SVD is available in Sidorova et al. (2008)'s Appendix C.

Statistical Processing

Several post-LSA quantitative analysis methods have been used in literature to interpret the LSA results. This investigation compared results of cluster analysis and document classification analysis which are two commonly utilized techniques. Both techniques effectively perform a summarization of the corpus by creating categories of similar documents by relying on the SVD. These categories are also commonly referred to as groups or clusters, and they represent the IS research 'themes' in this study. The major distinction is that cluster analysis assigns each document (i.e., journal article's metadata) one category, whereas classification analysis potentially assigns a document to multiple.

In the cluster analysis, the specific method of measuring similarity relied upon here is the expectation-maximization clustering algorithm. It determined a maximum likelihood estimation for assigning documents to categories. The appropriate number of categories to create was decided upon as well. Proper dimensionality selection remains an unresolved methodological issue in research literature (Evangelopoulos et al., 2012), yet a number of suggested approaches were available to arrive at the appropriate number of clusters.

One approach is to evaluate the eigenvalues of the various component size options. A scree plot was utilized to observe eigenvalues plotted against principal components to visually inspect their shape. The point at which eigenvalues no longer dropped significantly produced an 'elbow' in the scree plot indicating the additional principal components explain little of the variance in the data. This point suggested a logical breakpoint for selecting the number of clusters to use in analysis. In the scree plot in Figure 3, it could be argued that elbows were present after the 4th, 10th, and 18th principal components.

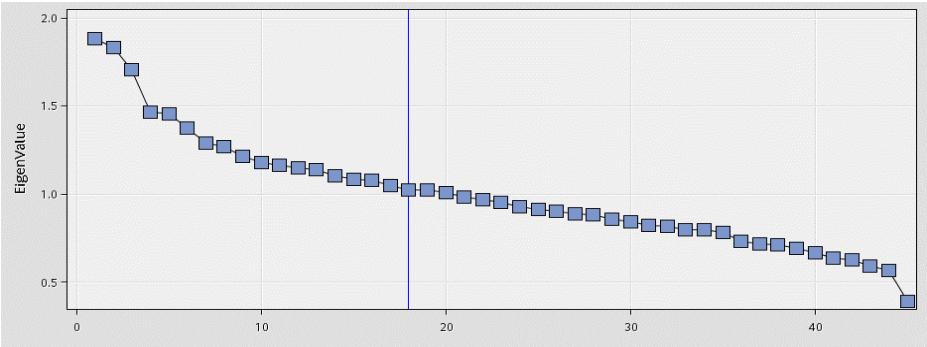


Figure 3: Scree Plot of IS Journal Metadata

Based on prior research (e.g., Sidorova et al., 2008) and analysis of their 7-cluster results, the decision was made to proceed with the higher (18-cluster) option to elicit more meaningful groupings for analyzing topic themes. The generated clusters were then interpreted to elicit meaningful, representative names for the categories.

In document classification analysis, documents are not restricted to being categorized by only one group. Rather, the categorical groups, referred to as 'topics', formed as a collection of terms describe a theme. A score was assigned to each term and document to describe how well they fit with each topic. If their association passed the minimum threshold, the term or document was considered to belong to the topic. Therefore, terms and documents could belong to multiple

topics or none at all. In this study, unsupervised classification analysis was performed since categories were not specified a priori.

Previous research on IS topic themes has generated multiple category sizes. For example, Sidorova et al., (2008) chose sizes ranging from 3 to 13, and 100. While arguments could be made to constrain the number of topics to various sizes, this study restricted the classification analysis to 18 topics to remain consistent with the cluster analysis's document segmentation.

FINDINGS

Themes in AIS Senior Scholars' Basket of Journals

Cluster analysis of the complete dataset of SSB8 journal articles for all years, (1977-2013), generates the 18 thematic clusters shown in Table 4. The largest thematic cluster only makes up 12% of the overall articles published; moreover, the five largest clusters only comprise roughly one-half (52%) of the total publications. Overall, these findings reveal a diverse literature base in terms of thematic orientation. This wide dispersion of articles across themes exhibits the willingness of the discipline's top mainstream journals to allow a variety of IS topics to flourish over the IS discipline's nearly 50 year history.

The cluster analysis findings reveal that IS development activities are the primary area of focus for SSB8 journal publications. Activities that occur over the IS development lifecycle include the *Strategy* (6%), *Implementation/Value/Performance* (12%), and *Adoption/Innovation Diffusion* (3%). Furthermore, this broader area of IS development-related themes is specifically interested in the 'software' component of the information system as revealed by the *Software Development* theme accounting for 7% of the overall publications.

Table 4: Clusters of IS Research Themes (1977-2013)

1	Implementation/Value/Performance	12%
2	Projects/Management	11%
3	Methodology	11%
4	IT Communication	10%
5	IS Discipline	8%
6	Software Development	7%
7	Consumers: Service/Quality	7%
8	Strategy/Competitive Advantage	6%
9	Knowledge Management	6%
10	E-commerce	3%
11	Adoption/Innovation Diffusion	3%
12	Group Support Systems	3%
13	Electronic Markets	3%
14	Decision Support Systems	3%
15	Outsourcing	2%
16	Organizational Learning	2%
17	Virtual Teams	2%
18	Researcher Profiles	1%

A second finding from the cluster analysis is that many thematic clusters focus on usage aspects of information systems. For instance, themes such as *IT Communication* (10%), *Consumers: Service/Quality* (7%), and *Adoption/Innovation Diffusion* (3%) are interested in users' interactions with information systems. Themes of *Projects/Management* (11%) and *Implementation/Value/Performance* (12%) are both aligned with the IS development and IS usage areas as the clusters' applicability spans them both.

A third area several thematic clusters have in common is how they directly relate to how information systems are applied in organizations for improving operations such as *Knowledge Management* (6%), *Organizational Learning* (2%), *Decision Support Systems* (3%), *Group Support Systems* (3%), and *Virtual Teams* (2%). Alternatively, the *Outsourcing* (2%), *E-commerce* (3%) and *Electronic Markets* (3%) themes all demonstrate how information systems research at times extends beyond traditional organizational boundaries.

The remaining IS research themes can be considered 'meta-research' themes. Research on *Methodology* (11%), *IS Discipline* (8%), and *Researcher Profiles* (1%) are primarily geared

towards the IS researcher community itself. The current study, about trends in IS research thematics, is a prime example of this area of IS scholarship. Specifically, the current study best aligns with the *IS Discipline* thematic cluster as it primarily focuses on identifying the sub-structure of the discipline.

Comparison of Cluster and Classification Analysis Results

While cluster analysis of the journal publication metadata produced 18 clusters of IS research theme present in the SSB8 journals, the technique has been criticized for its limitation of only assigning articles to one cluster each. For this reason, findings from the cluster analysis are compared to a classification analysis that was performed by assigning articles into 18 topic groups as well. The classification analysis technique accommodates for the assignment of an article simultaneously to multiple clusters, so more than one theme is represented if applicable. Table 5 provides a comparison of the classification analysis and cluster analysis results for the SSB8 journals over their entire publication history. Detailed findings for the cluster analysis and the classification analysis can be found in Appendix B and Appendix C, respectively.

When comparing results of the two analytic techniques, 17 of the 18 classification analysis groups are clearly represented by a cluster in the cluster analysis. One classification group that did not match strongly is the *Social Network* theme which clustered into a more generalized *IT Communication* group. Another complexity noted in the analytical comparison is that two classification groups, *Electronic Markets/Supply Chain* and *Online Markets*, both map to the same cluster analysis theme of *Electronic Markets.* Furthermore, the *Online Markets* classification group also contains commonalities to the *E-commerce* cluster. One other instance that techniques do not map one-to-one occurs with the *Knowledge Management* classification group corresponding to both the *Knowledge Management* and *Organizational Learning* clusters.

A final discrepancy is that the *IS Discipline* group emerged from the cluster analysis, yet it did not coalesce in the classification analysis. Common sense suggests that a theme including papers about the *IS Discipline* such as the present one does exist. This distinction and the aforementioned complexities exemplify the subtle influences that the two techniques present.

With either analytical technique, the overwhelming majority of groupings are clearly represented. For this reason, neither technique significantly outperforms the other for purposes of this study. While the two analytical techniques produce highly reconcilable thematic groupings, a more granular investigation into segmented publication time periods is necessary to reveal IS themes that have flourished during the discipline's history.

A prerequisite to eliciting themes over time is the determination of an appropriate length of time for the segmented periods. The selected choice breaks the 37-year publication history into 7 periods that are five years long splitting the decades. The first and last periods are exceptions. The first period combined years 1977-1979 into the early 1980s due to a small publication count, and the last period contains the four most recent years of data from 2010-2013.

The decision to segment the dataset into 5-year periods was based on a few key premises. First, the range of 4 to 8 segments is preferred for presenting findings graphically and is an appropriate size for discussion. A discourse on 37 distinct year-over-year changes would have been unwieldy! Seven 5-year periods spanning the early and late halves of each decade fit more appropriately. Also, the appropriate length of time for a theme to evolve was considered. Five years was deemed a sufficient period for thematic changes to occur. Lastly, the historical production rates of publications were considered to ensure clusters could be generated from the periods. The next section covers publication productivity in more detail.

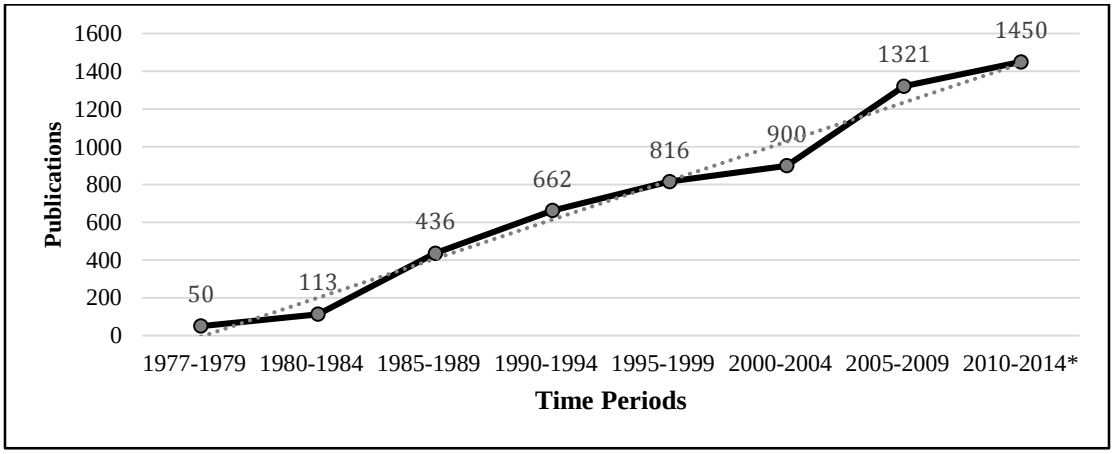
Table 5: Comparison of Overall Themes by Analytical Technique

Classification Analysis			**Cluster Analysis**	
ID	Theme Names		ID	Theme Names
3	IT Innovation/Adoption		9	Implementation/Value/Performance
1	Methodology		18	Projects/Management
6	Management		5	Methodology
2	User Adoption		12	IT Communication
9	Implementation/ERP		3	*IS Discipline*
13	Decision Support Systems		8	Software Development
18	Service/Quality		1	Consumers: Service/Quality
7	Strategy/Competitive/Planning		4	Strategy/Competitive Advantage
5	Performance/Investment/Value		15	Knowledge Management
11	Software Development		7	*E-commerce*
17	Social Network		17	Adoption/Innovation Diffusion
14	Knowledge Management		6	Group Support Systems
15	Electronic Market/Supply Chain		16	Electronic Markets
12	Outsourcing		2	Decision Support Systems
4	Online Markets		14	Outsourcing
8	Group Support Systems		10	Organizational Learning
16	Researcher Profile		13	Virtual Teams
10	Virtual Teams		11	Researcher Profile

Group Similarities	
Strong	
Moderate	
No Match	

Publication Counts in AIS Senior Scholars' Basket of Journals

Since *MISQ* began in 1977, the publication counts of IS discipline journal articles has consistently trended upward over the past four decades. The increases can partially be explained by the addition of new journal outlets over years such as *JMIS* and *JIT* in the mid-1980s along with *EJIS*, *ISJ*, *ISR*, and *JSIS* in 1990-1991. Additionally, the journals themselves have become more productive year-over-year. For example, *MISQ* published 15 and 18 articles in its first two years respectively. In the most recent two years reviewed (2012 & 2013), MISQ published 66 and 64 articles respectively. Figure 4 shows the increase in aggregated output by the SSB8 journals over their publication history.



*Estimation for 2010-2014 is based on 2010-2013 counts.

Figure 4: SSB8 Publication Count Increases Over Time

The changing landscape in terms of the production rate over the publication history is an important consideration when interpreting themes from the article metadata. Of the 5,458 articles published during the 37 year history of these journals, nearly half (49%) were published in the past 10 years alone (2004-2013). Knowing this, attention is next turned to analysis of publication content in smaller, 5-year periods to better isolate the thematic findings for the respective periods. In doing so, the changes in IS research focus measured by the volume of

published articles illuminate the evolution of scholarship in the IS discipline. The detailed findings from the cluster analysis of the 5-year periods can be found in Appendix D.

Thematic Trends in AIS Senior Scholars' Basket of Journals

In 1977, *MISQ* became the first mainstream IS journal publishing research that had previously been confined to journals in IS reference disciplines. From its inception through the end of the first research period in the mid-1980s, *MISQ* published research that centered on management-related issues regarding the creation and use of IS in organizations. Table 6 presents the trends in IS themes over time. Looking into the emergent IS research themes of this period, one sees that the literature base was tightly focused on a handful of topics. The themes concentrating on the major functions necessary to create an information systems infrastructure occupied the publication space such as *planning (9%)*, *design (20%)*, and *development (25%)*.

The period's other articles focused on information systems usage primarily in an organizational context. The two thematic areas of *data processing* and *decision support systems (DSS)* each comprised 23% of the articles published, amounting to almost half of the overall publication content of 1977-1984. Incidentally, the research on IS frameworks detailed in Table 1 was not represented in a cluster since most of it was not published in SSB8 journals.

The mid-1980s brought about the creation of the second and third IS mainstream journals with *JMIS* in 1984 and *JIT* in 1986. These additional two outlets upped IS journal publication rates surging nearly four times the total published in the prior 8-year period. A total of 436 articles were published from 1985-1989 up from 163 published from 1977-1984. Again, *IT development* continued as the dominant research theme garnering 49% of the journal articles.

Additionally, development-related themes of *planning, strategy, and success* accounted for another 17% of the journal space along with the more general *IT Management* theme

representing 8%. This increase in development-related themes came arguably at the expense of *DSS*-themed articles which dropped from 23% to only 10% of publication space in 1984-1989.

The rise of the importance of *databases* in IS literature is evident as that theme accounted for 17% of articles published in the late 1980's. At this time, IS literature evolved shifting its fascination to *database* research rather than its predecessor, *data processing* research. This transition signals the end of the *data processing* research stream.

The 1990's maintained the strong growth in publication output inherited from the previous decade. Four new journals started at this time, eventually doubling the IS discipline's collective production rate by the end of the decade as compared to the late 1980's. In 1990, *Information Systems Research (ISR)* began publication, and the following year *EJIS (European Journal of Information Systems)*, *Information Systems Journal (ISJ)*, and *Journal of Strategic Information Systems (JSIS)* started as well. These outlets brought not only a significant increase in publication space, but also additional themes previously unrepresented in IS research literature. While *development*-related functions still remained the discipline's primary research focus, a pronounced *'software' development* focus emerged accounting for 33% of the research articles. Also, strategy-related research soared in the publication period from 1990-1994 as seen by a new theme of *competitive advantage/strategy* (20%) in addition to *planning/strategic management* (8%) cluster.

In the early 1990s, *DSS* research also evolved to include the *group decision support systems (GDSS)*. This trend of refocusing from *DSS* to *GSS* continued over the subsequent two 5-year periods (1995-1999 & 2000-2004) as *GSS* research was published at 5% and 4%, respectively. However, the *GSS* theme dissipated as well by the late 2000s not having representation in the last two periods reviewed. The *DSS*- and *Database*-themed research

streams both lost ground in overall publication percentage to their position in the previous 5-year period during the late 1980's. Though the *DSS* theme's proportional representation dropped in the 1990s, the actual number *DSS* research articles published slightly increased. The increase, however, spawned new themes diluting the overall percentage of these two themes.

Several first-time clusters of IS themes emerged in the early 1990s. The cluster analysis formed nine clusters in the 1990-1994 period, up nearly double from the five clusters in the previous two periods. Notably, *user satisfaction* (6%) emerged as well as two new themes aimed at measuring information systems in terms of their *IT value* (6%) and *IT investment/evaluation* (5%). Furthermore, *Expert Knowledge* (6%) rose as an area of interest for exploration.

The late 1990's dominant thematic cluster investigated was *Organizational Change* (42%). This period also marked the first time that *methodological*-focused publications emerged into their own cluster. *Methodology* publications continued to receive much attention by journals in the years since. In periods 2000-2004 and 2005-2009, *methodology* articles were the highest grossing cluster at 14%. Their prevalence declined to 8% in the most recent time period measured (2010-2013). Two other clusters, *IS Discipline (5%)* and *Researcher Profiles (2%)*, in successive periods shared commonality with the *Methodology* theme insofar as they all specifically considered the scholarship of the IS academic community rather than phenomena in practice.

The *Outsourcing* (11%) research theme grew out of *strategy*-related research themes of the early 1990s while its predecessor, the *Planning/Strategy* cluster, declined from 8% to 5% over the two periods. Although *Outsourcing* was not represented in the subsequent 2000-2004 period, the theme reemerged, increasing in the two most recent periods (2005-2009 & 2010-2013).

Table 6: Changes in IS Research Themes Over Time

	1977-1984*		1985-1989		1990-1994		1995-1999	
1	Systems Development	25%	IT Development	49%	Software Development	33%	Organizational Change	42%
2	DSS	23%	Database	17%	Competitive Advantage/Strategy	20%	Methodology	12%
3	Data Processing	23%	Planning/Strategy/Success	17%	Planning/Strategic Mgt.	8%	Users	12%
4	MIS Design	20%	DSS	10%	User Satisfaction	7%	Outsourcing	11%
5	Planning	9%	IT Management	8%	DSS/GDSS	7%	IT Investment/Impact	7%
6					Database	6%	Project/Risk Management	5%
7					Expert Knowledge	6%	GSS	5%
8					IT Value	6%	Planning/Strategy	5%
9					IT Investment/Evaluation	5%		

	2000-2004		2005-2009		2010-2013	
1	Quality/Performance	14%	Methodology	14%	Use/Adoption	13%
2	IT Innovation/Adoption	14%	IT Implementation	12%	Project Management	9%
3	Methodology	14%	Bus. Value/Performance/Benefits	11%	Social Networks	9%
4	Implementation	11%	Acceptance/Adoption/Use	7%	Methodology	8%
5	Technology Acceptance Model	10%	Measuring Quality/Performance	7%	Online Markets: Product	6%
6	Project Teams	8%	Standards/Policy	6%	Outsourcing	6%
7	Knowledge Management	7%	Software Development	6%	Online Markets: Price	6%
8	Business Value/Investment	7%	Knowledge Management	6%	Performance	6%
9	Strategy/Competitive Advantage	6%	Virtual Teams	5%	Organizational Implementation/Change	6%
10	IS Discipline	5%	E-commerce: Consumer	4%	Communication Technology	5%
11	GSS	4%	Outsourcing	4%	Service/Quality	5%
12			E-commerce: Price	4%	Strategy/Competitive Advantage/Value	4%
13			Mobile/Innovation/Adoption	4%	Teams/Collaboration	4%
14			E-commerce: Trust	3%	Innovation/Adoption	4%
15			Government	3%	Virtual Worlds	3%
16			Researcher Profile	2%	Security/Compliance	3%
17			Security/Risk	2%	Privacy	2%
18					Supply Chain	2%

*Due to a small publication count (n) for the years 1977-1979 and 1980-1984, the two periods were combined into a single period.

In 2000, online publication of *Journal of the Association of Information Systems (JAIS)* commenced completing what is now the roster of SSB8 journals. The 5-year period of 2000-2004 demonstrated the further broadening of IS thematics in mainstream publications. The conceptual makeup of the IS discipline expanded forming 11 distinct clusters. The cluster analysis revealed the attention of IS scholars turned towards 'adoption' research as witnessed by the *IT Innovation/Adoption* (14%) and *Technology Acceptance Model* (10%) categories. The adoption themes prevailed in the 2005-2009 period as *Acceptance/Adoption/Use* (7%) and mobile-influenced category of *Mobile/Innovation/Adoption* (4%). Moreover, 'adoption' research was represented by two themes yet again in the 2010-2013 period. The *Use/Adoption* (13%) theme was the most prevalent research category in the most recent period, and *Innovation/ Adoption* research comprised 4% of the literature as well.

In the 2000-2004 period two other categories, *Quality/Performance* and the aforementioned *Methodology*, tied as the largest clusters with *IT Innovation/Adoption* at 14%. The notion of 'performance' subsequently endured in the 2005-2009 IS literature surfacing in the two categories of *Business Value/Performance/Benefits* (11%) and *Measuring Quality/ Performance* (7%). It then continued in the 2010-2013 period purely as *Performance* (6%).

Beginning in the 2000-2004 period, 'teams' surfaced as a topic of investigation. In that period, *'Project' Teams* drew 8% of the articles published. In 2005-2009, the focus shifted as *'Virtual' Teams* (5%) was the more indicative nomenclature for the cluster. In the most recent period, a slight change in focus was witnessed yet again as the category formed as *Teams/Collaboration* (4%). Also in the early 2000s, *Knowledge Management* (7%) first appeared as a cluster. The theme was preceded by the slightly similar concept of *Expert Knowledge* (6%) which formed a one-time cluster in the early 1990s. *Knowledge Management*

maintained its position throughout the latter half of the decade (at 12%), but the research theme disappeared in the 2010-2013 IS literature.

The most recent decade of IS research (periods 2005-2009 & 2010-2013) trended towards even more thematic diversity having 17 and 18 distinguishable clusters, respectively. Like the previous period, (2000-2004), the thematic diversity was present since no single thematic cluster accounted for more than 14% of the overall literature published. Moreover, no category other than the top theme of *Use/Adoption* (13%) was greater than 9% showing the diffusion of IS research themes continued.

In the 2005-2009 period, 'e-commerce' research gained recognition in IS mainstream research journals as three clusters formed representing different dimensions of the e-commerce concept. The 'e-commerce' theme was researched in the context of *Consumer* and *Price* both covered 4% of publications while *Trust* was the focus of another 3% of IS mainstream literature. The 'e-commerce' terminology did not have staying power in the cluster analysis though as the 2010-2013 period left it out altogether. Instead, two similar conceptualizations of *Online Markets: Product* (6%) and *Online Markets: Price* (6%) coalesced in the analysis.

Also in the 2005-2009 period, 'security' research debuted as a theme in IS mainstream journals as the *Security/Risk* (2%) cluster and continued via the *Security/Compliance* (3%) cluster in 2010-2013. Often associated with security, the theme of *Privacy* (2%) materialized in in the 2010-2013 period as well. Another new entrant in the most recent period reviewed was *Social Networks* (9%). The *Social Network* themed research category quickly vaulted to the second most covered IS research theme. This increased interest exhibited a notable surge since the theme had been not previously investigated enough to form a cluster. The inclusion of *Privacy*, *Social Networks*, and *Security*-related themes exemplified how the IS discipline grew

from a tight concentration of a few themes into the thematically diverse discipline of today. Collectively, these findings show that the number of components comprising the IS discipline's identity increased over time. This evolution towards greater thematic diversity was revealed through steady growth in topics along with a corresponding decrease in overall percentage maintained by the leading thematic clusters.

DISCUSSION

Evolving and Enduring Nature of IS Themes

As the community of IS researchers, the number of publication outlets, and the number of articles published have steadily increased over the past four decades, the number of IS themes has grown as well. These changes can perhaps be viewed as a positive growth in the discipline's composition. On the other hand, it is understandable to see how some have viewed this growth as evidence of an ill-defined discipline wandering about without a coherent core focal area. The IS discipline has grown to include a multitude of themes since its early days. While some themes have had seemingly short lifespans, others have withstood the test of time. Enduring themes align into five primary areas including: management, IS development, IS use, IS applications, and the meta-IS research areas.

Firstly, a significant subset of IS research has traditionally been dedicated to management functions such as *Planning*, *Strategy*, *Competitive Advantage*, *IT Investment*, and *Standards/Policy*. Moreover, a number of themes in this area explicitly mention 'management' in their name such as *IT Management, Project Management, Risk Management, and Knowledge Management.* While it may seem obvious that management-oriented publications are well represented since the first two SSB8 journals, *MISQ* and *JMIS*, contain 'management' in their name, the specific managerial aspects of interest have varied over the years. It is also

noteworthy that the discipline has grown larger than just covering managerial issues in the organizational context. Several of the themes in the past decade demonstrate the discipline's willingness to push the boundaries beyond the traditional focus of organizational issues from a managerial perspective. For example, themes such as *E-commerce: Price*, *Security/Risk, Government, Teams/Collaboration*, *Privacy,* and *Virtual Worlds* are certainly not limited to the organizational environment.

Next, two of the enduring thematic areas in IS research continue to unite around the *IS development process* and *IS use process*. It is noteworthy that these two are present in the Ives et al. (1980) framework. *Development*-related themes are consistently a top area of study in the IS discipline. The theme's monikers have varied over the years such as *Systems Development, IT Development,* and *Software Development*. Over time, this research stream's focus shifted to IS lifecycle's next phase: implementation. More recent periods refer to this work as (*IT* or *Organizational) Implementation* and representations of the more general notion of *Organizational Change* additionally refer to this area. The presence of these categories clearly conveys that the *IS development* process is a cornerstone of IS scholarship.

Use-related themes have also been a fixture in IS research from the early on with themes such as *Success, User Satisfaction*, *Quality,* and *Performance* appearing repeatedly. The 'use' process area consists of a multitude of clusters containing terms such as *Acceptance, Adoption, Innovation, Diffusion, Technology Acceptance Model (TAM),* and obviously *Use.* This area has maintained a prominent standing over the past three periods (from 2000-2013). Two categories reflect this area in 2000-2004 and 2005-2009, and *Use/Adoption* was the top category in the 2010-2013 period.

A fourth area of similar categories coalesces around IS applications. *Data Processing* and *Decision Support Systems (DSS)* are early examples of application-research. The *Group Decision Support Systems (GDSS)* and *Group Support Systems (GSS)* research variants exemplify the application-focused research as well. More recently, some examples include *Knowledge Management, E-commerce,* and *Social Networks.*

Lastly, a fifth enduring area is with what I have termed the meta-IS research area of the IS discipline. While this category did not form in the cluster analysis until the late 1990s, this research which includes publications about *Methodology, Research Profiles,* and issues about the *IS Discipline* are not likely a temporary fashion wave. As the IS community's interest in the discipline's history increases, these types of publications will continue.

Drivers of Thematic Evolution

From this analysis of the evolution in IS thematic trends, it is clear that a significant driver of change in the IS scholarship has been technology. This is illustrated by *Data Processing* research giving way to *Database* research and *DSS* research shifting towards GDSS research. It is also clear from the advent of research such as *E-commerce*, *Mobile* technologies, *Social Networks,* and *Virtual Worlds* that IS research trends often trail popular technological trends.

If IS scholarship indeed is influenced by popular technological advances, future themes the discipline may take on could include wearable technology, the Internet of things, personalized medicine, cryptocurrencies, and 3D printing to name a few. While these themes will have impacts in the organizational environment, the larger impacts of these impending technologies will likely take place in the individual and societal environments. The IS academic

community will ultimately decide whether these IT advancements are within the purview of IS research.

Perhaps it is not surprising that the clusters of IS disciplinary themes have not substantially evolved due to theoretical advances over the years. Certainly, the discipline has made strides within its various research themes due to theoretical progress; however, these advances are not widely reflected by the changes in the thematic clusters. The only cluster that formed around a theoretical model was the *Technology Acceptance Model* category in 2000-2004. This research stream thrived in subsequent periods as the *Acceptance/Adoption/Use* and *Use/Adoption* research clusters. However, other IS-native theories have not generated similar traction to spawn the accumulation of research necessary to form a thematic cluster.

Impact of Thematic Changes

The LSA technique used in this study captures the evolution of the IS discipline from its initial clusters until present day. The findings suggest the IS discipline is growing in thematic diversity and themes are evolving over time. For example, the theme of *Social Networks* jumped to 9% of the research articles published in the most recent period although it had never been previously represented. The evolutionary nature of the IS discipline's thematic structure obscures our ability to clarify the discipline's identity and portends that future work on the thematic composition of the IS discipline will be necessary.

A primary impact is that the ever-changing nature of the IS discipline likely contributes to the difficulty in articulating the essence of the discipline. While this applies amongst communications of members within the IS academic community, it also impedes our ability to promote the IS discipline to peers such as faculty inside and outside of the business school. Furthermore, it complicates how we market the discipline to business school administrators,

human resources employees, and future students. We should not visualize this implication negatively though. Rather, we should embrace the reality that our discipline is one that not only consists of enduring areas, but also is thriving in new emergent areas.

A second impact is that continued efforts to address the status quo will be required in the future. As mentioned, the *Social Networks* theme does not appear in this study's cluster analysis prior to 2010-2013 period. The theme, rightfully, did not appear in any of the previous classification frameworks covered in the literature review either. The current study does support these previous frameworks insofar as it reveals that *Social Networks* truly did not account for a significant portion of IS literature until the 2010-2013 time period. Yet, the inclusion of the *Social Networks* theme in the most recent period illustrates one example of how each of the previous classification frameworks are now outdated to some degree. Again, this impact calls for ongoing reviews in order to keep an accurate pulse of the disciplinary growth. To this end, I join in previous proposals for the IS community of scholars to curate an IS Body of Knowledge.

IS Body of Knowledge

The creation of an IS Body of Knowledge (ISBOK) has been offered as a tool to strengthen the IS researchers' collective sense of community (Hirschheim & Klein, 2003, 2012; Iivari et al., 2004). I support and renew these calls as a means of clarifying the identity of the IS discipline to those inside the field and others in related fields. Other fields have already established a Body of Knowledge. For example, Project Management's *PMBOK* was initially created in 1996, and its fifth edition is available as of 2013 (Project Management Institute). The PMBOK catalogues 47 processes into ten knowledge areas and five process groups. Similarly, Software Engineering's *SWEBOK* is currently in its third edition as of 2013 recognizing 15 knowledge areas within the field (Bourque & Fairley, 2014).

The findings of this study's cluster analysis illustrate how closely related Project Management and Software Engineering are to IS. In particular, IS's themes include *Project Management* and a number of themes similar to the knowledge areas within the *SWEBOK*. In light of this, my recommendation is to acknowledge existing bodies of knowledge, and clarify how they align with the *ISBOK's* contents. Furthermore, the *ISBOK* should incorporate IS research activities into the conceptual composition of IS. Other bodies of knowledge have not done this; however, the addition can serve to bridge the gap between academics and practitioners by illuminating their commonalities.

The ongoing curation of IS themes in the *ISBOK* could be carried out via crowdsourcing utilizing the power of the broader IS research community. The broader role of crowdsourcing in the context of IS research is examined in Chapter 4, so a more detailed illustration is available in that chapter. To summarize, however, the *ISBOK* could exist as a living artifact openly accessible and extensible to all interested researchers via the Internet. Concepts such as collective taxonomizing (Wu et al., 2010) would allow for the distribution of labor across the crowd of IS scholars. Furthermore, the IS literature corpus's categorization efforts should extend beyond the single dimension of research theme. A logical starting point is with the five dimensions noted in Vessey et al. (2005).

LIMITATIONS

Some inherent limitations exist in this study that are common to reviews of this type. First, the scope was constricted to the SSB8 journals. Output from niche journals can provide further insight into the scholarship of the IS community. The obvious difficulty involves the determination of the disciplinary boundaries. The decision to extend the scope past the SSB8 journals begs the question, "What journals should be included (or excluded) from a larger

scope?" The resulting answer would heavily impact the subsequent thematic clusters because many niche journals will only contribute publications to the single cluster defined by their niche. For this reason, the current study was confined to the top 8 journals that are deemed mainstream IS research outlets by AIS senior scholars.

Furthermore, accepted journal publications are only one indicator of IS scholarship. While it is arguably the best indicator of the overall accomplishment by the IS scholarly community, other indicators could additionally lend insight into the structure and evolution of IS scholarship. For example, tracks and presentations of IS academic conferences serve as representations of what the organizing scholars deem as appropriate IS scholarship areas.

Another form of scholarly values can be observed via IS course content. This content engenders what we believe are the important components of our discipline that students should master. Another source for future research is found within the descriptions of IS academic job announcements as well as researcher biographies. These two sources directly state what academics consider as important specializations within the IS discipline. The combination of these sources, and others not mentioned, will collectively improve our view of the IS discipline's true identity.

A final limitation is that IS research themes are evolving over time. This study should not be taken as the final, definitive insight into the discipline's identity. Rather, it is merely the next chapter of an ongoing phenomena. We should expect to see new themes emerge in the upcoming decades that are currently unrepresented. These new themes will perhaps grow the field, expanding its current composition. Alternatively, they might succeed current research streams as IS researchers pivot to new phenomena en lieu of the current themes. Whatever

direction scholarship of the discipline takes, its evolutionary nature will necessarily require future efforts to capture the latest trends.

CONCLUSION

In conclusion, this chapter has illuminated the thematic composition of Information Systems discipline that has been constructed over the past half century. The thematic clusters were elicited by reviewing the publication content from the top eight journals in mainstream IS literature. After taking a holistic view of the literature base, further investigation of research output was dissected into shorter 5-year periods allowing for historical evolution of IS disciplinary themes to emerge.

The data analytic technique of latent semantic analysis successfully abstracted meaningful clusters of information from the massive corpus of textual data. In doing so, enduring themes tied to the IS development process and IS use process are visible over the tenure of the discipline. The growth of the IS discipline in terms of journals, publication production, and themes is also evident from the analysis. This gives further credence to claims that IS is a diverse discipline. The evolutionary growth of the IS discipline also sheds light on why its identity has been a concern to members of the IS academic community as well.

While no individual study can singlehandedly solve the so-called IS identity crisis, efforts to distill the historical achievements of IS academics are invaluable contributions for building a shared understanding of the discipline. Future efforts to curate meta-data regarding IS research efforts are highly encouraged so our understanding stays current with ongoing trends in IS literature. In addition to thematic reviews such as this one, studies that elucidate the IS discipline's make up in areas such as paradigmatic and methodological underpinnings are warranted for further reflection on the true nature of IS scholarship.

This chapter offered insight into themes that IS scholars have investigated over the past four decades and their evolution up to present day. Next, Chapter 3 questions IS academics and business school deans about their present day perceptions of the IS discipline. What do they view the IS discipline as today? Also, what are their current concerns about the IS discipline? In the next chapter, these two stakeholder groups are surveyed to assess their social representations regarding the IS discipline and their concerns related to it.

CHAPTER 3. IDENTIFYING CURRENT SOCIAL REPRESENTATIONS OF THE IS DISCIPLINE AND IS CONCERNS

ABSTRACT

This chapter surveys business school deans and IS academics regarding their level of agreement with concerns attributed to the Information Systems discipline as summarized in Ives and Adams (2012). The responses of the two constituent groups are evaluated independently, then the responses are juxtaposed for between-group analysis. Additional concerns are elicited from the respective groups, and the social representations generated are reported per stakeholder group. Analysis is illustrated through network topic maps and discussed based on the authors' interpretations of the findings. The findings show marked differences between the groups suggesting that IS academics are more critical of the IS discipline than business school deans.

INTRODUCTION

> *The debate certainly won't be resolved with these papers or even after many more are published. Nonetheless, the discussion of issues such as the IS core are healthy for our profession because they help all of [us] understand the theoretical, philosophical, and practical aspects of the work we do.*
>
> *Paul Gray (2003)*

In light of the findings in the previous chapter, how do the present-day social representations from people closely involved with the discipline square with the historical representation just presented? Also, observing the debates in the IS academic discipline taking place over the years on multiple platforms, one wonders about the veracity of claims of alleged concerns that plague the IS field. Are these concerns shared throughout the IS academic community, or are they merely the clamoring of a vocal minority of IS scholars? Furthermore, are the concerns confined to an echo chamber within the walls of the IS academic community, or do they resonate with business school administrators as well?

Discussions about the state and future of the field have been presented in journal articles (e.g., Watson et al., 1999; Hirschheim and Klein, 2003; Gray, 2003; George, Valacich, and Valor, 2005; Grover, 2012; Gray, 2012; Ives & Adams, 2012; Ginzberg, 2012; Jessup, 2012; Tanniru, 2012, Todd, 2012), conference panel discussions (Firth, et al., 2010; Mooney, et al., 2012; Niederman, et al., 2012), and on Association for Information Systems' social networking websites (Alghawazzi, 2013; Darnton, 2013; Power, 2013). These discussions suggest there is a crisis in the field that needs to be addressed to secure the existence of IS as a single, united, and relevant body of knowledge. This is not purely an academic debate, even for academics, as evidenced by stand-alone IS departments disappearing from business schools and a reduction in available jobs for IS faculty.

While some may consider this preoccupation with defining the field as counter-productive, or at least excessive, it is my belief that this reflective examination is beneficial in multiple aspects. For starters, it ensures that students in IS programs gain a comprehensive understanding of the field. Furthermore, this examination is necessary so that we may better serve the business community by equipping graduates with the knowledge and skillsets that their diplomas indicate that they possess. This requires that we agree on what the IS discipline is as well as the opportunities and concerns facing the discipline.

To this end, in the May 2012 issue of the *DATA BASE*, Ives & Adams (2012) presented eleven key concerns for the IS discipline. Five of these concerns are directly connected to the "field's research agenda" (p.34). The remaining six concerns appear to be problems stemming from the perception of IS as an ill-defined and growing area of study. Proceeding from the commentary of Ives & Adams (2012), the perceptions of two groups of professionals whose work define the IS field are explored. The overarching goal of this study is to elicit perceptions

of the IS discipline and reveal concerns held toward it. Attention is specifically directed to views of two stakeholder groups, IS academics and business school deans. Comments are offered on these findings as a data-informed starting point for continuing discussion on these traditionally thorny issues.

This chapter is organized as follows. First, a brief review of research that has examined the IS discipline's foundations and domain is presented. Then, the details of the current research study are explained by structuring the study's contributions into three phases. Phase 1 depicts the groups' views towards the 'IS discipline'. Phase 2 assesses agreement of the groups with historically noted concerns appearing in IS literature. Phase 3 also investigates 'concerns of the IS discipline' to determine whether additional concerns exist. Each phase's findings are presented in three parts: IS academic group results, dean group results, and a between-group comparison of results. The chapter concludes by acknowledging contributions and the limitations of the study.

LITERATURE REVIEW

Over the course of the nearly fifty-year history of the IS discipline, the field has been represented in a variety of ways collectively contributing to the discipline's reputation. The field has grown in terms of both specializations of research focus and diversity of methodological techniques employed by researchers comprising the field. With these changes, however, questions have been levied challenging the field's need for existence, its conceptual core, and the relevancy of its research.

In the late 1990s, the IS field, in and of itself, became the focus of reflective questioning that was even as fundamental as to question whether the field should exist (Lucas, 1999; Markus, 1999). Adding to this, the IS domain was further criticized in the much publicized article "IT

Doesn't Matter" that asserts IT's strategic importance had diminished, therefore management should invest less in what was effectively seen as a commodity (Carr, 2003). Also, IS student demand began declining in 2002 (George et al., 2005). Considering alternatives, it has been suggested that IS departments be dissolved into other departments each specializing in IS relevant to their disciplines. Business school deans recommended IS academics collaborate with peers in other disciplines while recognizing that the other disciplines can be competitors also (Watson, Sousa, and Junglas, 2000). At AMCIS 2010, a panel discussion convened to address the "credibility crisis" continuing to face the IS discipline (Firth et al., 2010).

Another criticism, related to the field's conceptualization, is the questioning of what constitutes the core of the IS discipline, if one even exists. A *Communications of the AIS* special issue (Gray, 2003) collectively referred to as '*the core series*' covers a gamut of perspectives responding to Benbasat and Zmud's (2003) claim that IS research should concentrate on the IT artifact as the core of the research domain. Additionally, *Journal of the AIS* published responses to the Benbasat and Zmud (2003) article (DeSanctis, 2003; Galliers, 2003; Ives, Parks, Porra, and Silver, 2004; Lyytinen and King, 2004; Robey, 2003). In more recent years, continued debates have abounded (Agarwal and Lucas, 2005; Grover, 2012; Hassan, 2006; Klein and Hirschheim, 2006, 2008, Lyytinen and King, 2006; Weber, 2006) without a consensus emerging. Relevancy of IS research has been criticized coinciding with the debates pertaining to the field's existence and conceptualization of its core. The discourse within the IS community on research relevancy has similarities to the core debates in that a Benbasat and Zmud (1999) article precipitated a *Communications of the AIS* special issue (Gray, 2001). Furthermore, a subsequent panel discussion ensued at the ICIS 2001 (Kock, et al., 2002) where panelists portrayed IS researchers' quest for relevance ranging from a subtle accomplishment to an unfilled promise

and serial hypocrisy. One step the IS research community took to address research relevancy to practitioners was the creation of *Management Information Systems Quarterly Executive.* The publication began in March 2002 recognizing the need for more pragmatic literature targeting managers in the field. The journal's "primary focus is research that is immediately relevant and useful for practice" (*MIS Quarterly Executive*, 2013). Even with these efforts, the issue of research relevancy remains an open debate (Gill and Bhattacherjee, 2009; King and Lyytinen, 2006; Klein and Rowe, 2007). The concern of research relevancy, like the aforementioned two concerns, has significant implications for the future direction and viability of the IS discipline, and it has remained a topic of interest to the research community.

Views towards the future of the IS discipline were recently published in the *DATA BASE* May 2012 special issue comprising of four deans' (Ginzberg, 2012; Jessup, 2012; Tanniru, 2012, Todd, 2012) and three IS professors' (Gray, 2012; Ives & Adams, 2012) perspectives. The six essays capture the viewpoints of these leaders regarding both the strengths and weaknesses of the IS academic discipline. An AMCIS 2012 conference panel subsequently extended that discourse addressing questions regarding the positioning of the discipline within the business school in terms of research and teaching (Mooney et al., 2012). Additionally, the AMCIS 2012 panel discussed strengthening relationships with other academic and practitioner communities. Recent discussions on social networking sites further indicate that these familiar concerns linger to some degree in the IS community today. As evidenced by postings on LinkedIn's AIS group, discussions cover concerns such as misconceptions of the IS field (Darnton, 2013), distinguishing IS from other fields (Alghazzawi, 2013), and the future of the field in the next decade and half-century (Power, 2013). As evidenced by the ongoing stream of discourse, views

regarding the conceptualization and status of the IS discipline continue to garner much interest to those both inside and outside of the IS community.

RESEARCH STUDY AND METHODOLOGY

This research study seeks to further our understanding of how the IS discipline is currently perceived. To do so, the study accomplishes three main objectives. First, this study investigates the present-day social representations of the 'IS discipline' espoused by IS academics and deans. Second, the study evaluates the two groups' levels of agreement with IS disciplinary concerns noted in the May 2012 special issue of *DATA BASE* summarized in Ives & Adams (2012). Third, the study elicits social representations of 'additional concerns' held by IS academics and deans beyond the 11 covered in Ives & Adams (2012). The research is presented in three phases to carry out these three objectives.

Consistent with previous perception research, a survey methodology is employed to collect the data. Qualtrics survey software disseminated the survey and collected the responses. The electronic survey was distributed to the various respondents soliciting their feedback on their representation of the IS discipline. Then, they were questioned regarding the concerns mentioned in Ives & Adams (2012). A final survey section asked the respondents to list 'additional concerns' they had regarding the IS discipline. The presentation sequence of these three survey phases should be noted. Due to the organization of the survey instrument, the respondents had not been prompted about the alleged concerns in Ives & Adams (2012) when they responded about their representations of the IS discipline. Nor had they contemplated 'additional concerns' which would have also negatively framed their views on the IS discipline.

Phase 1: Elicitation and Comparison of IS Social Representations

Data Collection

IS academics and deans were first asked to submit up to six responses that they held about the IS discipline. Survey participants replied with phrases or sentences depicting their representation of the IS discipline. The submissions were entered into six free-text fields on the survey. The specific instructions provided to the IS academic and dean respondents were to:

> *Please write down up to 6 words or phrases that come to mind when you hear the discipline of "Information Systems".*

Data Analysis

Phases 1 and 3 of this research study both draw upon *social representations theory* as the theoretical lens for understanding views as expressed by communities. Moscovici (1981, 1984) first applied the term '*social representation*' to this approach when studying how different groups within French society transformed differing conceptualizations of psychoanalysis into common knowledge. Moscovici's work followed Durkheim (1898) who referred to mutual understandings as '*collective representations*'. According to Lewin (1947), reality for individuals is largely based on what is socially accepted as reality. Considering this, the social representations approach serves as a means of revealing what individuals within various groups accept as reality. Furthermore, agents from the same social environment tend to represent the world around them similarly (Berger & Luckmann, 1966). Their collective social representations provide insight into their sense of their environment, encounters, and actions (Weick, 1995). Using a social representation perspective is beneficial because it allows researchers to investigate viewpoints that communities possess toward phenomena of interest as communicated by community members.

Social representation research often analyzes the networks of objects structurally following Abric's (1976) distinction into either core or peripheral systems. Core elements are characterized as ones that are stable, coherent, consensual, and historically marked by the group; whereas the peripheral elements within the system allow individual flexibility indicative of the variations derived from individual experiences (Abric, 1993, 2001). Another point of divergence is that the core system maintains the stability and rigidness of a representation while the contradictions can arise in the peripheral system. Borgatti & Everett (1999) formalized these intuitive conceptualizations of coreness by developing computational methods for discovering core and periphery structures within network data.

Within the IS field, the research community has drawn upon social representations theory to investigate its research questions. A 2005 ICIS panel discussed the potential of the social representations theoretical lens in the context of knowledge management research (Vaast et al., 2006). In the IS literature, studies have relied on the theory to seek understanding of community perspectives regarding particular objects of interest. Specifically, researchers have elicited social representations from agents regarding their work practices to examine how the practices change with IT use (Vaast & Walsham, 2005). Also, Gal and Berente (2008) advocated that the social representations approach could offer additional insight into IS implementations by applying it to studies that used a technological frames framework.

Vaast (2007) compared social representations drawn from multiple occupational communities to illustrate distinctions in how the communities come to know IS security. By investigating seven communities in the healthcare context such as doctors, nurses, and IS professionals, Vaast found that IS professionals typically viewed IS security as a technological issue jeopardized by hackers and viruses. In contrast, the other communities typically

represented IS security as an issue of securing patient information from behavioral threats. In another example, researchers were interested in how IT professionals represented 'burnout' due to job stress (Pawlowski, Kaganer, & Carter, 2007). Their findings suggest burnout is most associated with topics such as hours/workload, emotional strain, and job performance. In total, 22 concepts emerged as topics with 10 of them located in the core of the network.

Jung, Pawlowski, & Wiley-Patton (2009) offered a methodological approach conducting social cognition research in IS that incorporates social representations theory. The theoretical lens was applied to demonstrate how it can be used to understand the sensemaking of an emerging phenomena, electronic health records (EHRs). The findings illustrated that EHRs were represented through five core topic clusters including convenience, accessibility, technology, records, and privacy.

This study was conducted borrowing from the methodology presented in Jung et al. (2009). Specifically, the data collection process gathered participant responses via free word associations captured using online survey software's free-form text fields. The data were subsequently coded to identify the concepts that emerged from the responses. One author initially coded the topics using an open-coding technique. It is important to note that the two datasets were each coded separately and independently. Although the two groups have several overlapping topics, the initial coding for each group was considered in insolation from the other group. The decision to approach the data analysis using an open coding technique segmented by sample group was taken in order to allow the topics of concern to emerge organically. This approach was preferred rather than matching responses to an a priori list of topics.
After the second coder reviewed the data using the original codes created by the first coder, some modifications were made to the labeling of codes if a consensus emerged that a new descriptor

better captured the spirit of the respondents' submissions. The resulting coding scheme was applied to all topics that were submitted for both groups. Then, differences between coders were reconciled by discussion to achieve consensus. After the codes were reconciled, the resultant coded topics were analyzed.

Topics were analyzed using several statistical indicators to understand their position and prominence within the overall network. Specifically, topics were measured in terms of *frequencies, sum of similarity* scores, and *coreness* scores. The *frequency* count of occurrence for each topic was calculated to ascertain the salience of topics (Flament, 1994). A *coreness* score for each topic was derived by taking the Euclidean distance from the topic to the center of the network. This determined the topic's closeness to the network's center. Similarity scores of all topics were measured in terms of correlation to other topics. Subsequently, an aggregated *sum of similarity* score was assigned to each topic by adding together the topic's similarity scores with all other topics.

Using UCINET6 software (Borgatti, Everett, and Freeman, 2002), the data matrices were created and analyzed for characteristics such as inter-attribute similarity (Flament, 1986) and coreness. Then, sum of similarity measures were computed along with coreness values. Based on the characteristics of the datasets, the software calculated a recommended core and periphery membership structure (Flament, 1984) for the topics. A strength of UCINET software was that it allowed for categorical and continuous calculation of core and peripheral networks.

Phase 2: Evaluation of Agreement with Ives & Adams (2012) Concerns

Data Collection

In Phase 2, data were collected in order to represent the two constituent groups questioned in Phase 1, deans and IS academics. The May 2012 DATA BASE issue contained

four dean's perspectives and three IS academics' views on the status and future of the field. This research study expands that conversation to those two communities at-large. The Ives & Adams (2012) article along with Gray's article represented the voice of IS academics in the previous special issue. To ascertain the sentiments of the IS research community at-large, the survey was presented to AIS members via the AISWorld listserv. To obtain the broader voice of the dean community, the survey was emailed to business school deans who are members of the AACSB. Since the population of business school deans is small, additional business school administrators with titles of assistant and associated deans were also emailed the survey. To gather feedback from the two communities, IS academics and deans were posed the following question:

The following are a list of perceived problems related to the Information Systems discipline. To what extent do you agree or disagree that each of these items is a problem with the Information Systems discipline?

The phrasing of items in the survey mirrored the original concerns presented in Ives & Adams (2012) in order to extend the commentary to the respective broader audiences. Participants responded with their level of agreement or disagreement with the specific concerns using 5-point Likert-typed scale ranging from "strongly disagree" represented by 1 to "strongly agree" represented by 5. The 11 specific concerns summarized by Ives & Adams (2012) are:

Regarding the IS research agenda:

1. *Adds little value to practitioners.*
2. *Tends towards backward looking methodologies.*
3. *Is driven by envy of other fields' methodologies and past research rather than current problems.*
4. *Is too focused on "hot" technologies.*
5. *Isn't well funded.*

Regarding the IS discipline in general:

6. *The IS field is still ill-defined.*
7. *Student demand is still off.*
8. *IT is boring.*
9. *IS alumni are generally young and therefore not yet particularly charitable.*
10. *We have little leverage with Deans who question or value and credibility.*
11. *Falling faculty salaries.*

Data Analysis

Responses to the 11 survey items were gathered via Qualtrics survey software. Statistical characteristics were computed at the group level to represent IS academics and deans communities. The two group's means were analyzed for each of the 11 items. Two sample t-tests assuming unequal variance calculated whether the differences between group responses were statistically significant.

Phase 3: Elicitation and Comparison of Additional Concerns

Data Collection

Along with the assessments of the 11 previously addressed concerns, IS academics and deans submitted up to three additional concerns that they held regarding the IS discipline. The survey participants replied with phrases or sentences depicting their concerns. The concerns were entered into three free-text fields on the survey. To elicit feedback from the two communities, IS academics and dean were requested to:

Please list other concerns to the Information Systems discipline that you have in addition to the ones listed above.

Data Analysis

The data analysis detailed in Phase 1 above was implemented in Phase 3 to analyze the 'additional concerns'. Beyond the analysis and comparison of the conceptual subcomponents, the groups' additional concerns were visualized in two-dimensional space. NetDraw software (Borgatti, 2002) aided in the construction of the two network models presented. Using the Jaccard index, the profile similarity measurement was calculated for the analysis. The similarity coefficient represented the proportion of cases in x_i equal to y_i given that either x_i, y_i, or both were greater than 1. Essentially, the similarities indicated the proportion of instances having concerns coexisting in an individual's submission. The resulting inter-attribute similarity data

matrix was then derived into a network model by NetDraw. Using NetDraw, the graphs more efficiently represented the information in regards to the network-related characteristics.

FINDINGS

Demographics of Respondents

The IS academic sample consists of 103 responses. The respondents included 78 males and 25 females (76% and 24%, respectively). The dean sample yielded 89 total responses. The respondents were 61 males and 28 females (69% and 31%, respectively). Other demographics of the survey participants were solicited as well. Details of the respondents' current job titles, job tenure in current position, and ages are presented in Tables 7 – 9. The participants' demographic results are shown per respondent group.

Table 7: Job Titles of Respondents

IS Academic Respondents				**Dean Respondents**		
Job Title	Number	Percentage		Job Title	Number	Percentage
Full Professor or equivalent	38	37.3%		Assistant or Associate Dean, or equivalent	53	59.6%
Associate Professor or equivalent	28	27.5%		Dean or equivalent	32	36.0%
Assistant Professor or equivalent	14	13.7%		Department Head or equivalent	2	2.2%
Graduate Student	12	11.8%		Assistant or Associate Vice President, Assistant or Associate Vice Chancellor, or equivalent	1	1.1%
Research Assistant or Research Associate	4	3.9%		Vice President, Vice Chancellor, Provost, or equivalent	0	0%
Instructor	1	1.0%		President, Chancellor, or equivalent	0	0%
Other	5	4.9%		Other	1	1.1%
No response	1	1.0%		No Response	0	0%
Total	103	100%		Total	89	100%

Table 8: Time in Current Job Position

IS Academic Respondents				Dean Respondents		
Time	Number	Percentage		Time	Number	Percentage
Less than 1 year	7	6.8%		Less than 1 year	13	14.6%
1 to 3 years	13	12.6%		1 to 3 years	37	41.6%
3 to 5 years	17	16.5%		3 to 5 years	14	15.7%
5 to 10 years	20	19.4%		5 to 10 years	14	15.7%
10 to 20 years	27	26.2%		10 to 20 years	9	10.1%
More than 20 years	18	17.5%		More than 20 years	1	1.1%
No Response	1	1.0%		No Response	1	1.1%
Total	103	100%		Total	89	100%

Table 9: Age of Respondents

IS Academic Respondents				Dean Respondents		
Age	Number	Percentage		Age	Number	Percentage
Under 30 years	4	3.9%		Under 30 years	1	1.1%
30 to 39 years	23	22.6%		30 to 39 years	5	5.6%
40 to 49 years	21	20.6%		40 to 49 years	20	22.5%
50 to 59 years	30	29.4%		50 to 59 years	33	37.1%
60 years and over	24	23.5%		60 years and over	30	33.7%
No Response	1	1.0%		No Response	0	0%
Total	103	100%		Total	89	100%

Phase 1 Results: Elicitation and Comparison of IS Social Representations

IS academics and deans responded with up to six words of phrases that they held regarding the IS discipline. The survey participants submitted their concerns in open-text fields on the survey. As previously described, an open coding technique was used to develop the IS representation topics from the participants' responses. Two coders independently analyzed the textual responses which resulted in the formulation of 43 IS academic topics and 36 dean topics. (See Appendix E, Tables 24 and 25 for examples of all IS social representation topics).

The findings first elicit both groups' representation in isolation. The independent, group-level analyses elicit the structural sub-components in the conceptualization of the 'IS academic discipline'. From this, the topics that are central, 'core' elements are separated from the outer conceptual elements of the 'periphery'. Descriptive characteristics are provided for the IS representation topics including core/periphery memberships, coreness scores, frequency counts,

and sum of similarity scores. The details of how these metrics are calculated are available on page 70.

After analyzing each group separately, a side-by-side comparison of IS academic and dean group topics is analyzed to glean the similarities and differences between the groups. The IS representation topics found in both groups are matched accordingly. Then, findings are discussed related to the nature of these between-group commonalities.

Each IS representation topic is distinguishable by a topic ID, such as 'RD5', that concatenates three pieces of information. First, an 'R' is coded for *Representation Topics* to distinguish them from *Concern Topics* in an upcoming section's analysis. Second, the respective sample group is labeled with either an 'A' for *IS Academics* or 'D' for *Deans*. Third, a unique number is assigned each topic based on the topics ranking by *frequency*. The example, 'RD5', refers IS *Representation Topic* from the *Dean* sample that is the 5th most *frequently* occurring. The topic associated with the ID of 'RD5' is *computers* which also has the highest coreness score of the group despite being the 5th most frequent.

IS Academics

The survey returned a total of 478 representations from the IS academics about the IS discipline. The initial coder's data analysis created 55 topics from the representations. After discussion, the first and second coder agreed to consolidate the topics into the 43 IS representation topics presented in Table 10. The Kappa coefficient was 0.85 for the IS academic dataset demonstrating substantial strengths of agreement (Landis and Koch, 1977). They are sorted by coreness values with the highest 28 coreness scores comprising structural core. The remaining 15 topics represent the peripheral elements.

Table 10: IS Academic Social Representations of IS, Core/Periphery Membership

IS Social Representation Topics		Membership	Frequency	Coreness	Sum of Similarity
RA7	management	CORE	19	0.213	22.8
RA2	business	CORE	44	0.212	22.7
RA1	IT	CORE	53	0.206	21.6
RA16	problem solving	CORE	11	0.205	21.9
RA12	people	CORE	12	0.203	21.9
RA13	adding value	CORE	12	0.201	21.8
RA17	data/databases	CORE	9	0.201	22.2
RA8	development	CORE	17	0.192	20.0
RA18	innovation	CORE	9	0.191	20.4
RA5	use	CORE	21	0.190	19.9
RA3	computers	CORE	30	0.188	20.5
RA10	socio-technical systems	CORE	16	0.185	19.9
RA14	processes	CORE	12	0.184	18.9
RA6	information systems	CORE	20	0.181	19.4
RA21	networks	CORE	8	0.181	19.4
RA29	service	CORE	5	0.181	19.8
RA26	change	CORE	6	0.172	17.7
RA15	information	CORE	12	0.166	18.3
RA19	software	CORE	9	0.165	18.2
RA41	Deployment	CORE	1	0.165	17.8
RA27	implementation	CORE	6	0.161	18.6
RA4	research	CORE	27	0.159	19.1
RA22	decision support	CORE	8	0.159	17.3
RA30	project management	CORE	5	0.154	17.3
RA9	analysis/design	CORE	17	0.151	16.6
RA20	collaboration	CORE	9	0.146	16.7
RA36	outsourcing	CORE	3	0.138	14.4
RA31	applications	CORE	5	0.134	15.7
RA33	analytics	PERIPHERY	4	0.119	13.0
RA23	relevancy	PERIPHERY	8	0.110	14.6
RA25	dynamic	PERIPHERY	7	0.104	14.3
RA38	alignment	PERIPHERY	2	0.104	10.9
RA24	interdisciplinary	PERIPHERY	8	0.095	13.3
RA34	application area	PERIPHERY	4	0.094	10.6
RA35	users	PERIPHERY	4	0.089	10.5
RA37	disciplinary criticisms	PERIPHERY	3	0.087	11.3

Table 10, continued.

IS Social Representation Topics		Membership	Frequency	Coreness	Sum of Similarity
RA11	misunderstood	PERIPHERY	13	0.083	12.3
RA42	expensive	PERIPHERY	1	0.074	8.8
RA28	diverse	PERIPHERY	6	0.040	7.5
RA43	student demand	PERIPHERY	1	0.038	6.8
RA32	focus of the discipline	PERIPHERY	5	0.037	6.2
RA39	exciting	PERIPHERY	2	0.024	4.4
RA40	jobs	PERIPHERY	2	0.021	5.5

IS Academics socially represent the 'academic IS discipline' most frequently using the terms: *IT* (RA1), *business* (RA2), and *computers* (RA3). These three terms collectively make sense as leading responses since the *IT* artifact is arguably considered the conceptual core of the discipline (Benbasat & Zmud, 2003). Furthermore, the *business* environment is the traditional environment that IS research is situated within, and the *computer* is the most visual manifestation of most information systems.

The fourth most often response is *research*. The high response of *research* demonstrates that IS academics view it as the prominent function of the discipline. Of the three pillars of academia, *research*, *teaching*, and *service*, that are often considered the descriptive functions of an academics job, 'teaching' is noticeably absent from the responses. Although *service* (RA29) made the list of responses, it was in the context of provide IT services rather than the previous connotation implied as part of an academic's job description.

IS academics oftentimes mention *use* (RA5) placing it as the fifth most frequent concept offered. It is followed by self-evident concept of *information systems* (RA6) which is a finding resultant from the open-coding technique utilized. My assessment is that this finding should be disregarded since IS *is* the actual phenomenon of interest being investigated. It simply surfaces as a topic because respondents at times explicitly typed 'information systems' in conjunction

with other concepts (e.g., *development, use and impact of information systems in business*) in their response.

Management is the seventh most common response; however, its high scoring similarity measures place it at the center of the IS discipline's conceptual core. *Management* edged out the top two most frequent responses of *IT* and *business* in terms of the similarity measures taken. Two other topics, *problem solving* (RA16) and *adding value* (RA13) also ranked highly in the core membership according to the measures, respectively fourth and sixth overall. The two topics are additionally conceptually similar to each other. This, perhaps, is not such a coincidence. The two topics generally connote the goals or outcomes often desired not only from actual information systems, but also from the research that studies them!

IS academics recognize the importance of the human component in the IS discipline. Core concepts such as *people* (RA12) and *socio-technical systems* (RA10) represent the human role in IS as does the peripheral topic of *users* (RA35). These human-focused topics are integral components of an IS; however, a stark distinction exists between the prominence of these topics and the near absence of topics about people in the 'student' context. IS academics overwhelmingly neglected to associate students with the IS discipline. In fact, only three total responses came close to the notion of students: one submission mentioning *student demand* (RA43) and two other responses about *jobs* (RA40).

The periphery contains topics that reside outside the conceptual core. It typically consists of concepts that are transient in nature. In this analysis, many of the peripheral elements are features of the IS discipline rather than components of the phenomenon. In other words, these elements are more aptly thought of as adjectives about the IS discipline instead of synonyms of the concept or its parts. These descriptors are both positive and negative in tone. For example,

positive topics such as *dynamic* (RA25) and *exciting* (RA39) produce the healthy sense that the discipline is thriving and fresh. To the contrary, topics such as *misunderstood* (RA11) and *expensive* (RA42), along with other *disciplinary criticisms* (RA37) generate a negative view of the discipline.

Deans

The dean group offered 419 total representations of the IS discipline. Analysis of the data yielded 63 initial topics by the first coder. The two coders then refined the 63 topics to 39 final IS representation topics through consensus. The Kappa coefficient was 0.64 for the dean dataset demonstrating substantial strengths of agreement (Landis and Koch, 1977). Table 11 presents the findings sorted by coreness. The topics possessing the largest 23 coreness scores were assigned to the core, and the remaining 16 were designated to the periphery.

Deans responded most frequently with topics of concepts such as *IT* (RD1), specific *application areas* (RD2), *data/databases* (RD3), and *skills* (RD4). *Computers* (RD5) was the fifth most frequently reported topic; however, its high similarity scores placed it most central within the core. The topic *application areas* followed as second closest topic in the conceptual core.

The dean group offered several supported topics associated IS such as responses noting the IS discipline is *essential* (RD12), *exciting* (RD38) as well as representing the discipline as *dynamic* (RD20) *diverse* (RD39) and *challenging* (RD33). However, not all representations from deans were as flattering. They voiced that the IS discipline is *misunderstood* (RD10), while another topic formed around *disciplinary misconceptions* (RD18). Furthermore, deans mentioned some negatively associated topics such as *disciplinary criticisms* (RD19), claims IS is a *dying field* (RD27). Lastly, the dean group voiced some familiar concerns about the IS

discipline such as that it is *ill-defined* (RD28), *absorbing into other disciplines* (RD37), *fit with other disciplines* (RD16), and *expensive* (RD36).

Table 11: Dean Social Representations of IS, Core/Periphery Membership

IS Social Representation Topics		Membership	Frequency	Coreness	Sum of Similarity
RD5	computers	CORE	19	0.235	18.2
RD2	application areas	CORE	32	0.227	17.2
RD11	management	CORE	15	0.225	17.1
RD13	information systems	CORE	13	0.223	17.2
RD3	data/databases	CORE	30	0.220	16.5
RD7	software	CORE	16	0.220	16.4
RD4	skills	CORE	22	0.219	16.9
RD8	business	CORE	16	0.213	18.1
RD1	IT	CORE	36	0.212	16.0
RD21	information	CORE	7	0.210	17.0
RD9	analysis/design	CORE	16	0.209	15.8
RD17	networks	CORE	9	0.205	15.3
RD25	processes	CORE	6	0.204	16.5
RD22	use	CORE	7	0.195	14.9
RD23	alignment	CORE	7	0.187	15.3
RD34	support	CORE	2	0.179	14.5
RD29	n/a	CORE	4	0.178	14.5
RD6	job market demand	CORE	19	0.164	15.6
RD18	disciplinary misperceptions	CORE	9	0.161	13.7
RD19	disciplinary criticisms	CORE	9	0.159	14.8
RD26	decision support	CORE	6	0.158	13.8
RD14	analytics	CORE	13	0.156	13.6
RD30	innovation	CORE	4	0.137	11.5
RD16	fit with other disciplines	PERIPHERY	10	0.126	10.5
RD31	research	PERIPHERY	4	0.122	11.8
RD20	dynamic	PERIPHERY	9	0.118	11.9
RD12	essential	PERIPHERY	14	0.106	11.9
RD24	technical	PERIPHERY	7	0.100	10.5
RD32	enrollment	PERIPHERY	4	0.100	9.6
RD15	curriculum issues	PERIPHERY	13	0.094	11.4
RD10	misunderstood	PERIPHERY	16	0.063	8.4
RD33	challenging	PERIPHERY	4	0.040	7.3

Table 11, continued.

IS Social Representation Topics		Membership	Frequency	Coreness	Sum of Similarity
RD38	exciting	PERIPHERY	2	0.038	4.3
RD39	diverse	PERIPHERY	2	0.034	6.6
RD28	ill-defined	PERIPHERY	6	0.017	1.3
RD35	collaboration	PERIPHERY	2	0.053	4.0
RD36	expensive	PERIPHERY	2	0.052	6.0
RD27	dying field	PERIPHERY	6	0.046	7.0
RD37	absorbing into other disciplines	PERIPHERY	2	0.043	0.3

Group Comparisons

Since the IS academics' data were analyzed independently from the deans' data, the analysis of the two groups generated distinct topic codes. This open-coding process allowed for a truer depiction of the participants' social representation of the phenomenon being investigated. While the two analyses produced independent portrayals of the 'IS discipline', the social representations of the two groups are quite similar as shown by the high number of matching topics. Table 12 illustrates which topics are common between the two groups. The linkages denote the structural membership matches of topics offered by the groups.

The top responses from each group transcended groups as well. For example, *IT* (RA1& RD1), *business* (RA2 & RD8), and *computers* (RA3 & RD5) ranked highly in the core for both groups. Additionally, *analysis/design* (RA9 & RD9) were core concepts of both groups. Although, *misunderstood* (RA11 & RD10) fell into the periphery of both groups, the concept was frequently represented. Student-related topics such as *student demand* (RA43) and *enrollment* (RD32) received very little attention by the groups, resulting in the periphery as well. IS academics were much more inclined to report *research* (RA4 & RD31) than deans. Whereas, deans much more often responded with examples of *application areas* (RA34 & RD2) and job-related topics (RA40 & RD6) than IS academics.

Deans were more likely to represent *data/databases* (RA17 &RD3) than IS academics. However, deans surprisingly did not mentioned any concepts related to IS implementation. Furthermore, their responses did not register any topics about IS development either. The closest conceptual topic they mentioned is that of *analysis/design* (RD9). On the other hand, IS academics often voiced topics within the area such as *development* (RA8), *analysis/design* (RA9), *implementation* (RA27), and *deployment* (RA41).

Several topics that socially represent the IS discipline reflect concerns the groups hold towards the discipline. For starters, both groups acknowledge that the IS discipline is *misunderstood* (RA11 & RD10). Although the topic is positioned in the periphery of both groups, the topic was offered quite frequently. Since it ranked 11th and 12th amongst the two groups, it appeared more often than over 70% of the all representations of IS. This is only supported by the fact that a number of dean responses were actually *disciplinary misconceptions* (RD18).

The confusion associated with the IS discipline to some degree adversely impacts student enrollment in IS programs. Both groups have attached concerns of *enrollment* (RD32), *curriculum issues* (RD15), and *student demand* (RA43) to the IS discipline, albeit marginal for the IS academics. Another social representation that could be viewed in a negative light is that IS is seen e*xpensive* (RA42 & RD36). I suspect these responses were likely associated with an actual information system rather than the IS discipline, but this does raise the point that the two concepts are inextricably linked together.

Table 12: Comparison of IS Representations Core/Periphery Memberships

IS Academics			Deans	
ID	Topic		ID	Topic
RA1	**IT**		RD1	**IT**
RA2	**business**		RD2	**application area**
RA3	**computers**		RD3	**data/databases**
RA4	**research**		RD4	**skills**
RA5	**use**		RD5	**computers**
RA6	**information systems**		RD6	**job market demand**
RA7	**management**		RD7	**software**
RA8	**development**		RD8	**business**
RA9	**analysis/design**		RD9	**analysis/design**
RA10	**socio-technical systems**		RD10	*misunderstood*
RA11	*misunderstood*		RD11	**management**
RA12	**people**		RD12	*essential*
RA13	**adding value**		RD13	**information systems**
RA14	**processes**		RD14	**analytics**
RA15	**information**		RD15	*curriculum issues*
RA16	**problem solving**		RD16	*fit with other disciplines*
RA17	**data/databases**		RD17	**networks**
RA18	**innovation**		RD18	**disciplinary misperception**
RA19	**software**		RD19	**disciplinary criticism**
RA20	**collaboration**		RD20	*dynamic*
RA21	**networks**		RD21	**information**
RA22	**decision support**		RD22	**use**
RA23	*relevancy*		RD23	**alignment**
RA24	*interdisciplinary*		RD24	*technical*
RA25	*dynamic*		RD25	**processes**
RA26	**change**		RD26	**decision support**
RA27	**implementation**		RD27	*dying field*
RA28	*diverse*		RD28	*ill-defined*
RA29	**service**		RD29	**n/a**
RA30	**project management**		RD30	**innovation**
RA31	**applications**		RD31	*research*
RA32	*focus of the discipline*		RD32	*enrollment*
RA33	*analytics*		RD33	*challenging*
RA34	*application area*		RD34	**support**
RA35	*users*		RD35	*collaboration*
RA36	**outsourcing**		RD36	*expensive*
RA37	*disciplinary criticism*		RD37	*absorbing in other disciplines*
RA38	*alignment*		RD38	*exciting*
RA39	*exciting*		RD39	*diverse*
RA40	*jobs*			
RA41	**deployment**			
RA42	*expensive*			
RA43	*student demand*			

*Core elements in bold, and peripheral elements in italics.

Structural Alignments between Groups	
Core/Core	
Core/Periphery	
Periphery/Periphery	

More direct concerns associated with the IS discipline are noticeable in topics such as *disciplinary criticisms* (RD19 & RA37) coming from both groups. The dean group even links the concept of the IS discipline to a *dying field* (RD27). While IS academics are not as bleak in their representations, they do mention the *focus of the discipline* (RA32) in a problematic way. Similarly, the dean group conveys three other threats they associate with the IS discipline that appear troubling such as the *fit with other disciplines* (RD16), *absorbing into other disciplines* (RD37), and the *ill-defined* (RD28) nature of the field.

Taking into account concerning sentiments are associated with the IS discipline by both deans and IS academics, these perceptions are investigated further in the following two phases of this chapter. Next, Phase 2 investigates the two groups' level of agreement with previously noted concerns including such as ones just discussed here. Then, Phase 3 performs the same type of analysis as seen here in Phase 1. Though the techniques in Phase 3 mirror Phase 1, the phenomenon of interest shifts from the 'IS discipline' to 'concerns of the IS discipline'. This allows the explicit representation of additional concerns that might not appear in Phase 2.

Phase 2 Results: Evaluation of Agreement with Ives & Adams (2012) Concerns

The second phase of the research study analyzes the survey responses for each of the 11 proposed concerns as summarized in Ives & Adams (2012). The IS academic and dean groups' descriptive statistics are detailed in isolation. Then, a comparison between groups for each of the 11 concerns shows whether the two groups are in concert with their views towards the proposed concerns.

IS Academics

Overall, IS academics agree with 7 concerns and disagree with 4 concerns presented. Their agreement is determined by mean responses greater than 3, whereas disagreement is

represented when mean responses fell below 3. Specifically, IS academics agree with concerns such as *adding little value to practitioners,* focusing on *backward looking methodologies, having little leverage with Deans*, and *falling faculty salaries*. Table 13 presents the findings from the IS academics group. The frequencies of responses, ranging from 1 showing strong disagreement to 5 showing strong agreement, are shown for all 11 items along with the total number of responses, standard deviation, and mean of the responses.

Table 13: IS Academic Responses to Concerns

Concerns with the IS Research Agenda								
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	n	Standard Deviation	Mean
1. Adds little value to practitioners.	11	22	13	29	14	89	1.30	3.15
2. Tends towards backward looking methodologies.	4	21	19	34	11	89	1.10	3.30
3. Is driven by envy of other fields' methodologies and past research rather than current problems.	10	22	25	22	9	88	1.17	2.98
4. Is too focused on "hot" technologies.	11	30	19	24	5	89	1.14	2.80
5. Isn't well funded	5	12	16	38	16	87	1.12	3.55
Concerns with the IS Discipline								
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	n	Standard Deviation	Mean
6. The IS field is still ill-defined.	8	20	14	33	14	89	1.23	3.28
7. Student demand is still off.	4	23	17	38	7	89	1.07	3.24
8. IT is boring.	46	22	13	7	1	89	1.03	1.82
9. IS alumni are generally young and therefore not yet particularly charitable.	4	32	41	8	3	88	0.83	2.70
10. We have little leverage with Deans who question our value and credibility.	3	18	25	24	18	88	1.13	3.41
11. Falling faculty salaries.	4	19	41	14	10	88	1.01	3.08

Deans

Overall, deans do not appear to share the same concerns as IS Academics regarding the problems presented. The dean responses are shown in Table 14. Similar to Table 13, the frequencies ranging from strongly disagree to strongly agree are shown with each item's number of responses, standard deviation, and mean.

Table 14: Dean Responses to Concerns

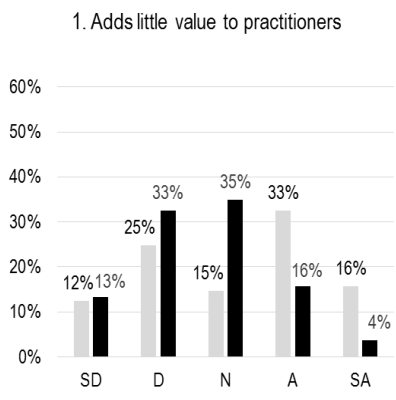
Concerns with the IS Research Agenda								
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	n	Standard Deviation	Mean
1. Adds little value to practitioners.	11	27	29	13	3	83	1.02	2.64
2. Tends towards backward looking methodologies.	8	15	37	20	2	82	0.96	2.91
3. Is driven by envy of other fields' methodologies and past research rather than current problems.	12	18	36	14	2	82	1.00	2.71
4. Is too focused on "hot" technologies.	5	19	39	18	2	83	0.89	2.92
5. Isn't well funded	6	12	36	25	4	83	0.96	3.11
Concerns with the IS Discipline								
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	n	Standard Deviation	Mean
6. The IS field is still ill-defined.	1	18	16	40	7	82	0.97	3.41
7. Student demand is still off.	2	19	8	42	12	83	1.07	3.52
8. IT is boring.	13	35	22	9	4	83	1.04	2.47
9. IS alumni are generally young and therefore not yet particularly charitable.	5	29	30	19	0	83	0.88	2.76
10. We have little leverage with Deans who question our value and credibility.	9	31	29	12	2	83	0.95	2.60
11. Falling faculty salaries.	6	26	37	14	0	83	0.83	2.71

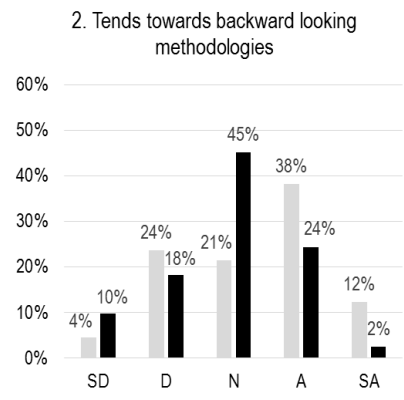
Deans collectively agree with only three of the concerns, and collectively disagree on the remaining 8 items. The high number of disagreements by deans is interesting since the 11 questionnaire items were summarized from four deans. The three concerns that deans agree with are that IS field is *not well funded*, *the IS field is ill-defined*, and *student demand is still off*. IS academics, coincidentally, collectively agree with those three concerns as well.

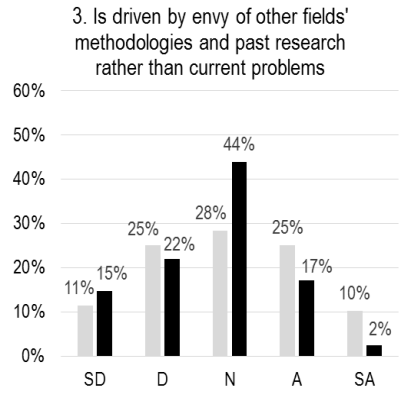
An item-by-item account is depicted in Table 15 of both IS academic and dean response patterns for 11 concerns addressed. The frequency counts occurring in Tables 13 and 14 are represented as percentages in Table 15 to account for the difference in sample sizes.

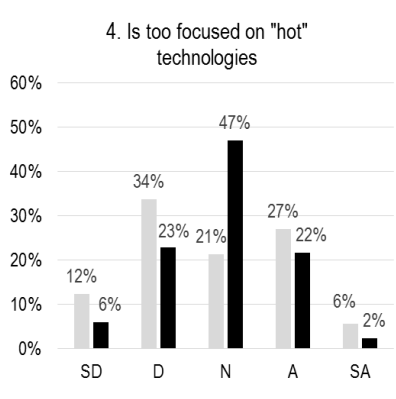
Table 15: IS Academic and Dean Responses to Concerns

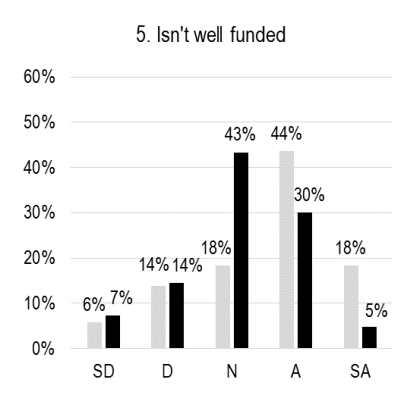
Concerns with the IS Research Agenda











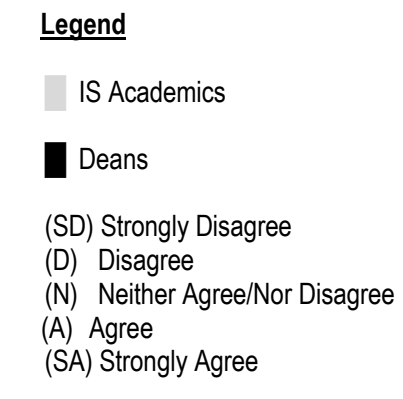
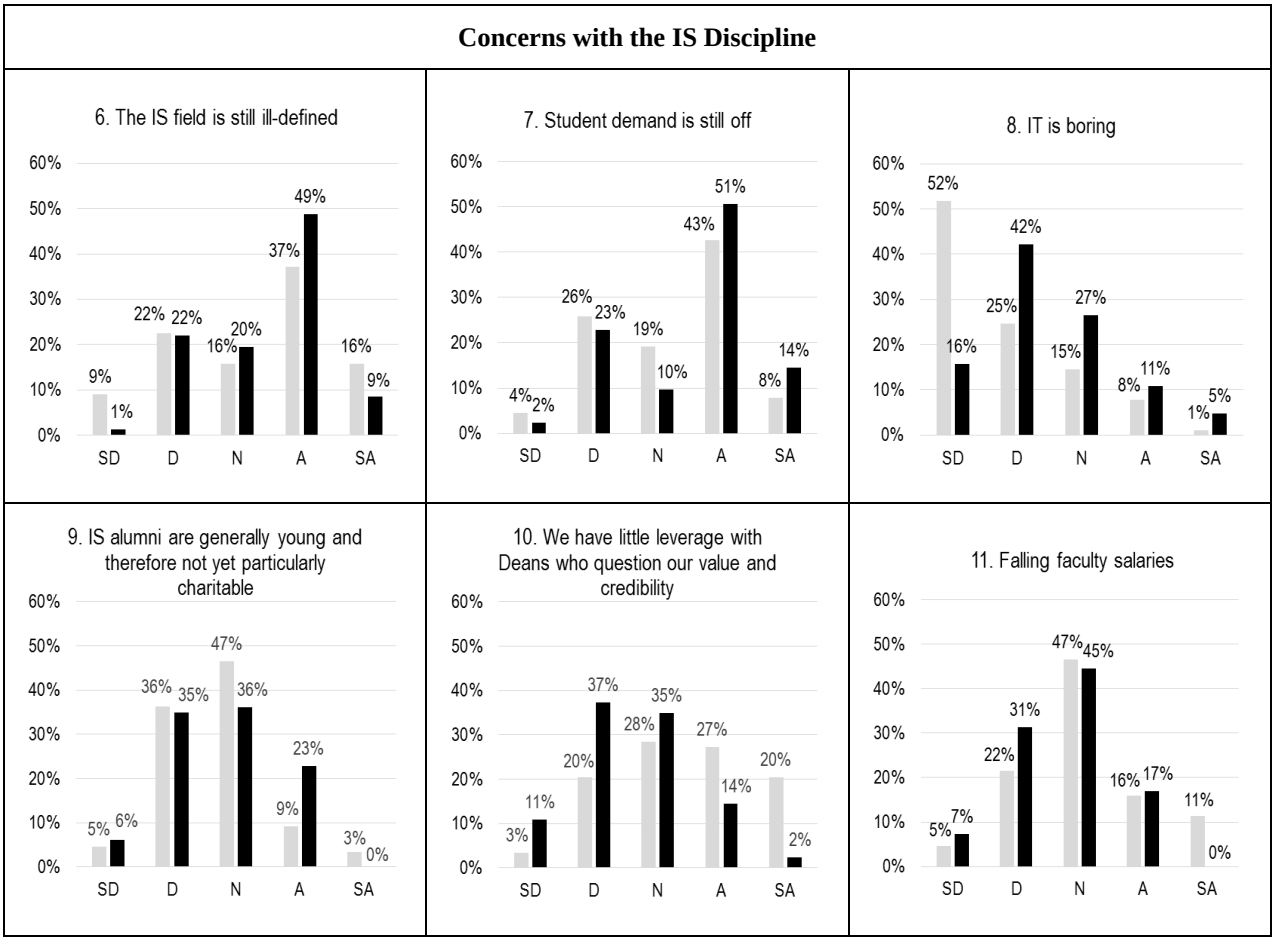


Table 15, continued.



Group Comparisons

The findings reveal the dean and IS academic groups have statistically equivalent responses regarding 5 of the 11 concerns presented in Ives & Adams (2012); the other 6 concerns show significant differences when comparing the two groups' responses at a 0.05 level of significance. Focusing on the five concerns that received similar responses from the two groups, it is apparent that the groups both agree with two assertions previously reported as problems for the IS field. These two problems are that *the IS field is still ill-defined* and that *student demand is still off*. However, the other three issues having similar group responses are instances that both groups refute the claims summarized in Ives & Adams (2012). IS academics and deans both

disagree that Item 9, *IS alumni are generally young and therefore not yet particularly charitable*, is a real concern. The remaining two concerns, Items 3 and 4, both groups take essentially neutral positions although a slight disagreement to the originally proposed claims is noticeable.

In addition, 6 of the 11 concerns have marked group differences between IS academics and deans; however, not all of the concerns that generated a statistical group difference exemplify issues of disagreement between the groups. For example, the significant differences regarding Item 5 (*isn't well funded*) and Item 8 (*IT is boring*) merely distinguish the strength of the agreement or disagreement between the groups. The remaining four items having a statistically significant differences are due to conflicting group sentiments toward the presented concerns. Using the scale's neutral midpoint of 3.0 as the demarcation for group agreement and disagreement, the two groups are at odds on Item 1 (*adds little value to practitioners*), Item 2 (*tends towards backward looking methodologies*), Item 10 (*we have little leverage with deans who question our value and credibility*), and Item 11 (*falling faculty salaries*). Both groups' means, the differences in the means, and whether those differences are statistically significant are detailed in Table 16.

The most surprising finding is with respect to how the groups responded to the criticism that IS research *adds little value to practitioners*. Collectively IS academics agree that this is a problem whereas the deans do not view this as problematic. The statistically significant difference reveals that IS academics are more concerned about and more critical of the value that IS research is providing to practitioners. On the contrary, deans do not share the concern that the IS field's research *adds little value to practitioners*. A similar contrast can be made between the groups regarding the concern that IS research methodology *tends towards backwards looking methodologies*. IS academics see this as a problem while deans are collectively neutral on it.

Table 16: Mean Comparisons

About the IS Research Agenda:	IS Academic Mean	Dean Mean	Mean Difference	p-value	Significant Difference?
1. Adds little value to practitioners.	3.15	2.64	0.51	0.004824	Yes
2. Tends towards backward looking methodologies.	3.30	2.91	0.39	0.014647	Yes
3. Is driven by envy of other fields' methodologies and past research rather than current problems.	2.98	2.71	0.27	0.107689	No
4. Is too focused on "hot" technologies.	2.80	2.92	0.12	0.448296	No
5. Isn't well funded.	3.55	3.11	0.44	0.006175	Yes
About the IS Discipline:	**IS Academic Mean**	**Dean Mean**	**Mean Difference**	**p-value**	**Significant Difference?**
6. The IS field is still ill-defined.	3.28	3.41	0.13	0.429669	No
7. Student demand is still off.	3.24	3.52	0.28	0.086030	No
8. IT is boring.	1.82	2.47	0.65	0.000060	Yes
9. IS alumni are generally young and therefore not yet particularly charitable.	2.70	2.76	0.06	0.677979	No
10. We have little leverage with Deans who question our value and credibility.	3.41	2.60	0.81	0.000001	Yes
11. Falling faculty salaries.	3.08	2.71	0.37	0.009846	Yes

*Using $\alpha = 0.05$.

On the third reviewed concern, IS academics do not have a discernible position from the neutral middle ground. While deans show slightly more disagreement with concerns related to *envy of other fields' methodologies and past research focus rather than current problems*, the strength of disagreement is not significantly different than that of IS academics. A somewhat similar response pattern applies to the problem of being *too focused on "hot" technologies*. The two groups have statistically equivalent responses although IS academics are perhaps less convinced that it is a concern to the IS discipline.

A significant difference is found on the fifth concern topic of IS funding. However, the divide is actually not as wide as perhaps might be expected. While deans and IS academics affirm that lack of funding is a problem, IS academics are more supportive that lack of funding is

a concern. On this issue, the two groups do not dispute that the IS field *is not well funded*; they only merely have a significant difference in the intensity of their collective group agreement.

On the issues of *ill-defined field* and *lack of student demand*, both groups yield similar patterns of response having more people taking the moderated positions (agree or disagree) than staying neutral; however, the agreeing responses clearly outnumber those disagreeing thus making both groups statistically equivalent in affirming the concerns. The findings suggest that both groups concur that concerns of an *ill-defined field* and *student demand* are challenges for the IS discipline.

Of all 11 statements, the assertion that *IT is boring* is the most disagreed with item in both samples. While groups disagree with the statement overwhelmingly, a significant difference between the groups is present since IS academics more strongly disagreed with the claim than the deans. The significant difference that exists between the groups is merely a matter of intensity similar to findings with regards to views about funding concerns.

The claim that IS academics *have little leverage with Deans who question our value and credibility*, as one might have expected, reveals a significant divide between the respective groups with IS academics supportive of the sentiment and deans disagreeing with it. The difference between groups towards this item was the largest on the survey. This item is the only one that explicitly proposes a wedge between the two constituent groups, so it might seem intuitive that the groups would be at odds on this concern.

On the final concern addressed, the issue of *falling faculty salaries* also creates a statistically significant divide between the two groups. The deans tend to disagree that *falling faculty salaries* are a problem generating a group mean of 2.71. IS academics are mostly divided

on the issue collectively settling on an essentially neutral group mean of 3.08 that is statistically greater than the deans' mean.

Overall, IS academics in general are relatively more agreeable to concerns related to IS research agenda than deans. The one previously noted exception is Problem 4 about "hot" technologies. On the five research-focused questions, deans are decidedly more neutral about that concern. Deans chose the "neither agree nor disagree" option most often for all five of these items producing the normal distribution with the neutral choice at its center. Deans, along with IS academics, respond most often as neutral on Problems 9 and 11 about charitably of IS alumni and falling faculty salaries as well.

Phase 3 Results: Elicitation and Comparison of Additional Concerns

Along with the assessments of the 11 previously presented concerns, IS academics and deans responded with up to three additional concerns that they held regarding the IS discipline. The survey participants submitted their concerns in open-text fields on the survey. As previously described, an open coding technique was used to develop concern topics from the participants' responses. Two coders independently analyzed the textual responses which resulted in the formulation of 21 IS academic topic concerns and 12 dean topic concerns. (See Appendix F Tables 26 and 27 for examples from all concern topics).

The findings suggest that the IS academic and dean response sets have some interesting similarities and notable differences in perceived concerns. Paralleling the format of Phase 1's findings, the concern topics' descriptive characteristics are provided partitioned by group. They include the core/periphery memberships, frequency counts, coreness scores, and sum of similarity scores.

IS Academics

The open-texted survey responses of additional concerns accrued a total of 155 concerns from the IS academics. Analysis of the data by the initial coder coalesced the 155 concerns into 29 clusters. These clusters are referred to as 'concern topics'. Then, the first and second coder agreed to consolidate the compiled IS academic concern topics into the 21 concern topics presented in Table 17. The Kappa coefficient was 0.61 for the IS academic dataset demonstrating substantial strengths of agreement (Landis and Koch, 1977). Table 17 presents details of the concern topics as perceived by the IS academic group sorted by coreness values.

Table 17: IS Academic Additional Concerns, Core/Periphery Membership

Concern Topics		Membership	Frequency	Coreness	Sum of Similarity
TA16	misunderstood	CORE	4	0.299	7.0
TA6	journal publication process	CORE	9	0.294	7.0
TA3	relevancy	CORE	15	0.291	6.9
TA1	distinction from other disciplines	CORE	18	0.274	6.9
TA7	showing value to outsiders	CORE	8	0.267	6.7
TA4	research focus	CORE	15	0.265	6.4
TA2	focus of the discipline	CORE	16	0.262	6.5
TA10	research diversity	CORE	6	0.260	6.4
TA17	workforce labor issues - students	CORE	4	0.246	5.9
TA13	research methodology	CORE	5	0.230	5.7
TA5	introspection/self-appraisal issues	CORE	10	0.210	5.8
TA15	lack of respect/importance	PERIPHERY	4	0.198	5.6
TA12	assessing contributions within academic IS field	PERIPHERY	5	0.196	5.0
TA11	workforce labor issues - faculty	PERIPHERY	6	0.184	5.0
TA8	teaching and curriculum challenges	PERIPHERY	8	0.158	4.7
TA9	absorbing into other disciplines	PERIPHERY	7	0.145	4.3
TA14	keeping up with technology	PERIPHERY	4	0.138	4.1
TA19	financial/funding	PERIPHERY	2	0.137	4.1
TA20	lack of premier journals	PERIPHERY	2	0.126	3.7
TA18	enrollment/recruiting	PERIPHERY	2	0.106	3.5
TA21	US dominance	PERIPHERY	2	0.086	2.9

The most frequently raised concern topic is *distinction from other disciplines* (TA1) with 19 responses reiterating the long-standing issue of the discipline's identity crisis still persists. This position is articulated by an IS academic who acknowledges that "IS does not appear to have a natural academic home". Several respondents call attention to the "overlapping" or "misalignment" of IS with other disciplines. The specific disciplines referenced are typically computer science, information science, and the business school disciplines such as management, marketing, and accounting. Some concerns cite the variability of naming as a source of "confusion about [the] difference between IS, CIS, Information Science and other names for what constitutes our 'discipline'".

Beyond the name-related issues with the IS discipline, the lack of *distinction from other disciplines* concern manifests itself in the course offerings and research domains. One respondent notes, "*It is increasing difficult to define our 'discipline' in business schools when other disciplines teach overlapping content (e.g., e-commerce as a marketing class, accounting IS) as a different class from IS for all the other majors*". Another respondent states, "*Given the ubiquity of IT applications, all so-called IS issues are actually managerial (management /marketing/decision science research) or technical (computer science)*".Whether conceptualizing research space or categorizing course curricula, IS academics continue to view the lack of clearly established disciplinary boundaries as a threat to the IS academic field.

Other frequently voiced issues such as *focus of the discipline* (TA2) and *research focus* (TA4) are further indications the conceptualization of the discipline is viewed problematically. These concerns account for 16 and 15 responses, respectively. While the two topics are conceptually similar, the delineation is determined by whether the respondent's remark aimed specifically at research practices or the remark targeted the more general notion of the IS

discipline. Conflicts as to the necessity of research theory are apparent in contradictory concerns such as one respondent stating "our obsession with theory is completely in opposition to our field which is applied" while another IS academic asserts "lack of creative IS-specific theories" is a concern. Another comment points out the variance in *research focus* by region is an issue by noting "European scholars tend to do more applied research than Americans".

More generalized responses regarding the field's concentration are represented by the topic *focus of the discipline*. This topic contains remarks advocating for redirection of the discipline's efforts although a consensus is not clear as to the appropriate focus. One IS academic believes "management topics are mostly missed; too strong technology focus(ed)" while another "think(s) there needs to be stronger focus on information and its use as relative to emphasis on application of technology". Other statements are more to the point suggesting the IS community is "unclear what we are trying to achieve". The tie that binds this group of concerns is perhaps the perception, as one respondent offers, the field has "no conceptual core".

A closely related issue to *research focus*, is the topic of *research diversity*. While one respondent notes there are "few females in the major", the concerns expressed in this topic are chiefly worried that the IS discipline has "too wide a scope". As one response explains, the "IS discipline is very diverse because technology is very diverse". Another IS academic agrees the array of technologies contributes to the diversity in a concern stating "the discipline is becoming fragmented and driven more by the context of the IT application". The overall view expressed by *research diversity* is perhaps best captured by the following response:

> *"The diversity of what is included in IS makes it difficult to function as discipline as the boundaries are so fluid. My PhD in the 90s was in IS, but I'm not sure I'm becoming increasingly uncomfortable with calling myself an IS researcher, in part because it has no real meaning anymore."*

Another concern familiar to IS literature, *relevancy* (TA3), is highly present in the views of IS academics. Fifteen of the responses fit the classification of *relevancy*. The high frequency count of the topic, along with the high coreness measure of 0.291, places *relevancy* in the structural core of IS academics concerns. This affirms *relevancy* remains a prominent issue for the discipline. The high coreness score reveals that this issue was reported by people who also reported a variety of other issues.

The topic of *misunderstood* (TA16) captures four responses of IS academics who believe the IS discipline is not clearly grasped by others. The sentiments expressed within this topic all indicate the respondents' beliefs that IS is not properly comprehended by outsiders. For example, one IS academic opines, "*Students have no idea what an MIS degree is, and their parents don't know either*". Despite only four responses attributed to this topic, *misunderstood* ranks highest in sum of similarity and coreness. These high values occur due to the topic's association with eight other distinct concern topics mentioned by the IS academics who mentioned this topic.

The final topic included in the core sub-structure of the IS academics representations is *introspection/self-appraisal issues*. Ten responses are combined into this topic that are essentially comments reflective of how IS academics view themselves as a group. For example, an IS academic mentions "*introversion of (the IS) discipline*" as concerning, and another lists that IS academics are "*not open to criticism*". Others suggest IS academics are "too inward looking" and that "we are too negative in thinking about ourselves". Even the actual consideration of concerns is bothersome for one IS academic who replies one issue is "our concern with having concerns - there is too much naval gazing".

The remaining nine concerns make up the periphery sub-structure of the IS academics concerns. These nine topics are infrequently mentioned by the group and are offered in conjunction with other concerns to a lesser degree suggesting that the peripheral concerns are not pervasive throughout the IS academic community. Since social representations of groups are dynamic over time, the peripheral concerns are more likely the ones to experience change. Figure 5 shows the visual representation of the network of IS academics' concerns. Using Jaccard's similarity as the procedure for determining coreness, the top 11 of the 21 topics are assigned to the structural core with the remaining 9 concern topics comprising the periphery structure. The core/periphery membership boundary includes all of the topics with coreness values of 0.200 and higher into the core sub-structure.

Ives & Adams (2012) note an additional concern with the 11 they synthesized from the deans. They mention "write-only" journals as a concern to the IS field. This sentiment is widely shared in the IS academics community. Their article mentions solutions such as "*alternative forums for quality research of interest to, and approachable by, a practitioner audience*", and laments that these publications are "*not among journals that non-tenured faculty are encouraged to publish in*". Ives & Adams (2012) labels this problem as the "*the age-old if inscrutable, 'rigor versus relevance' conundrum*". These findings suggest their contentions resonate well with many of the IS academics' concerns. Six of the 21 topics including *relevancy, research focus, journal publications process, showing value to outsiders, assessing contributions within academic IS field,* and *lack of premier journals* (TA3, TA4, TA6, TA7, TA12, and TA20, respectively) are raised in connection with "write-only" journals. The topic network map presented in Figure 5 illustrates the relatively close proximity of these 6 topics within the IS academic group's overall network map.

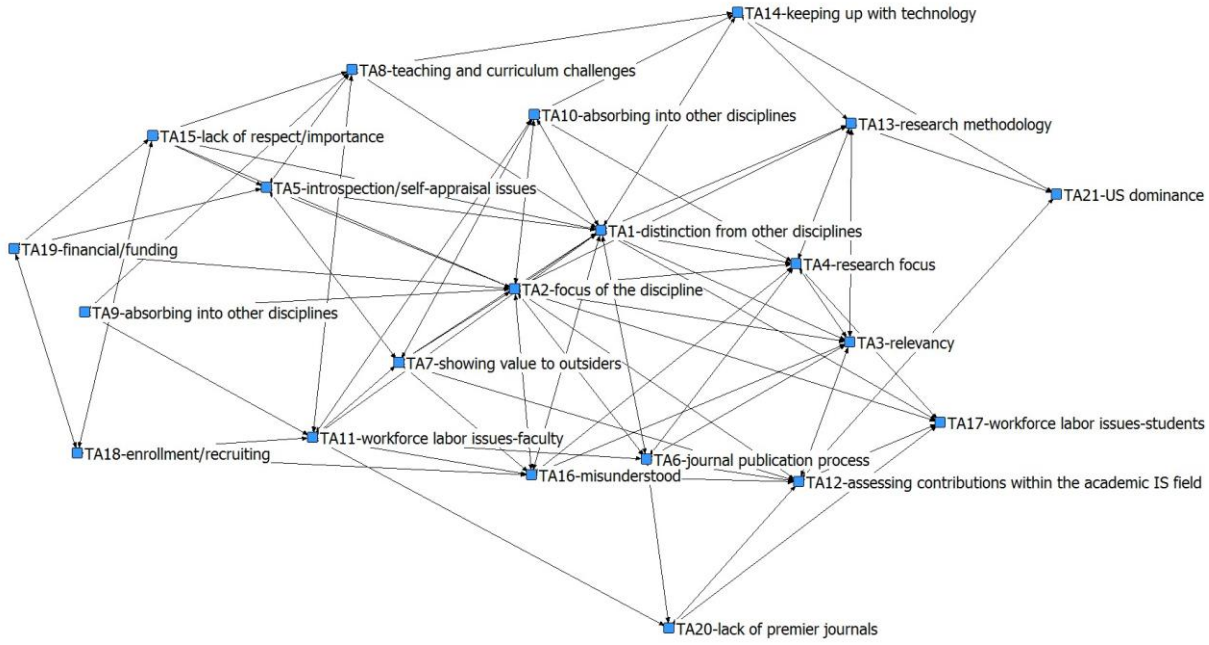


Figure 5: Topic Network Map of Additional Concerns from IS Academics

The IS academic concern topic network map also depicts the close proximity of the three concerns drawing on the IS conceptual core previously discussed. These concerns are *distinction from other disciplines*, *focus of the discipline*, and *research focus* (TA1, TA2, and TA4, respectively). The closeness of the topic nodes highlights the degree to which individual survey participants' reporting of the three topics coincided.

Likewise, the high degree of connectedness of the *journal publication process* (TA6) is apparent from the topic network map as well as its relatively high similarity and centrality scores. It ranks second in both sum of similarity at 6.953 and coreness at 0.294. Since journal publications represent a dominant factor in demonstrating merit particularly at research-oriented institutions, it is reasonable for the concern of *journal publication process* to lie central to concerns that pertain to recognizing achievements such as *assessing contributions within the academic IS field* (TA12), *showing value to outsiders* (TA7), *workforce labor issues-faculty* (TA11) and *lack of premier journals* (TA20). While analyzing IS academics' concerns in

isolation generates interesting results supportive of their perceived concerns, the next section reveals that the deans' responses are informative as well.

Deans

The dean group responses returned 99 concerns in total. Analysis of the data yielded 18 initial concern topics by the first coder. Then, the consensus of the two coders was to refine the 18 topics into 12 final concern topics. The Kappa coefficient for the dean dataset was 0.64 demonstrating substantial strengths of agreement (Landis and Koch, 1977). Table 18 presents the findings sorted by coreness regarding the concern topics that were elicited from the dean group.

Table 18: Dean Additional Concerns, Core/Periphery Membership

Concern Topics		Membership	Frequency	Coreness	Sum of Similarity
TD5	limited quality faculty	CORE	11	0.352	7.8
TD2	ill-defined/not distinguished from other disciplines	CORE	15	0.330	7.4
TD1	curriculum issues	CORE	19	0.330	7.4
TD3	relevance	CORE	14	0.330	7.4
TD7	focus of the discipline	CORE	7	0.321	7.3
TD6	research quality	CORE	8	0.309	7.1
TD11	research focus	CORE	3	0.301	7.0
TD4	marketing of discipline	CORE	13	0.270	6.3
TD8	collaborating/fit with other disciplines	CORE	6	0.263	6.3
TD10	expenses	CORE	4	0.251	6.1
TD9	enrollment	PERIPHERY	6	0.190	4.8
TD12	jobs	PERIPHERY	2	0.135	3.7

The most commonly reported concerns from deans are *curriculum issues* (TD1) having a frequency of 19 responses. While one dean states "the coursework lacks focus", more often deans' comments provide insight into their values as to what should be changed about the curriculum. Several deans advocate for more managerial emphasis stating IS curricula "is often not taught with a managerial focus" and "greatest challenge is helping non IT specialist students to value the rudiments of IT management". Other dean respondents highlight the importance of

technology saying "technical IS is in demand" and arguing that IS courses "need to be linked to more technical training to assist in job placement". Although no single prescription is unanimously voiced by the deans, the comments offered often acknowledge the necessity of determining the correct balance in course content such as "determining how much attention to pay to social media". Collectively, *curriculum issues* are the most often mentioned topic of concern for deans.

Curriculum issues ranks second tied with *ill-defined/not distinguished from other disciplines* in terms of coreness and similarity situating it near the center of dean's concerns core sub-structure. The view of the IS discipline as ill-defined and not distinguished from similar fields is also the second most often mentioned concern by deans having 15 responses categorized to the topic. Some deans simply note the field is "poorly defined", and the "lack of well-defined subject area" is problematic. Others comment that IS does "not have a clear place in the business school". A reply that sums up the general confusion associated with the naming inconsistencies is as follows:

"Is it MIS, CS, CIS, EE or some other thing? Our B-School calls it Business Information Systems (BIS). Is BIS IS? The WSJ is also an IS, is it not? IS seems to need more definition as a discipline."

The enigmatic nature of our disciplinary identity, whether referring to defining its composition or inconsistencies in its monikers, perhaps results in a "lack of student understanding of what the IS field is" in the words of one respondent.

The top ranking concern in terms of similarity and coreness, *limited quality faculty* (TD5), surpassed the two more-mentioned concerns of c*urriculum issues* and *ill-defined/not distinguished from other disciplines.* The issue of *limited quality faculty* is given 11 times by

deans. The concern topic co-occurs with all of the remaining 11 concerns with the exception of *jobs* when analyzing dean responses.

Only 3 of the deans mention *research focus* (TD11) as an issue. The research-minded responses by deans are more often centered on *research quality* (TD6) as the area of concern. When offering concerns of "low quality research", deans generally frame the measure in terms of rigorousness. One dean claims IS "has not established the rigor of journals through similar rejection rates to the other business disciplines". The *relevance* dimension of *research quality* is also questioned by a dean who asserts IS research is "too focused on meaningless problems rather than real world problems". Less often, dean comments purely address the *research focus.* In one instance, a dean contends that "soft IS is overcrowded and adds little value". Despite having only been mentioned 3 times, the *research focus* topic contains a higher coreness and sum of similarity values due to its co-occurrence with 7 of the possible remaining 11 topics.

Another observation is that deans who report the concern that IS *ill-defined/not distinguished from other disciplines* (TD2) more often also mention issues such as *curriculum issues* (TD1) and *focus of the discipline* (TD7). The similarities amongst these concerns indicate they are commonly associated together by the deans. These similarities in concern topics reflect the linkages in the aforementioned concerns of "coursework lacks focus" and "lack of well-defined subject area".

The network diagram in Figure 6 illustrates the relationship amongst the nodes of concern topics in the overall network structure. The topic map illuminates ties between the 12 specific concerns denoting the connected concerns have been reported jointly by at least one respondent. Additionally, the structural makeup of the network diagram reveals the visual proximities of specific topics reflecting their closeness to other topic nodes. For instance, pairs

of concerns such as *relevance* (TD3) and *limited quality faculty* (TD5) are more commonly reported together and with similar topics. In contrast, nodes such as *enrollment* (TD9) and *jobs* (TD12) are not connected and are situated far apart because they were not provided together by an individual respondent, nor do the other topics offered by their informant share commonalities. Adding to the insights from analyzing the concerns of the IS academic and dean groups independently, this study next discusses the two groups in comparison.

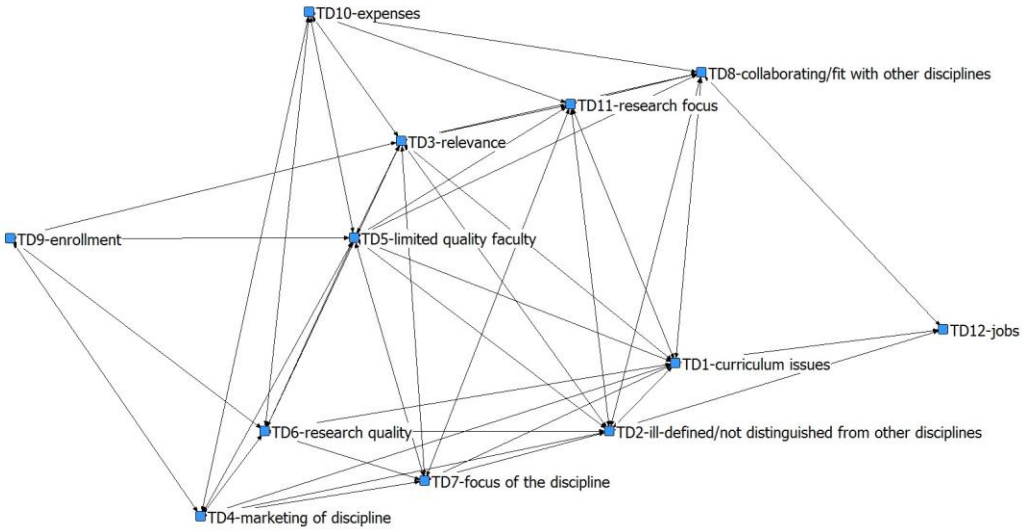


Figure 6: Topic Network Map of Additional Concerns from Deans

Group Comparisons

While the open-coding nature of the coding process did yield uniquely phrased concerns for the two groups, commonalities between the group's topics are apparent allowing for comparisons and contrasts of the stakeholder groups elicited concerns. Table 19 illustrates the correspondence of topics denoting whether structural membership matches occurred between the two groups.

Table 19: Comparison of IS Concerns Core/Periphery Memberships

IS Academics			Deans	
#	Topic		#	Topic
TA1	**distinction from other disciplines**		TD1	**curriculum issues**
TA2	**focus of the discipline**		TD2	**ill-defined/not distinguished from other disciplines**
TA3	**relevancy**		TD3	**relevance**
TA4	**research focus**		TD4	**marketing of discipline**
TA5	**introspection/self-appraisal issues**		TD5	**limited quality faculty**
TA6	**journal publication process**		TD6	**research quality**
TA7	**showing value to outsiders**		TD7	**focus of the discipline**
TA8	*teaching and curriculum challenges*		TD8	**collaborating/fit with other disciplines**
TA9	*absorbing into other disciplines*		TD9	*enrollment*
TA10	**research diversity**		TD10	**expenses**
TA11	*workforce labor issues-faculty*		TD11	**research focus**
TA12	*assessing contributions within academic IS field*		TD12	*jobs*
TA13	**research methodology**			
TA14	*keeping up with technology*			
TA15	*lack of respect/importance*			
TA16	**misunderstood**			
TA17	**workforce labor issues-students**			
TA18	*enrollment/recruiting*			
TA19	*financial/funding*			
TA20	*lack of premier journals*			
TA21	*US dominance*			

*Core elements in bold, and peripheral elements in italics.

Structural Membership Alignments	
Core/Core	
Core/Periphery	
Periphery/Periphery	

Many concern topics transcend both the IS academic and dean groups. The issue of IS's distinction from other disciplines is a core concern of both groups. This concern is represented with slightly different labels, di*stinction from other disciplines* (TA1) and *ill-defined/not distinguished from other disciplines* (TD2). This issue of disciplinary distinction is the most commonly reported problem of the IS academics and second highest problem for deans. It also reflects the two groups having a firm agreement with Phase 1's Item 6 that states *the field is still*

ill-defined. Two other concerns similar to these top concerns include *absorbing into other disciplines* (TA9) and *collaborating/fit with other disciplines* (TD8). This pair of concerns is illustrative of the subtle difference in perspectives that emerge from the open coding technique independent of the other group's responses. The IS academic responses convey a fear of dissolving into other disciplines; whereas, deans' concerns concentrate on how to bring IS together with other disciplines constructively.

An additional high-ranking concern for both groups is *relevancy* (TA3 and TD3). It rates as the third most frequently occurring problem in both samples. The groups agree that lack of relevancy occurs in reference to the business practitioner community. One IS academic states, "*I worry that there is a gap between academia and the industry - I think there is some very good research being done - but how well is this communicated to the industry and 'end-users'?*". In addition to noting that the *relevancy* issue primarily resides between the IS academic and practitioners, IS academics agree the quest for rigorous research often exacerbates this problem. The IS academic group generally views lack of relevancy within the research context and mention it as a problem resultant from the need for rigorous research.

Another concern shared by the IS academics and deans is how the IS discipline is viewed by people outside of the discipline. Although the topic labels are not exactly identical due to the open coding technique employed, my interpretation is that *showing value to outsiders* (TA7) and *marketing of discipline* (TD4) are generally similar sentiments. For example, a dean expresses the concern that IS should be "making potential job opportunities known to students before they choose majors", and an IS academic remarks, "*we need to more fully demonstrate our value to our colleagues in B-Schools*". In both instances, it is apparent that IS academics can address the concerns by better promoting the IS field.

The *focus of the discipline* (TA2 and TD7) is an area of considerable concern to both groups. These concerns appear frequently in both samples; however, representations of what constitutes the "incorrect" focus span a variety of conflicting viewpoints. Within the IS academic community a socio-technical divide exists with respondents either siding that the discipline is too technical or not technical enough. One concerned respondent remarks there is "too much emphasis on the 'touch, feely aspects of computing.'" On the other hand, those suggesting the discipline is too technically oriented argue for a stronger management/business focus.

Two additional pairs of related topics that are less pronounced in both groups are *enrollment/recruiting* (TA18) and *enrollment* (TD9) along with financial challenges such as *financial/funding* (TA19) and *expenses* (TD10). Both of these concerns fit into the periphery of the IS academic social representation analysis. The deans also mention *enrollment* as a periphery concern; however, *expenses* are in the core although only 4 responses are coded as this topic. The findings that concerns towards expenses and enrollment challenges received little attention from either group is somewhat confounding. The two concerns are supported in the Phase 2 evaluations of Item 5, *isn't well funded*, and Item 7, *student demand is still off*, yet only a few participants evoked them in Phase 2's open-ended responses.

Though the two groups echo similarities in some concerns elicited, significant differences in the responses of additional concerns surface as well. While *curriculum issues* (TD1) is the leading concern topic by deans, the comparable topic of *teaching and curriculum challenges* (TA8) is only a peripheral concern to the IS academic community. Another distinction between groups occurs in the area of *research focus* (TA4 and TD11). IS academics are much more likely to mention research focus as a concern than deans.

Another notable finding is that the job market for graduates does not register as a substantial concern to either group. The two concerns related to the issue, *workforce labor issues – students* (TA17) and *jobs* (TD12), only account for 4 and 2 responses by the groups respectively. While one dean noted that it "seems like jobs can be easily offshored", this sentiment was not widely held by either of the two communities. This finding is counter to public perception that IT jobs are being offshored.

A final distinction observed between the two groups is the presence of research-related topics. The most prevalent theme among the IS academics concerns is the research orientation of issues. Specifically, eight of the 21, topics directly speak to research including: *relevancy, research focus, journal publication process, research diversity, assessing contributions, research methodology, lack of premier journals*, and *U.S. dominance* (TA3, TA4, TA6, TA10, TA12, TA13, TA20, and TA21, respectively). While it is not altogether surprising that IS academics concerns are heavily concentrated on research, it is noteworthy that deans do not share this high degree of focus towards research issues. The research-related concerns are not as prominent with the deans who only reported the following three: *relevance*, *research quality* and *research focus* (TD3, TD6, and TD11, respectively).

Interestingly, while both groups mention concerns with a focus towards research, only deans convey concerns about quality of research. IS academics, on the other hand, are more apt to articulate procedural concerns about research such as methodological choice and publication-related issues rather than a more general concern of research quality. This subtle distinction in research-minded concerns may not be so subtle, and IS academics should take notice of deans' interest in research quality. To this point, the AACSB has clarified that quality of research,

particularly regarding research impact, is important to consider when assessing return on research investments (AACSB, 2012).

CONTRIBUTIONS AND LIMITATIONS

This study contributes to the IS field in two central ways. First, the research elucidates the representations about the IS discipline and perceived concerns of it from two key stakeholder groups. The study explores the collective voice of each community, and then juxtaposes the groups' representations to assimilate meaning from the many stakeholder voices. The study primarily serves to enhance our understanding of perceptions about IS discipline and disciplinary concerns. These findings are particularly practical for nascent IS researchers who may be unfamiliar with the views regarding the academic IS discipline from the perspectives of IS academics and business school administrators. Moreover, the findings are also relevant for seasoned IS researchers who are familiar with the history of the field, yet question the pervasiveness of claims regarding the discipline.

Academics in other fields may find value in the research as well. While the research focus of this study is not intended to generalize the findings to other academic disciplines, the concerns analyzed are certainly not unique to, nor limited to, the IS discipline. For example, other academic disciplines also question whether their research *adds value to practitioners* or their *research methodologies* are appropriate.

Second, this research exemplifies the utility of *social representation analysis* for analyzing and presenting the phenomena in IS literature. The study adds to the growing corpus of literature within the IS field drawing upon social representations theory. This research illustrates how it can be particularly useful for understanding the collective views of stakeholder groups. The use of social representation theory allows for the contrasting of the persistent, core topics

from the possibly fleeting, peripheral ones. Furthermore, the lens enables the visualization of these topics in two-dimensional space.

Some limitations present in this study should be acknowledged. First, the sample of deans is restricted to North American institutions accredited by the AACSB. This point is noted as a limitation in the May 2012 *DATA BASE* issue as well since the contributing deans were from North American institutions. Similarly, this study refines the population of deans to universities that are accredited by the AACSB; therefore, the responses of these deans may not necessarily be reflective of deans outside of North America. Though the three IS academics in the aforementioned commentaries are also from North American universities, this study is inclusive of the international IS academic community.

Second, this study did not specifically address the opportunities present in the IS field. The decision was made in an effort to shorten the survey length to obtain greater participation. Future research that explores stakeholder group perceptions of the opportunities available for the IS discipline is welcomed.

Lastly, three of the original survey items in Phase 2 are comprised of more than a single problem claim. Specifically, Items 3, 9, and 10 contain two compounded claims within each. Responses on these items would perhaps differ if the items were split into separate claims. I suspect that some respondents may have chosen a more neutral position on these items if they held conflicting views towards the claims coupled in the statements. Although the questions could be conceived as distinct problems, ultimately my judgment was to preserve the wording of the original problem summation presented in Ives & Adams (2012).

CONCLUSION

This chapter's first objective was to gain an understanding of current social representations of the 'IS discipline' voiced by deans and IS academics. Many of the core elements transcended groups such as *IT, business, computers use, management, decision support,* and *data/databases*. However, some differences exist between groups including *research* (RA4 & RD31) being much more frequently reported by IS academics than deans. Also, deans much more often responded with examples of *application areas* (RA34 & RD2) and job-related topics (RA40 & RD6).

The findings from both groups indicate that respondents' representations of the IS discipline include concerns they associate with the discipline. For example, topics such as *disciplinary criticisms* (RD19 & RA37), the *fit with other disciplines* (RD16), *absorbing into other disciplines* (RD37), and the *ill-defined* (RD28) nature of the field clearly indicate concerns IS attached to the IS social representation by both groups. Knowing this, two other objectives further investigated IS disciplinary concerns.

The second objective was to empirically evaluate the two stakeholder groups regarding their level of agreement to concerns of the Information Systems discipline as summarized by Ives & Adams (2012). Only four concerns generated opposition to a substantial degree between the groups while the remaining differences were not in kind or to any great magnitude. IS academics agreement with two of the four wedge issues, *adds little value to practitioners* and *tends towards backward looking methodologies*, reveal they are in some ways more critical than deans of the IS research agenda. On the two remaining wedge issues, the divisions were perhaps more predictable. The groups were at odds as to whether IS academics have *little leverage with*

Deans who question our value and credibility and whether *falling faculty salaries* are concerns. Group affiliation would naturally seem to influence responses on those two issues.

The chapter's third objective was to elicit social representations 'additional concerns' from the respective groups. Measures of frequency, similarity, and coreness were analyzed at group level to determine prominence and relative positioning of these concerns. The most frequently represented concerns currently voiced by the IS academic community reflect issues that continue to be debated in the IS academic literature such as *distinction from other disciplines, focus of the discipline,* and *relevancy*. While deans acknowledged similar top concerns to IS academics citing issues of *ill-defined/not distinguished from other disciplines* and *relevance,* they most often viewed *curriculum challenges* as concerning to IS discipline.

Analysis of additional concerns was presented via network diagrams allowing for visualization of each group's concerns. After each group's concerns were analyzed independently, the two groups' concern topic lists were deconstructed to associate the concern topics between groups. Analysis of the similarities and differences were performed, and interpretations of the findings were offered.

In reflecting on the findings of this study, some surprising and heartening results came to light. While IS academics agreed with 7 of the 11 concerns summarized by Ives & Adams, the deans were less likely to agree with these problems. Indeed, deans disagreed with 8 of the 11 concerns presented. This suggests the crisis discourse that permeates the IS academic debate is not shared by the deans to whom IS faculty ultimately report. This does not imply there are not real concerns which face the IS discipline; there are. However, the IS academic community may be being too harsh on itself. As an example, as noted above, IS academics worry about being dissolved into other disciplines, while the deans are more focused on how to bring IS together

with other disciplines. The deans do not appear to be interested in 'dissolving' the discipline, only having IS work more constructively with other disciplines. In essence, maybe we should stop focusing on the crisis we are supposedly in, and readjust our focus to more constructively work together with other disciplines.

In the next chapter, a third paper is presented that exemplifies aforementioned call to "readjust our focus to more constructively working together with other disciplines". The chapter moves forward to consider the 'future' of IS scholarship. More specifically, it proposes a technology-enabled alternative to producing scholarly research. This new genre of research is an optimal area for IS researchers to add *relevant* contributions leading fellow researchers into a new paradigm of research production. The application can be extended outside the IS discipline, thereby *showing value to outsiders*. It also addresses concerns such as the discipline's *research focus* and how we *assess contributions within the academic IS field* while fundamentally altering the *journal publication process*. Above all, this new genre represents a niche that IS can own providing the discipline with a distinguishable 'identity' that we have sought for so long to find.

CHAPTER 4. THE CROWDSOURCED RESEARCH GENRE: AN EMERGING ALTERNATIVE GENRE FOR IS SCHOLARSHIP

ABSTRACT

How can crowdsourcing improve the future production of IS research? This chapter considers the possibilities that technology-mediated mass collaboration can offer the IS researcher community. This concept is referred to as the *crowdsourced research genre*. To better understand this alternative genre, a framework is constructed to organize discourse by applying a crowdsourcing process model to the research phases common to the general research process.

As part of constructing the framework, a *crowdsourcing process model* is developed to conceptualize the interactions within a crowdsourcing environment. This model follows the basic input-process-output (IPO) format. *Problems* and *outcomes* interact with the crowdsourcing process, and components internal to the process include: task, governance, people, and technology. The framework's construction is completed by intersecting the *crowdsourcing process model* with each of the eight phases in a *general research process*. These phases begin with the *idea generation* phase and continue through completion of the *apply results* phase.

The details of each IS research process phase are discussed to illuminate the nascent genre's features. Implementation of the *crowdsourced research framework* elucidates phase-specific characteristics as well as characteristics that persist throughout the research process. These findings are discussed, and future directions for the IS crowd are suggested.

INTRODUCTION

> *I did not expect the panelists to embrace my ideas wholeheartedly and join me on the barricades of revolution. Change in the dispersed and individualistic academic community is slow, unless there is overwhelming recognition of an imminent threat. Rather, my goal when speaking as AIS President at ICIS 2004, when responding to the panelists' comments, and when presenting my views on other occasions, is to stimulate disagreement with the status quo and engage the community in thinking of alternative ways of operating the key elements of our community, and in the process, influencing the general academic community. I firmly believe that IS will have a much rosier future if it becomes the change agent for moving the academic community to the Information Age. We have the skills, we understand the power of the technology, but we need to change our mindset from passive observers to active inventors. We are too wedded to the retrospective conservatism of the social sciences when I believe some of us should be inventors of the future.*
>
> *Richard Watson (2005)*

Peer-reviewed research publications and citations have traditionally served as the fundamental units indicating scholarly contribution amongst IS researchers (Truex, Takeda, & Cuellar, 2009). The heightened attention to publication and citation measurements as indicators of researcher achievement has created a research stream in and of itself (Gallivan & Benbunan-Fich, 2007; Huang and Hsu, 2005; Lyytinen et al., 2007). While peer-reviewed journal publications have been the dominant *traditional genre* for scholarly IS knowledge dissemination, they are not without shortcomings (Baskerville & Myers, 2009; Gray et al., 2006; Hardaway, 2005; Hardaway & Scamell, 2012; Saunders, 2005; Rowe, 2012).

This issue seeks *alternative genres* that can improve upon the status quo. But in this search, we must not be constrained by only seeking additional modes of research publication. If we solely fixate on the alternative forms of research publication, we may forego opportunities to make even greater strides toward improving IS research scholarship. This would be akin to treating a symptom rather than the underlying problem.

This study advocates that we broaden our conceptualization of *alternative genres* to include scholarly communications throughout the entire scope of the IS research process. Shortcomings visible in the publications are typically manifestations of weaknesses that have snowballed from earlier in the research process. Therefore, we should consider *alternative genres* that improve the entire research production process.

In this chapter, I explain how technology-mediated mass collaboration, referred to as *crowdsourcing*, can be applied to each phase of IS research efforts. I call this emerging alternative the *crowdsourced research genre*. In my view, technological advances are positioning *crowdsourcing system* (CSS) platforms to become the center of the research creation process. These CSS platforms have the potential to benefit the IS research community through better mobilization and coordination of collective action. Furthermore, superior research will be produced by harnessing the *wisdom of the crowd* (Surowiecki, 2005). Also, more accurate assessments of scholarly contribution will result from the transition to the *crowdsourced research genre*.

It is my belief the IS research community should take a pioneering role in development of the *crowdsourced research genre*. How ironic will it be if we are outpaced by fellow research communities in effectively adopting this IT-enabled transformation? I also believe that the IS research field will be rejuvenated by leading the development of this alternative genre since its impact extends outside of the IS discipline (Beath et al, 2013).

To present a structured discourse of the *crowdsourced research* genre, this chapter is organized as follows. Two literature streams are reviewed including one that models IS research and another on crowdsourcing. Then, a *crowdsourcing process model* is created extending prior efforts to conceptualize the phenomenon. From it, a framework is built to analyze a *general*

research process. This framework gives structure to the phenomenon referred to as the *crowdsourced research genre*. The genre's possibilities are examined and contrasted with the status quo of the *traditional genre*.

LITERATURE REVIEW

To ground discussion of the *crowdsourced research genre*, two literature streams are reviewed. First, a review of prior research efforts that model the IS research process is covered. Then, a look into crowdsourcing research informs the status of the area's research endeavors.

The IS Research Process

The IS research community has a significant subset of research studies and commentaries on topics such as research methodology considerations and philosophical implications. However, research focused on modeling the IS research is somewhat limited. Research publications of this kind target three distinct objectives: serving as tutorials, structuring disciplinary activities, and advocating for process changes.

Publications such as Bhattacherjee (2012) are intended for a doctoral student audience aimed at informing developing researchers "about the entire 'research process' from start to end." Bhattacherjee claims the "research method is one phase in that research process, and possibly the most structured and the simplest one. Most text books cover the research method section in depth, but leave out less structured, more challenging, and probably more important topics…." (Bhattacherjee, 2012, p.2). While Bhattacherjee's (2012) model is comprehensive regarding project duration, it is specifically constrained to deductive, functionalist research investigations.

Other articles modeling IS research activities set out to serve the broader research community by structuring the work efforts of the community. In these studies, researchers have

considered the entire scope of an IS research effort (Bukvova, 2009; Leist & Rosemann, 2011, Bhattacherjee, 2012). Models proposed in these studies span the lifecycle of activities in the research process from the initial idea generation to the dissemination of published results. These research efforts attempt to serve as reference models that will guide future research endeavors.

The third grouping of scientific studies exclusively concentrate on activities specific to the peer-review process (Hardaway, 2005; Hardaway & Scamell, 2012). This segment of the overall research process begins after the study has been conducted and is ready for submission to a peer-reviewed outlet. While these studies are intended for the IS research community at-large, they differ in that they advocate changing the status quo process. Rather than aiming to provide structure to the existing process, the overarching goal of these studies is process improvement through greater transparency and openness.

The aforementioned research efforts share the commonality of conceptualizing researcher activities as a process. The process of creating IS research is then encapsulated within a series of phases that tend to occur chronologically. Table 20 lists the process phases that have been proposed in the respective IS research publications.

Table 20: Research Process Models in IS Publications

Author(s)	**Year**	**Research Context**	**Process Phases**
Bhattacherjee	2012	Functionalist	Exploration, Research Design, Research Execution, Research Report
Bukvova	2009	General	Generate idea, Define problem, Define procedures, Fund research, Execute, Evaluate, Publish results, Apply results, Scientific Community
Hardaway	2005	Review Process	Paper Submission, Editor/Associate, 3 Reviewers
Hardaway and Scamell	2012	Open Knowledge Creation	Creation, Review/Revisions, Evaluation/Adoption, Publication
Leist and Rosemann	2011	Case Study	Design Research Protocol, Implementation, Conduct Data Analysis, Construct Report Composition
Leist and Rosemann	2011	Design Science	Identify and Motivate the Problem, Build the Artifact, Evaluate the Artifact, Communicate the Solution

Hardaway (2005) proposes an alternative to the current approach to research production suggesting that open source software development could serve as a model. It suggests four ways that open sourced research could benefit the practice of creating and communicating IS research. First, the open source research approach would harness the collaboration power of the Internet to create an open exchange of important questions and challenges. Second, an expansion of publication formats would reduce the lengthy production time currently commonplace in the journal review process. Third, opening up of the peer review process would shift the burden of manuscript assessment from a small number of editors to a much larger number of reviewers. This larger base of evaluators would ultimately produce higher quality work. Fourth, Hardaway (2005) advocates for the creation of an open source research portal to organize the corpus of research. This portal would leverage discussion forums and other capabilities of the Web.

Bukvova (2009) provides a more comprehensive review of research processes accounting for behavioral science, design science, and action research approaches. From the process models produced in 11 reviewed studies, Bukvova develops a *general research process* model inclusive of the activities in IS research regardless of research approach. Bukvova's (2009) general process model, shown in Figure 7, is composed of the following research activities: generate idea, define problem, define procedures, fund research, execute, evaluate, publish results, and apply results. Furthermore, the research process revolves around the scientific community.

Bukvova's (2009) *general research process* begins with the generation of an idea. The activity is traditionally performed either individually or collaboratively with colleagues. Ideas may arise from the extant literature base or borne from issues faced by practitioners. Next, this original idea is honed into a defined problem. The defined problem is often expressed in terms of a research question. Then, the procedures specifying how the research will be conducted are

determined. Details regarding the data collection and data analysis techniques are decided at this juncture.

In the execution phase, the data are collected per the guidelines established in the define procedures phase. After data are gathered, often via survey sample, interviews, or observation, it is evaluated. In behavioral research, the evaluation phase synthesizes the data collected in the execution phase to explain or predict the phenomena of interest. The published results of these findings are typically disseminated through journals or conference proceedings. Ultimately, the published results are applied to answer the original research problem. The degree to which results are applied in practice varies depending on the discipline and the nature of the original research problem.

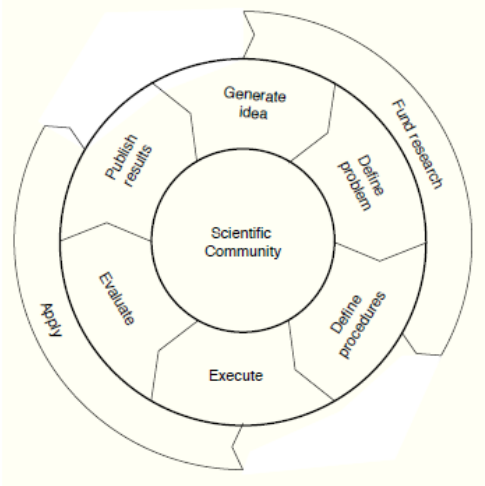


Figure 7: Bukvova (2009) General Research Process

The scientific community is at the center of Bukvova's (2009) model because it is intertwined with all other phases. For instance, research ideas are generated by community members, and research problems and procedures are generally guided by those previously deemed acceptable. Furthermore, the scientific community is also a chief consumer of the

published results. Table 21 compares the research phases in Bukvova's (2009) *general research process* model to phases presented in other models reviewed.

Table 21: Comparison of Research Process Model Phases with Bukvova (2009)

Bukvova (2009)	**Generate Idea**	**Define Problem**	**Define Procedures**	**Fund**	**Execute**	**Evaluate**	**Publish Results**	**Apply Results**
Bhatterchee (2012)	Exploration		Research Design		Research Execution		Research Report	
Hardaway & Scamell (2012)					Creation	Revise/ Resubmit Evaluation/ Adoption	Publication	
Leist & Rosemann (2011) (Case Study)		Define Research Protocol			Implemen-tation Conduct Data Analysis Construct Report Composition			
Leist & Rosemann (2011) (Design Science)	Identify & Motivate Problem				Build Artifact		Communicate Solution	
Hardaway (2005)						Paper Editor/AE/ 3 Reviewers		

Crowdsourcing

The notion of *crowdsourcing* remains a relatively nascent concept penetrating the public lexicon via Howe's *Wired* magazine article titled "The Rise of Crowdsourcing" and subsequent book on the subject (Howe, 2006). This means of production leverages the strengths inherent to larger numbers of people to fulfill tasks that would otherwise be performed by a few. For instance, crowdsourcing harnesses the "collective wisdom" of crowds putting it into action to solve a problem such as evaluating the design of t-shirt (e.g., Threadless.com).

Howe's blog defines crowdsourcing as "*the action of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large*

group of people in an open call" (Howe, 2014). Subsequently, variations on this definition have been put forth to characterize this emerging phenomena. Additionally, a variety of successful applications of crowdsourcing have been highlighted to illustrate the possibility of this means of production. Some of the most prominent successful applications of crowdsourcing include: Wikipedia, Kickstarter, Linux, Amazon's Mechanical Turk, and InnoCentive.

Much of the academic crowdsourcing research to date remains foundational in nature. Crowdsourcing-related research questions often focus on searching for a common definition, classifying types of crowdsourcing systems, or identifying their components and functions. In academic literature, studies seek to establish a common definition of the concept by synthesizing the previous works referencing crowdsourcing (Brabham, 2008; Hetmank, 2013; Estelles-Arolas and Gonzalez-Ladron-de-Guevara, 2012; Pedersen et al., 2013). Hetmank (2013) finds that CSS definitions relate to four perspectives: organizational, technical, process, and human-center perspectives.

Geiger, Rosemann, and Fielt (2011) identifies four types of CSSs based on two dimensions: how external elements are treated and how benefits are realized. They categorize four types of CSSs including: crowd processing, crowd rating, crowd solving, and crowd creation systems. *Crowd processing* systems quickly and efficiently solve problems by individually evaluating independent contributions. This CSS type essentially leverages the masses by taking a divide-and-conquer approach to solving problems. *Crowd rating* systems' contributions are also homogenous in nature, yet the contributions are aggregated to produce a collective response to the problem.

Contributions in a *crowd solving* system are evaluated individually to find the best solution to the problem. This CSS type is distinguished from crowd processing CSS's because

their contributions are heterogeneous in nature since contributions can vary if they target differing parts of the overall problem. Lastly, *crowd creation* systems are CSS's that have mixed contributions types that cannot be evaluated individually, but rather they are collectively integrated into a unified solution to a problem.

The third cluster of IS crowdsourcing research efforts concentrate on the components and functions of the CSS. Hetmank (2013) derives four components of CSSs: user management (register user, evaluate user, form user group, and enable coordination), task management (design task, assign task), contribution management (evaluate contribution, select contribution), and workflow management (define workflow, manage workflow). With a similar goal of structuring CSSs, Geiger, Seedorf, Schulze, Nickerson, and Schader (2011) identifies four activities that distinguish crowdsourcing processes: pre-selection of contributors (qualification-based, context-specific, both, none), accessibility of peer contributions (modify, assess, view, none), aggregation of contributions (integrative or selective), and remuneration for contributions (fixed, success-based, or none).

Kaganer, Carmel, Hirschheim, and Olsen (2013) considers the functions of cloud initiatives in three phases: architectural, engagement, and operational phases. Furthermore, they note that four types of business models arise from CSS platforms. The platform models reflect the role it plays in meeting buyer needs. In *facilitator* and *arbitrator* models, the platform itself provides governance. The respective models allow suppliers to connect with buyers and provide supplier competitions. In the *aggregator* and *governor* models, the responsibility of project governance rests with the buyers. The *aggregator* model enables large numbers of uncoordinated tasks to be performed; whereas, the *governor* model intensively coordinates the managerial functions related to the tasks.

Pedersen et al. (2013), shown in Figure 8, presents a conceptual model of crowdsourcing. The model includes six elements: *problem*, *people*, *process*, *technology*, *governance*, and *outcome*.

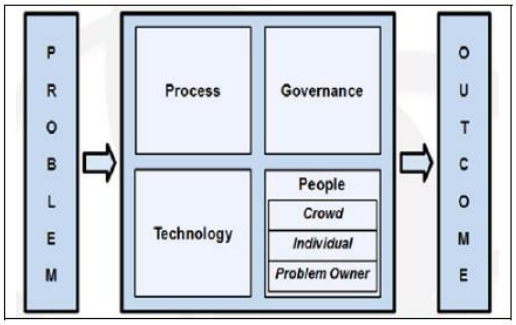


Figure 8: Pedersen et al. (2013) Conceptual Model of Crowdsourcing

The *problem* defines the initial condition that is to be solved. The framing of the problem dictates how the subsequent steps required to solve it are carried out. Problem types are divided into co-creation, crowd creation, crowd voting, crowd wisdom, or crowd funding. *People* involved are segmented into three stakeholder groups: *problem owner*, *individual*, and *crowd*. The *process* consists of the set of actions that are enacted to produce the desired outcome. *Technology* refers to the technical resources that facilitate the crowd's interactions. *Governance* entails the general policies, structures, and management processes that manage the crowd. Lastly, the *outcome* depicts the outputs of the crowdsourcing process. Pedersen et al. (2013) segments *outcomes* into *factual* and *perceptual* dimensions.

FRAMEWORK FOR THE CROWDSOURCED RESEARCH GENRE

To generate a framework for discussing the *crowdsourced research* genre, it is necessary to first develop a conceptual model of the crowdsourcing process. The *crowdsourcing process model* will then be applied to the phases of the Bukvova (2009) *generalized research model* structuring a framework for the *crowdsourced research genre*. The next two subsections

develop the *crowdsourcing process model* and construct the *crowdsourced research framework* using it.

Crowdsourcing Process Model

The crowdsourcing model developed here is rooted in the Input-Process-Output (IPO) format followed by Pedersen et al. (2013). While the Pedersen et al. (2013) model is beneficial as a starting point, it is ill-defined in its conceptualization of the *process*. Additionally, the model lacks a depiction of the process's internal relationships existing amongst the central components of *people*, *task*, *technology*, and *governance*.

To improve the Pedersen et al. (2013) conceptualization of the crowdsourcing process, Nadler & Tushman's (1977) congruence model is drawn upon to better analyze organizational problems. Nadler & Tushman (1977) added *inputs* and *outputs* to the four major organizational components from Leavitt (1965). These four components - *people, task, technology*, and *structure* - are commonly referred to as the Leavitt Diamond. Congruence among these four components ensures the transformation process functions effectively.

The proposed model is an improvement to the Pedersen et al. (2013) conceptualization because the Leavitt (1965) organizational components are subsumed under the *process*. Furthermore, it conveys their relationships as in Nadler & Tushman (1977). This model deviates from Nadler & Tushman (1977) in that it retains the *technology* component previously dropped from Leavitt (1965). Lastly, the Leavitt (1965) component of *structure* is updated to *governance.* The *crowdsourcing process model* is presented in Figure 9.

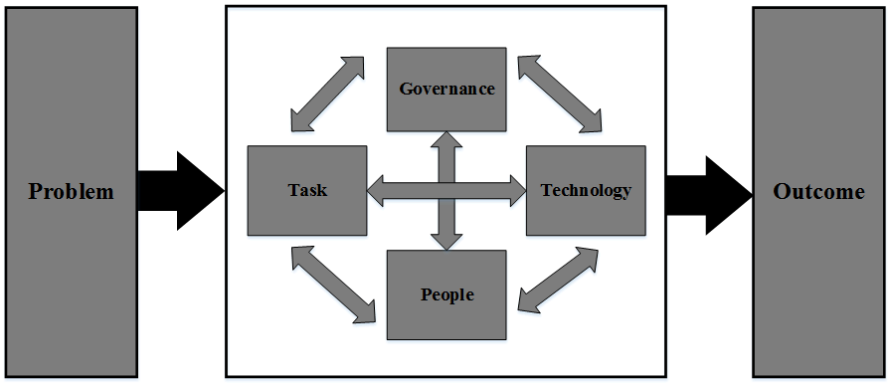


Figure 9: Crowdsourcing Process Model

Explication of the Crowdsourced Research Framework

The *crowdsourcing process model*, shown above, is applied to the phases in the *generalized research process* in Bukvova (2009) to construct the *crowdsourced research framework*. The complete framework is available in Appendix G. The framework is presented in three columns. The first column chronologically orders the eight research phases from Bukvova (2009). The second column presents the *problem(s)* addressed per phase along with the phase's respective *outcome(s)* immediately below its *problem(s)*. The third column depicts the internal crowdsourcing *process* components for each phase including: *tasks*, *governance*, *people*, and *technology*.

The following eight subsections explicate the *crowdsourced research genre* in chronologic order of the research phases appearing in Bukvova (2009). Each individual research phase is viewed using the *crowdsourcing process model* as a lens and is presented in two parts. First, the '*problems* and *outcomes'* interacting with *process* are addressed. Second, the *process* is examined through the four '*process components*' of *tasks*, *governance*, *people*, and *technology*. Throughout this examination, the *tasks* required to solve the problem(s) of each phase are noted. Next, key *governance* questions that the genre will face are posed. Then, the

impact of *people* working as a crowd is considered. Last, examples of *technology* that will facilitate the genre's productivity are illustrated. This two-part presentation structure is repeated for all eight research phases from *generate idea* to *apply results*.

Generate Idea Phase

Problem and Outcome

The initial *problem* common to all research endeavors is to *generate an idea* that is interesting and worthy of study. Dennis & Valacich (2001) notes "the first and most important aspect of any research project is to develop the research team and the key question(s) the project will address". The traditional research model suggests that idea generation is precipitated by consultation with prior research literature. Theory-driven research often attempts to create or extend theoretical explanations for phenomena of interest. Therefore, the logical beginning for research of this kind is located between the gaps of existing work.

Allowing the crowd to solve the *idea generation* problem carries multiple benefits. The most direct impact is gained from the crowd's feedback to fellow researchers that can preempt 'reinventing the wheel'. Another benefit is the infrastructure that would emerge as a by-product of centralizing the idea generation. The aggregation of ideas would instantiate an IS body of knowledge strengthening the IS community's shared sense of identity (Hirschheim & Klein, 2003; Hirschheim & Klein, 2012).

The primary *output* of this phase is formation of specific ideas. The traditional research production genre is suboptimal for the formation and retention of ideas. Colleagues typically perform this act through direct ephemeral conversations or via email. While the ideas ideally progress into testable research questions, they often are pigeonholed or forgotten without being carried out or even registered. In the crowdsourced research genre, generated ideas can be

centrally stored and shared using a CSS platform. This allows for the phase's outcome, the *generated idea,* to become a recognized contribution to knowledge in and of itself.

Process Components

Task

The tasks in this first phase carry out the fulfillment of the *idea generation*. For example, the primary task is the contributing of the idea. Then, subsequent tasks of modifying or evaluating the idea are performed through posting comments and revisions. The decision to progress the idea to the next phase of the research process would be enacted possibly by a voting process or through endorsements by contributors. Additionally, administrative tasks supporting the CSS such as arranging related ideas within the CSS platform must be performed. Lastly, management of analytics about specific ideas produced is needed to measure contributor effort and interest level of the community.

Governance

A CSS platform that collects, evaluates, and ranks generated IS research ideas will naturally become a new front for the discussion of "what is research?" This, then, presents the question of "who decides?" Traditionally, journal editors and reviewers have been entrusted with gatekeeper roles. Depending on the CSS's governance model, similar power structures could be constructed for the crowdsourced genre. Alternatively, much more democratic governance models might form. These models would necessarily require the crowd's input for decision-making (e.g., crowd voting and crowd ranking).

Who will create and subsequently govern these CSS platforms? The most likely contenders are the existing institutions including the journal publishers (e.g., Palgrave MacMillan), associations (e.g., Association for Information Systems), or academic institutions.

Other, organizations could compete as well. For example, social networking sites (e.g., Facebook and LinkedIn) or niche academic social networking sites (e.g., Academia.org, Mendeley, and ResearchGate) could expand to serve as a platform for the entire research process.

People

In the AMCIS 2013 keynote address, Jeannie Ross stated "the germ of the idea is useful". She went on to advocate publication of 3-page, non-refereed, research-in-progress papers and fewer polished papers. However, that suggestion was quickly followed up with, "If you don't have tenure, ignore everything I just said" which drew emphatic laughter. The elephant in the room was that everyone acknowledged that researchers who are untenured must publish the longer, polished papers in peer-reviewed journals. In essence, the path to success requires conformity to the dominant journal-publication genre, so untenured researchers should disregard otherwise sound advice.

A similar sentiment was shared at the same conference in a panel discussion on the value of IS research (Hassan et al., 2013). One topic panelists discussed was whether IS research should focus on solving broader societal issues. During this discussion, a similar notion was put forth stating personal choices of research efforts must consider whether tenure had been attained. While I agree with both of these scholars' recommendations, they resonate on a higher level as well. They make us question whether the dominant genre is the best approach to scholarship for the IS community.

To be clear, the motivation here is not to question the merits of a tenure-based system. Rather, it is to point out that the current genre of research production, which has been shaped by

the reward system, is not serving us well if senior scholars suggest making a sharp turn in one's research efforts after obtaining tenure.

Technology

Technology has not traditionally played a significant role in the formation of research ideas. Its role is currently limited to accessing extant research literature and communicating research ideas amongst collaborators via email or videoconferencing. In the crowdsourced genre, technology's role is much more persistent and prominent. The *idea generation* problem can be addressed by using the crowd by combining the CSS functions of crowd creation and crowd voting. This enables the IS community to rank the ideas allowing the more interesting ones to emerge.

Following crowdsourced genre approach, the various CSS platforms will emerge as the de facto manifestation of the IS body of knowledge (Hirschheim & Klein, 2003). Furthermore, they will serve as the portals that provide access and structure to the IS research. Visualizations of explored ideas will assist in diagnosing underserved research domains.

Define Problem Phase

Problem and Outcome

The *problem* faced in the *define problem* phase is the refinement of the previously developed idea into specific research questions or hypotheses. Traditionally, this work effort has been performed similarly to that of the activities in the previous *idea generation* phase. Through mostly unstructured communications, research collaborators reach a general agreement of the specific research question(s) that they intend to investigate. Unfortunately, the problem and outcome are confined to the small collaborative group. Redirecting this problem to the crowd

would allow for more exhaustive vetting by the masses. As a result, better formations of truly important research challenges are possible.

So what are the most important challenges facing IS? This concept of IS grand challenges has recently garnered attention at IS conferences (Limayem et al., 2011) in IS literature (Winter & Butler, 2011; Hovorka & Corbett, 2012) as scholars continue to argue for collective attention to large-scale problems. Winter & Butler (2011) distinguishes grand challenges from incremental research efforts in that the grand challenges represent major advances in knowledge and require large collaborative efforts to achieve. These achievements often require decades of sustained research and are considered significant milestones in research advancement. For example, grand challenges such as landing a man on the moon as articulated by President Kennedy in 1961 and the mapping of the human genome competed in 2006 were successful due to the sustained, collaborative effort of many people.

The articulation of defined research problems, whether grand challenges or more narrowly focused efforts, are the *outcome* of this research phase. The resultant problem definitions are typically manifested as research questions or hypotheses. Furthermore, they explicitly frame the purpose of the subsequent research study. By enlisting the crowd, the efforts of the IS research community can be better directed thereby producing more relevant research.

Process Components

Task

Tasks associated with the refinement of ideas into *defined problems* are similar to ones in the preceding *idea generation* phase. The initial contribution of specific research questions or hypotheses will give rise to subsequent tasks such as modifying, rating, and commenting on the original submission. The accounting of contributor inputs and community interest exemplifies

major support tasks having continued relevance throughout the research lifecycle. Lastly, honed research problems will move forward to the next phase via tasks approving their merits.

Governance

Key governance issues at this point stem from the determining how the decision rights regarding the formation of the *problem* are allocated. The structuring of roles will determine the rights of contributors to participate in tasks such as contributing and revising newly defined problems. An evaluation process for submitting research problems requires management of roles such as commenting and ranking of submissions.

Another important governance question involves coordination of similar concurrently developing research problems. For instance, should multiple research questions be grouped into a single research project prior to advancing to the next phase? Also, when is it prudent for the project to progress to the *define procedures* phase?

People

When considering individual researcher's motivations, one must stress the importance of properly acknowledging contributions within the CSS platform. Hardaway (2005) makes the suggestion of date- and time-stamping of research contributions. This suggestion not only motivates people by crediting contributors, but also benefits the crowd by sharing the contribution. Additional crowd input will be required to properly evaluate the value of these contributions in order to assess the effort of individual researchers.

The crowd is likely to value the generation of an idea specific research question as a smaller contribution than a traditional publication. However, the IS academic community might view a significant, breakthrough idea more preferentially compared to a traditional publication

seen as mediocre. In either event, the structure of the reward system will undoubtedly factor into researchers' decision processes as they allocate their research efforts.

Technology

Wiki software can aide in the collaboration tasks required for submission and subsequently refinement of the research questions. Within the CSS platform, webpages dedicated to developing research questions would be hyperlinked to their respective *generated ideas* from the prior phase to provide structure to the CSS. Another critical component to the CSS technological infrastructure is supporting wiki pages such as the 'talk pages' in Wikipedia (Wikipedia, 2014). These pages facilitate the collaborative exchange of ideas necessary to produce the primary content.

Define Procedures Phase

Problem and Outcome

Once a specific *research problem* has been detailed, attention should be turned to determining the best set of *procedures* to investigate the problem. Procedural agreement on how the research problems will be addressed should be considered regarding approaches, methods, and techniques. First, research approaches outline the general, overarching way of going about the research. Examples of research approaches include language analysis, phenomenology, action-oriented, historical, and conceptual approaches. Second, methods represent how the research is carried out. IS research relies on many types of methods including case study, model building, lab experiments, ethnography, action research, and field research. Third, specific techniques that will be applied determine the actual tools that are necessary to compete the research execution (e.g., PLS, SEM, and NVivo). In addition to the aforementioned procedural

levels, theoretical choices must be agreed upon at this juncture if the research investigation will be theory-driven.

The achieved *outcome* in this phase shapes the research project into a completed research proposal. The primary strength the crowd offers here is an increased diversity of ideas and better vetting of ones contributed. Larger quantities of focused researcher effort will ultimately generate better outcomes than the traditional means of research production.

Process Components

Task

Tasks establishing procedures to guide the research *execution* involve making choices to best answer the research question from the previous phase. Agreement on the research approach, methods, and techniques must be established amongst the contributors. Additionally, decisions regarding the choice of theoretical lens are made at this point. Generally, tasks remain similar to the previous phases such as suggesting an initial set of procedures and modifying, evaluating, and commenting on the merits of them.

Governance

Questions posed in this phase are the same as those that surfaced in the previous phase. They primarily focus on the coordination of research procedures. For example, is it sensible for multiple sets of research procedure to go forward as single research project? If so, how should potentially conflicting findings be reconciled in the execution phase? Lastly, how and when should the project be deemed ready to move on to the next phase?

People

Traditionally, researchers have been confined to choosing *research procedures* that are in their skillset, deemed acceptable by the IS research community, and can be executed quickly.

These limiting factors curb the creativity of IS researchers and the relevancy of our research. While it is sensible for pragmatic researchers to choose *research procedures* that can efficiently get published, the larger knowledge creation endeavor suffers when we forego procedures that are better suited, yet consume more time.

The crowdsourced genre of research production is not beholden to these commonly followed assumptions. A crowdsourced research project would not necessarily be tied to an individual, so it would not suffer from the limitations of time pressure and procedural competency that research groups in the traditional genre face. Furthermore, research efforts leveraging the crowd's manpower could potentially generate several combinations of procedures to *execute* in parallel (e.g., mixed-methods research design).

Technology

The tasks of the first three phases all exist to mature research ideas into polished research proposals that are ready for execution. This commonality of purpose calls for common technological underpinnings to complete the phases. Here as well, technologies such as wikis facilitate crowd collaboration efforts to define procedures.

An already active CSS using wiki technology exists on AISNet to share and maintain theories used in IS research (Larsen et al., 2014). This site is indicative of how the *crowdsourced research genre* is already creating and disseminating fundamental elements of IS research. In the future, currently disparate elements such as this wiki will converge to not only inform the crowd, but also to assist in knowledge production.

Fund Research Phase

Problems and Outcomes

The *problem* faced in the *fund research* phase is to obtain financial support for research project expenses. Direct expenses include, but are not limited to, project-related costs such as equipment and software licenses. Traditionally, researcher salaries have been funded by other sources not necessarily tied to a specific project; however, it is possible for costs such as researcher salaries to be funded by a crowd of 'backers' as well. The resulting *outcome* of this phase is the funding of the aforementioned expenses. The impact of crowdsourcing this problem presents a significant shift in securing funds. It centralizes the collection efforts using the CSS platform, yet broadens the contributor base by engaging the crowd for donations.

Though the first three phases typically adhere to a sequential progression, research funding is obtained in concurrence with the previous processes or subsequent to their completion. The flexible nature of this process is resultant from the variety of funding sources and the specific circumstances under which the funding is obtained. However, for purposes of structuring discourse, it is appropriate to situate the *fund research* phase at this point.

The defining characteristic of this phase is the crowd contributes money rather than ideas. The act of crowdsourcing the funding of a project via direct contributions, known as *crowdfunding*, has generated much momentum recently. In 2013, Massolution released their industry report stating the volume of global crowdfunding dollars reached $2.67 billion in 2012 (Crowdsourcing.org). The reported volume was up 81% from 2011, and the volume was predicted to increase to $5.1 billion for 2013. The success of funding startup projects may be a harbinger for the future of research funding.

Process Components

Task

The primary task of this phase is raising the funds necessary to complete the research project. Depending on how the research project progressed through the preceding phases, researchers might need to perform supporting tasks to market their research ideas on a crowdfunding portal. These tasks might include the uploading of research project goals, desired budget, and planned resource allocation. Additionally, researchers should consider what, if any, incentives that backers will receive for their financial contributions.

Governance

Vetting of backers represents a key critical challenge that will ultimately affect how the research results will be perceived. Researcher neutrality will likely be questioned if the research project is directly funded in large part by corporations or special interest groups. Usage of a purely crowdfunded research funding model would potentially establish an infrastructure that enables organizations to channel money into research projects that promote their self-interests. While this is not altogether a negative prospect, one can see how projects funded by groups such as tobacco or soft drink lobbies could have questionable credibility.

A similar governance decision is required regarding rewards given to the backers. Project backers routinely receive incentives for their contributions to consumer-driven projects; however, crowdsourced research projects must weigh whether the rewards affect the neutrality of their findings. For example, the Georgia Tech Starter crowdfunding platform does not grant rewards to backers of its projects (Georgia Tech Starter, 2014).

People

Obtaining external funding such as grants is time consuming. The crowdsourced research genre allows larger numbers of researchers together on projects, allowing them to specialize in roles they self-select. Researchers with interests in raising money and managing research budgets would participate in the tasks necessary to solve the problem in this phase; others who are not interested are freed to focus on others areas of the research process.

Technology

The primary advantages technology brings to fundraising are convenience and efficiency. A webpage promoting the research projects goals is a significantly faster fundraising tool than a beaurcatic grant proposal process. Moreover, online money transfers enable quick payment transactions from multiple sources in the crowd.

A number of successful crowdfunding sites are already demonstrating the efficacy of raising money to fund projects such as Kickstarter, Indiegogo, and Crowdfunder. Since starting in 2009, over $1 billion in funding has been pledged by 5.7 million contributors using the Kickstarter platform (Kickstarter, 2014). More than half of that amount pledged was raised in the past year alone.

Although the concept of *crowdfunding* is rapidly gaining traction for consumer-driven projects, the crowdfunding of research projects remains in its infancy. Research universities that are early entrants into crowdfunding research are faced with the decision of how to manage the CSS platform. They can create and maintain the CSS infrastructure internally as Georgia Tech is currently doing. Georgia Tech Starter is the university's attempt to establish a crowdfunding platform from science and engineering research projects (Georgia Tech Starter, 2014). The site claims to be "the world's first peer-reviewed, university based crowdfunding platform".

Alternatively, some universities are pursuing partnerships with companies that host crowdfunding platforms. USEED is an online fundraising platform designed to "help [higher education] institutions advance their missions through innovative solutions that increase donor engagement and participation" (USEED, 2014). USEED currently is hosting projects from universities such as Arizona State University, Cornell, and University of Virginia. Similarly, Experiment.com has partnered with University of Washington and Tulane University School of Medicine to become a platform for connecting researchers' projects with backers interested in funding them (Experiment, 2014).

Execute Phase

Problems and Outcomes

The *problem* faced at this point is to conduct, or *execute*, the funded research proposal. Once the research questions have been investigated, the analyzed results are most typically communicated as a research article. They produce the project's manuscript, the tangible deliverable of the phase that communicates the research project's purpose and value.
In the traditional IS research publication genre, the *output* from the *execution* phase is a submission-ready manuscript. The research manuscript progresses to the next phase for peer-review *evaluation* by the journal or conference. However, the crowdsourced research genre could possibly blur the division between the *execute* and *evaluate* phases. Depending on the CSS platform's governance, *evaluations* could transpire concurrent to the manuscript's creation.

Process Components

Task

Generally, research *execution* tasks include collecting data, analyzing data, and reporting results. Preliminary support tasks may also be necessary such as procurement of equipment

required to conduct the project. The specific tasks in this phase vary depending on the type of research being performed as previously determined during the *define procedures* phase. For example, design science research generally creates an artefact during this phase; however, the primary mode of communicating the results is through the written manuscript.

Governance

Several governance questions at this point pertain to the handling of data. For example, who should manage the collection effort? Decisions are necessary to determine which contributors should be allowed to view the data. Also, how will data be protected if it is confidential? Another managerial decision is to determine whether only contributors who helped collect the data should be involved in analyzing it. Perhaps, different contributors should perform the analysis. Lastly, project members must make executive decisions about moving to the *evaluation* phase.

People

The length of time to complete the execution phase has traditionally been a looming factor in determining whether a research project is an attractive return-on-investment. This is evident when reviewing the proportion of IS studies that are cross-sectional (59%) versus longitudinal (33%) in nature. (Chen & Hirschheim, 2004). If time efficiency does impact research design decisions, then researchers face the ethical decision when the two factors are at odds.

Shifting to the crowdsourced genre's perspective, the *execution* tasks become decoupled from the researcher allowing for self-selection when focusing one's research effort. "The additional time required to refine a draft research document into a formal paper could be used to conduct additional research while leaving the opportunity for others with more of an interest in

writing to craft refined versions of the draft document. This provides the community with a way to collectively leverage its strengths." (Hardaway, 2005). Additionally, the genre allows for researchers to hone their contributions where they have the most expertise allowing others to pick up in areas they perhaps are not as deft.

Technology

Data collection and analysis efforts can be conducted with online survey software. Samples of participants crowdsourced through an online labor portal are more ethnically diverse and have more work experience compared to samples of university student participants (Behrend, Sharek, Meade, & Wiebe, 2011). Software-as-a-service (SaaS) technology can also be applied to statistical software packages to enable execution of the crowd's data analysis activities. Lastly, manuscript composition could be carried out by the crowd through use of wiki software.

Evaluate Phase

Problem and Outcome

The *problem* addressed in the *evaluate* phase in the traditional research genre is that the completed research study's manuscript needs to be vetted by independent, objective peers. Reviewers contribute their critical assessments and recommendations. If successful, the primary *outcome* of the *evaluate* phase is the revised, publishable version of the research manuscript. In the traditional publication genre, the manuscript is scheduled for publication at a future date according to the journal's release schedule. As mentioned in the previous phase, versions of the manuscript could be evaluated ad hoc in the crowdsourced research genre. This would create a blurring of the two phases and accelerate completion of the review process. Furthermore, draft

versions of the manuscript could be accessible prior to final publication to hasten the dissemination of the knowledge created.

While the research manuscript is obviously the featured deliverable of this phase, the contributed comments and criticisms are extremely valuable in their own right. These contributions should not be discounted. They represent a distinguishing characteristic that a CSS offers beyond the traditional genre's capabilities and will become relevant indicators in assessing scholars' contributions.

Process Components

Task

The essential tasks of the phase are to write reviews of the research project and help improve the manuscript. The additional task of deciding whether manuscript should be accepted for publication also will remain as in the traditional genre. However, the hope is that research projects that have matured to this phase will have undergone much more scrutiny and a significantly lower rejection rate.

Governance

The governance structure of reviewing in the crowdsourced genre will need to be established. The editorial decision rights and roles quite possibly could resemble the structure of journals today. In all likelihood, various CSS platforms will differ in their composition and allocation of rights pertaining to evaluation tasks. Depending on this structure, distribution of authority will either be concentrated among some members or a more egalitarian form may emerge.

People

In the AMCIS 2013 keynote, Ross also suggested performing group reviews. She commented that, "it's fun to review [as opposed to reviewing alone]. We can do this for every conference starting tomorrow. Make it a learning experience. It is a passion of mine." Her comments seemed well-received as though the consensus agreed the traditional peer-review process itself should be "reviewed".

The traditional research genre has suffered from a shortage of reviewers (Saunders, 2005). The reason, yet again, can be traced to the traditional reward system not adequately appreciating this form of researcher contribution. Perhaps reframing the review process to access the crowd can assist in expanding the reviewer base.

Technology

SwoonReads.com, a teen romance publishing company, solicits online manuscripts for potential publications from the crowd of authors. The crowd of readers determines top-rated manuscripts through online rankings, and the company publishes the refined manuscripts (Swoon Reads). The IS researcher crowd, too, could *evaluate* manuscripts on various categories. Perhaps, we can create an index appropriate for IS research similar to the *swoon index* which factors ratings of *heat*, *tears*, *laughs*, and *thrills* for romance manuscripts.

Publish Results Phase

Problem and Outcome

Since the approved research manuscript represents the *output* from the *evaluate* phase, the chief *problem* faced in the *publish results* phase is the dissemination of the manuscript and other supporting artefacts. The traditional genre, however, is fraught with barriers to this phase. A common limitation of *publishing results* is the constriction of the manuscript length to a

maximum word count. Moreover, the finite journal space limits the number of accepted research articles that can be published. In contrast, manuscripts in the crowdsourced research genre will not be susceptible to these constraints since the results are publishable online via the CSS platform. Manuscripts could also be released much quicker than the way the traditional genre batches them into issues.

The *outcome* of the *publish results* phase is the effective dissemination of knowledge produced by the research project. Traditionally, peer-reviewed publications appeared in hardcopy journals with outlets transitioning to make content accessible through electronic versions. However, journal access remains an issue for researchers due to the dominant subscription model. Other funding models allow researchers to pay for open access to their manuscripts. Crowdsourced research projects can overcome this hurdle as well by offering open access to manuscripts.

Process Components

Task

The act of *publishing* the results is greatly simplified in the crowdsourced genre being described. The published version of the manuscript could quite easily reside within the CSS that hosted the previous *execution* and *evaluation* phases. In this case, *publishing results* merely requires a simple changing of permissions so the manuscript becomes accessible to the public. While publication is the primary task performed, other tasks occurring at this point include the structuring of the manuscript repository and marketing of the manuscripts to promote awareness of their availability.

Governance

Several key governance questions in this phase relate to availability of the research deliverables. For instance, will the manuscript be freely accessible? In contrast to the traditional subscription model, journals are now offering *open access* options to research funders. This option allows funders to pay a publication fee in order to allow the article to be freely available to the public (e.g., Palgrave Open Article Processing Charge; Elsevier Open Access).

Another question to consider is at what point in the progression of the research project should it be 'published'? Since the manuscript has potentially been crowdsourced over the past few phases, it has likely progressed through an iterative *execution* and *evaluation* cycle growing from a rough draft into the polished manuscript. Governance decisions will dictate who has permission to view the manuscript at these various stages of drafting.

People

As previously noted, individual researcher productivity has traditionally been assessed through publication and citation counts. The crowdsourced genre fundamentally reconceptualizes the unit of measurement for researcher effort to *contributions*. This is a necessary change since it would be impractical to maintain the traditional publication counts as a metric when a crowd of authors is attached to many manuscripts. While it is not the focus of this discussion to propose any sort of specific productivity assessment system, I certainly recognize this issue as one of the most critical to overcome for the crowdsourcing genre to succeed.

Technology

A collaborative approach to structuring manuscripts can harness Web 2.0 technology for a more effective end result. This approach, referred to as *collective taxonomizing*, enables the document repository to decentralize the workload of organizing to the crowd (Wu, Gordon, &

Fan, 2010). Keywords tagged by the crowd enable fellow researchers to find the manuscript within the CSS.

Social networking technology is connecting researchers to one another and to research manuscripts of interest. Websites are proliferating to serve this function such as Academia.edu, Menedely.com, and ResearchGate.net. For instance, an IS History group formed on Menedely.com amassed 210 papers and 20 members in its first year (Zhang, 2013). Although these sites are billed as bringing together researchers, they are only a step closer to the crowdsourced genre since they do not currently equip the crowd of researchers to perform tasks discussed in this chapter.

Apply Results Phase

Problem and Outcome

The research process is completed by *applying results* in the final phase. The essential *problem* confronted here is the transfer of knowledge into contexts that other researchers and practitioners are facing. In order for research to be successfully applied, the consumers of the research must accept the findings as relevant, credible, and applicable to their situation. The *outcome* of this phase is the application of the results for other purposes. If research consumers deem research worthy of applying, their subsequent usage of the results will enhance a particular application (i.e., supporting the results). However, it is quite possible the applied results have no effect or even adverse effects in the given problem domain. In any course, the crowd can respond with much more feedback than is current practice.

Note that even research not typically considered *applied research* is still consumed by fellow researchers. When research contributions are primarily for fellow researchers, the outcome of this phase cycles into subsequent research projects continuing the advancement of

knowledge. The output contributes to further *idea generation* possibly helping define future *problems* or *procedures* in ensuing research studies. IS research has been stigmatized as lacking a cumulative tradition (Keen, 1980). Perhaps the infrastructure of the crowdsourced research genre will assist the IS research community to establish and demonstrate the cumulative nature of our research.

Process Components

Task

The task of this final phase is fundamentally different than the preceding phases since the purpose is to utilize the knowledge contributions that have been the focus up to now. In this phase, the application of the results is carried out in practical settings to solve real-world problems. Alternatively, the task is carried out by applying the results to further research. In either case, this phase is unique because the traditional genre already fulfills these tasks via the crowd.

However, discussion of manuscripts via online discussion threads is not currently practiced by IS journals. Research projects following the crowdsourced genre's approach could, however, incorporate this task into their lifecycles. The discourse subsequent to an article's publication can be insightful since it represents to IS community's reactions to the research project. The post-publication discourse itself should even be construed as an opportunity for contribution from IS community members.

Governance

The governance role in this phase is limited since it is unrealistic to attempt to control how the results are applied by consumers. Since the contribution of post-publication comments is being conceptualized as part of this phase, the governance issue of whether the CSS platform

will allow comments is warranted. If comments are incorporated into this phase, how should they be moderated?

While one would think that more scholarly discourse would be advantageous, it cannot be guaranteed. *Popular Science*, a magazine devoted to insightful science and technology news, recently discontinued its comment section beneath online news articles citing "trolls and spambots". The magazine's online content director claims "the cynical work of undermining bedrock scientific doctrine is now being done beneath our own stories" (LaBarre, 2013). While *Popular Science* is not a scholarly journal, the example does give pause when contemplating the role of online discourse regarding research manuscripts.

People

As researchers, we should more intentionally adopt the viewpoint that *applying results* is part of our job. Consider the following quote from Briggs, et al. (2011):

> *"The last research mile means using academic knowledge to solve real problems for real people with a real stake in the outcome. This is the definition of applied science/engineering. The last research mile is where academia creates value for society. It leads through rich country that can yield exciting exploratory, theoretical, experimental, and technical contributions".*

This sentiment truly captures the spirit of creating relevant research. Better organization of the researcher crowd and the practitioner crowd can increase opportunities for contribution in this regard. The crowdsourced genre can strengthen the feedback loop needed to connect this phase's outcomes with generating future research *ideas*.

Technology

Sprouts, an AISNet website for working papers, was designed to speed up the publication process by allowing researchers to share works-in-progress in lieu of slower, traditional outlets. It is another example of the transition from the traditional genre to the crowdsourced genre.

While the motivation for Sprouts is noble, the shifts in the reward structure for promotion and tenure are needed for the site to reach its true potential. When the IS community becomes more discerning evaluators of work effort, increases in contributions at venues such as Sprouts will follow that recognition.

DISCUSSION

The *crowdsourced research framework* offers several insights into the future of the *crowdsourced research genre*. The framework highlights that the *crowdsourced research genre* is not necessarily required for all research phases. Phases are decoupled, so a hybridization of the *traditional genre* and the *crowdsourced research genre* is foreseeable. For instance, researchers are currently supplementing the *traditional genre* by crowdsourcing surveys during the execution phase (Behrend et al., 2011). This trend is likely to persist even as the *crowdsourced research genre* continues to grow.

The *crowdsourced research framework* also illuminates that a number of aspects are applicable throughout the *general research process.* For example, researcher anonymity is a critical feature of the *traditional genre* especially in the *evaluation* phase when the double-blind reviewing takes place. Yet, a hallmark of the *traditional genre* is how it supports the recognition of individual scholarly contribution through publications and citations. While the *crowdsourced research genre* does not necessarily need to abdicate anonymity altogether, CSS platforms will need to track contributor involvement to assess individual's contributions.

The assessment of contributions presents an interesting paradox for the future of the *crowdsourced research genre.* Researchers are less likely to adopt aspects of the genre if the *traditional genre* does not reward such contributions, yet the transition to the *crowdsourced*

research genre will eventually facilitate superior metrics to assess scholarly contribution than we rely upon currently.

The *crowdsourced research framework* draws attention to the phase-specific features that are likely to contrast the two genres. For example, crowdfunding clearly represents a revolutionary change in the *fund research phase* that radically alters the way research projects are funded. Also, characteristics of the *crowdsourced research genre* such as *open access* to centrally stored manuscripts that more efficiently created and disseminated should accelerate the knowledge creation process. While certainly laudable, this should not be seen as the sole benefit from the genre. The 'metadata' collected over the course of the research process will preserve the story of the entire research process for future researchers beyond the capabilities of the *traditional genre*.

One last revelation that was brought to light while investigating the *crowdsourced research framework* deserves mentioning. The current research study is the recipient of the value created from a publication system that quickly publicizes research and grants open access. The Bukvova (2009) *general research model* guiding this study's framework is published on *Sprouts*. One cannot help but to wonder what form this study would have taken without Bukvova (2009) being published to an open access, working paper website. What if that paper had taken the *traditional genre's* path and not been completed? Or rejected? That research effort may have been in vain, and this current research effort would certainly have taken a divergent path.

LIMITATIONS

Though this research is intended to serve as a launching point for further discourse on the role of crowdsourcing in IS research, it does face some limitations. First, the reliance on a

general research model prevents nuances unique to some IS research endeavors from being addressed. Future research is encouraged that explores crowdsourcing's implications in regards to the variety of research approaches. Second, the task lists created for the discussion of each phase are not necessarily exhaustive. Further investigation into the tasks required should uncover a more comprehensive collection of work effort needed. It was beyond the intended scope of this research effort to perform an exhaustive investigation here. Rather, the goal here was to provide a more general discussion on impacts appearing throughout the research process.

CONCLUSION

As researchers, we must always remain open and receptive to new alternatives that might improve the generation of scientific knowledge. The emerging *crowdsourced research genre* has the potential to do this through creating and recognizing new, more specialized, contribution opportunities. Today we primarily operate in small collaborative groups constrained by the skillsets of their members. We focus our efforts on incremental improvements based on our individual strategic goals, but what about the strategic goals of the IS community? Is our current configuration the best to achieve those goals?

Since the *crowdsourced research genre* is already emerging in disparate tasks throughout the research process, it is inevitable that research landscape will radically change as they converge. This urges us to ask, which disciplines will lead in the construction of these artefacts, and which ones will be content conducting research on these artefacts after they are constructed? What position in Roger's DOI model will the IS research community occupy with respect to adopting the *crowdsourced research genre*?

As IS scholars, we are the ones to create this new system of scientific discovery. After all, we are the experts on 'information systems'; we are uniquely suited for this formative role of

shaping the future of scholarly research. To IS scholars seeking to add value outside of the IS discipline, this alternative research genre will serve as a model for other disciplines. IS researcher contributions made in this endeavor will reverberate outside the IS discipline, but only if the IS community takes action.

In conclusion, the quest for greater IS research production must dramatically reconsider notions of how we contribute and communicate results. Fundamentally, IS research is the generative process of socially constructing scientific knowledge. As we consider the future of IS scholarship, let's recognize that scholarly communications truly begin far in advance of the publication, or even submission of a manuscript. It is my sincere hope that this discourse broadens the IS community's mindset regarding the production of research and that it illuminates how future IS scholarship can be accomplished in the *crowdsourced research genre*.

CHAPTER 5. CONCLUSION

This dissertation advances the thesis that by strengthening our collective understanding of the IS discipline's historical traditions and current perceptions, IS scholars will be better positioned to positively impact the discipline's future. Looking over past research efforts, it is clear that IS scholarship is growing in terms of publication volume and thematic diversity accepted in mainstream IS journals. This diversification is likely to continue as information technology further blurs the boundary between the organizational and external environments. IS scholars should embrace the growth as a healthy evolution of the discipline.

Today, IS scholars' chief disciplinary concerns reflect issues that continue to circulate in the IS academic literature such as *distinction from other disciplines, focus of the discipline,* and *relevancy*. The proposed solution of creating an IS Body of Knowledge would directly confront the first two concerns noted. Furthermore, it would improve the *relevancy* of IS research efforts by establishing a conduit connecting the IS practitioner community to the IS academic community. Though deans cite similar top concerns as IS academics such as issues of *ill-defined/not distinguished from other disciplines* and *relevance*, they most often viewed *curriculum challenges* as a concern for the IS discipline. IS scholars should heed this finding as a reminder that we have obligations to serve the interests of other stakeholder groups whose priorities differ from a purely research-driven agenda we are often measured by. Furthermore, we should note that, as IS academics, we are typically more critical of our discipline than other groups such as business school deans.

What other takeaways come from this research? As the cliché goes, "identifying the problem is the first step". While several concerns of the IS discipline have been identified in Chapter 3, it is the IS community's challenge to take the next steps to overcome them. Moving

forward, we must seek out and embrace changes that will improve the impact of our scholarly efforts. This, in turn, will improve the *relevancy* of our research. It will ultimately define our identity.

This dissertation is certainly not the first call for change, nor will it be the last. A decade ago, in the 2004 ICIS Presidential Address, Richard Watson challenged the IS community to consider "alternative ways of operating the key elements of our community, and in the process, influencing the general academic community" (Gray et al., 2005). He went on to say that "we need to change our mindset from passive observers to active inventors", and in doing so, that we "should be inventors of the future". Watson's challenge enunciated a vision of how IS researchers can make the transition from the current dominant research genre and become the inventors of the future. Looking forward, we must consciously seek out alternatives that will proactively position ourselves as change agents of the future. Otherwise, we are left perpetuating the identity that is so concerning to us today.

Perhaps, we should adopt a disruptive change as fundamental as the proposed *crowdsourced research genre*. A change such as this could radically restructure how research output is generated. Will this emergent genre take hold en masse in the IS discipline? Will it extend broadly throughout academia? Perhaps it will. Or, will it simply flourish in a few, limited niche areas of the knowledge production process? It already has. Whatever the future holds for the genre, this phenomenon exemplifies how IS scholarship is constantly presented with opportunities to evolve. So, to fellow IS scholars, I conclude by reiterating Watson's challenge: let's dare to be "inventors of the future".

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APPENDIX A: LSA SYNONYM AND STOP WORD LISTS

Table 22: Synonym List

Child Term	Parent Term
b2b	business-to-business
b2c	business-to-consumer
behaviour	behavior
bpr	business process reengineering
cio	chief information officer
crm	customer relationship management
data base	database
decision-making	decision making
decision-support	decision support
ds	decision support
ebusiness	e-business
ecommerce	e-commerce
electronic commerce	e-commerce
electronic data interchange	edi
end-user	end user
erp	enterprise resource planning
ess	executive support system
gds	group decision support system
gdss	group decision support system
gss	group support system
hci	human-computer interaction
health care	healthcare
health_care	healthcare
high-level	high level
ict	information communication technology
information system development	information systems development
information systems department	IS department
interorganizational	inter-organizational
inter-personal	interpersonal
km	knowledge management
kms	knowledge management system
kbs	knowledge based system
knowledge-base	knowledge base
large-scale	large scale
life-cycle	life cycle
management information system	management information systems
market place	marketplace
market-place	marketplace
mis	management information systems
multidimensional	multi-dimensional
multilevel	multi-level
multi-media	multimedia
multinational	multi-national
open-source	open source

Table 22, continued.

organisation	organization
organisational	organizational
oss	open source software
p2p	peer-to-peer
resource base	resource-based
resource based	resource-based
tam	technology acceptance model
web site	website

Table 23: Stop Word List

Stop Word Terms			
One	Are	May	There
Two	As	No	Thus
Three	Be	Now	Too
Four	Being	Not	Typically
Five	Believe	On	Very
Six	Can	Paper	Volume
Seven	Do	Question	Within
Eight	Each	Refer	When
Nine	Et Al	Research Article	Where
Ten	Even	Seem	Why
First	Have	Several	_x000d_
Second	Here	Special	D
Third	How	Special Issue	E
Fourth	In	So	I
Fifth	In Particular	Study	G
About	Information System	Such	S
Abstract	Information Systems	That	U
All	Issue	The	
Also	Journal	This	
An	Keyword	Then	

APPENDIX B: CLUSTER ANALYSIS TOPICS (1977-2013)

ID	Cluster Name	Descriptive Terms	#	%
9	Implementation/ Value/Performance	+business +firm +implementation +value benefits firms processes +process +performance +management	674	12%
18	Projects/ Management	+project +user factors perceived users +system +management model projects findings	624	11%
5	Methodology	data modeling models requirements methods +approach +design +analysis used +decision	585	11%
12	IT Communications	'information technology' +'information technology' +communication +information +technology information social technologies technology networks	554	10%
3	IS Discipline	+discipline +field methods researchers some +theory critical +practice +design +work	416	8%
8	Software Development	'software development' 'systems development' +development +project +software engineering projects requirements methods systems	384	7%
1	Consumers: Service/Quality	+consumer +market +network +quality +service consumers internet networks pricing services	373	7%
4	Strategy/ Competitive Advantage	'strategic information systems' +'competitive advantage' +advantage +business +strategy alignment competitive planning strategic +'information technology'	321	6%
15	Knowledge Management	'knowledge management' knowledge organizational processes +practice organizations +organization +work +task different	310	6%
7	E-commerce	'electronic commerce' +consumer +e-commerce +product +trust +web consumers online perceived effects	186	3%
17	Adoption/ Innovation Diffusion	+adoption +innovation diffusion factors innovations +influence organizational +technology organizations model	183	3%
6	Group Support Systems	'group support systems' +'decision support' +group +meeting +support +task electronic group groups gss	158	3%
16	Electronic Markets	'electronic markets' +auction +market +price auctions electronic markets online prices pricing	155	3%
2	Decision Support Systems	'decision support systems' +'decision making' +'decision support' +decision +system decision-making dss systems +support +design	154	3%
14	Outsourcing	+client +contract +cost contracts outsourcing vendor services costs firms +service	133	2%
10	Organizational Learning	'organizational learning' +learning learning training organizational methods +system knowledge models +development	113	2%
13	Virtual Teams	'virtual teams' +team +trust distributed members team teams virtual +collaboration +communication	102	2%
11	Researcher Profiles	'claudio ciborra' 'department of information' 'london school of economics' +department +school chair ciborra claudio economics england	33	1%

APPENDIX C: CLASSIFICATION ANALYSIS TOPICS (1977-2013)

ID	Topic Name	Topic Description	# Terms	# Docs
3	IT Innovation/Adoption	+technology,+information,+innovation,+information technology,+adoption	208	889
1	Methodology	+method,+approach,+analysis,+design,+system	244	875
6	Management	+management,+information,+organization,+management information systems,+user	209	853
2	User Adoption	+user,model,+perceive,+intention,+adoption	210	741
9	Implementation/ERP	+implementation,+project,+system,+enterprise resource planning,+success	187	730
13	DSS	+system,+user,+decision support,+design,+decision support system	138	714
18	Service/Quality	+service,+quality,+business,+customer,+service	176	687
7	Strategy/Competitive/Planning	strategic,+strategy,+business,competitive,+plan	152	686
5	Performance/Investment/Value	+performance,+investment,+firm,+value,firm	192	638
11	Software Development	+software,+development,+project,software development,+system development	125	637
17	Social Network	+network,social,+communication,+network,+social network	169	634
14	Knowledge Management	knowledge,organizational,knowledge management,+learning,+share	161	626
15	Electronic Market/Supply Chain	electronic,+market,+chain,+supply,+system	183	622
12	Outsourcing	outsourcing,+risk,+project,+contract,+decision	183	602
4	Online Market	+consumer,online,+market,+product,+price	206	599
8	GSS	+group,+support,+group support system,+group support system,+task	149	487
16	Researcher Profiles	claudio,claudio,+school,+department,ciborra	201	449
10	Virtual Team	virtual,+team,team,+virtual team,+trust	149	439

APPENDIX D: CLUSTER ANALYSES PER TIME PERIOD

Period 1: 1977-1984

ID	Name	Descriptive Terms	Frequency	Percentage
1	Systems Development	'systems development' +role +development +project +approach +system +implementation +process systems describes	41	25%
2	DSS	'decision support systems' 'decision support' +'decision support system' +analysis systems activities +system +need +design information	37	23%
3	Data Processing	+technology data processing +computer organizations some +organization information +new +application	38	23%
4	MIS Design	designs +design managers mis problems +'management information systems' needs organizational +organization most	32	20%
5	Planning	planning identifying identified +process +identify techniques describes mis using based	15	9%

Period 2: 1985-1989

ID	Name	Descriptive Terms	Frequency	Percentage
1	IT Development	+'information technology' +technology technology +development 'information technology' +group software information implementation +decision	213	49%
2	Database	data +database +control computers +computer most knowledge +approach new processing	75	17%
3	Planning/Strategy/ Success	mis planning end-user computing +success importance organizational managers +analysis strategic	72	17%
4	DSS	'decision support systems' 'decision support' systems +'decision support system' +system decisions +'decision making' model support +decision	43	10%
5	IT Management	review reviews information 'information technology' managing technology +review +company +analysis software	33	8%

Period 3: 1990-1994

ID	Name	Descriptive Terms	Frequency	Percentage
1	Software Development	problems +development software organizational +approach individual +change factors processes more	221	33%
2	Competitive Advantage/ Strategy	+'competitive advantage' +advantage competitive +'information technology' strategic +technology +industry +business +strategy firms	131	20%
3	Planning/ Strategic Management	planning management strategic executives +role +framework managers +strategy +organization managing	52	8%
4	User Satisfaction	computing end-user satisfaction mis +computer professionals learning individual +user users	49	7%
5	DSS/GDSS	'decision support' 'group decision support' +group +meeting meetings electronic systems groups support +interaction	47	7%
6	Database	+database databases +user +design +method models +analysis methods +system used	43	6%
7	Expert Knowledge	expert knowledge +acquisition systems +system +task learning models +use problems	40	6%
8	IT Value	'information technology' information technology +technology +value +'information technology' strategic competitive reviews +number	43	6%
9	IT Investment/ Evaluation	investments review +investment +evaluation reviews evaluating +area managing +work +impact	36	5%

Period 4: 1995-1999

ID	Name	Descriptive Terms	Frequency	Percentage
1	Organizational Change	+change organizational +business +organization processes organizations +role work management +'information technology'	344	42%
2	Methodology	+method +approach methods +methodology +design +problem approaches knowledge +application +use	99	12%
3	Users	+user training models users factors software model empirical +computer +performance	94	12%
4	Outsourcing	+market markets outsourcing +service +cost firms services competitive electronic companies	92	11%
5	IT Investment/ Impact	reviews information technology 'information technology' +'information technology' +technology investments +impact +investment companies	60	7%
6	Project/Risk Management	+project projects +risk management software +development describes approaches +success managers	43	5%
7	GSS	'group support systems' +group group groups gss support +meeting systems members +task	43	5%
8	Planning/Strategy	planning strategic 'strategic information systems' alignment +business +strategy +success critical information companies	41	5%

Period 5: 2000-2004

ID	Name	Descriptive Terms	Frequency	Percentage
1	Quality/ Performance	data empirical services +task significant findings +quality +experiment using +performance	130	14%
2	IT Innovation/ Adoption	'information technology' +innovation computing technologies technology information +technology social +'information technology' +adoption	129	14%
3	Methodology	+design +approach +methodology +process systems +framework +work +development +set based	126	14%
4	Implementation	+implementation erp projects +project +organization +process +system organizational +development management	98	11%
5	Technology Acceptance Model	+'technology acceptance model' +consumer consumers trust online web 'electronic commerce' +behavior electronic +market	86	10%
6	Project Teams	+project +team projects teams virtual software members +behavior +control trust	68	8%
7	Knowledge Management	'knowledge management' knowledge organizational focuses +support +practice learning processes management +process	65	7%
8	Business Value/ Investment	'business value' +investment +value firm firms investments +firm +technology +performance information	64	7%
9	Strategy/ Competitive Advantage	+strategy competitive 'competitive advantage' strategic alignment +advantage strategies markets +business +market	53	6%
10	IS Discipline	+discipline +field disciplines researchers core reviews +future more +focus +time	44	5%
11	GSS	'group support systems' +group groups +support +idea systems +experiment collaborative +quality +task	37	4%

Period 6: 2005-2009

ID	Name	Descriptive Terms	Frequency	Percentage
1	Methodology	+field researchers +design +approach +practice +theory critical +work +analysis +number	180	14%
2	IT Implementation	'information technology' +implementation +change organizational technology +'information technology' +technology information +information +organization	157	12%
3	Business Value/ Performance/ Benefits	+chain erp +value +firm firms +business +performance +implementation benefits +system	142	11%
4	Acceptance/ Adoption/Use	+intention acceptance behavioral perceived +user +adoption users model +use +influence	94	7%
5	Measuring Quality/Performance	modeling models +measure conceptual measures using +approach +quality +performance +task	91	7%
6	Standards/Policy	standards +network effects social policies diffusion +market firms +technology +world	80	6%
7	Software Development	'software development' +development +project +software agile projects teams managers distributed team	80	6%
8	Knowledge Management	'knowledge management' knowledge organizations organizational processes implications +develop +management +process +organization	80	6%
9	Virtual Teams	'virtual teams' +team members team teams virtual +communication +collaboration distributed +group	60	5%
10	E-commerce: Consumer	+consumer +product consumers online products +e-commerce internet web 'electronic commerce' +experience	58	4%
11	Outsourcing	+cost offshore outsourcing vendor projects costs services +firm firms +risk	55	4%
12	E-commerce: Price	+price +seller markets online prices pricing sellers +market internet electronic	53	4%
13	Mobile/Innovation/ Adoption	mobile +innovation diffusion +adoption technology 'information technology' services technologies information +network	50	4%
14	E-commerce: Trust	+trust trust 'electronic commerce' online +e-commerce web perceived +consumer +intention internet	41	3%
15	Government	+government +sector e-government public +adoption projects electronic benefits +project diffusion	38	3%
16	Researcher Profile	'claudio ciborra' 'department of information' 'london school of economics' +department +school chair ciborra claudio economics england	33	2%
17	Security/Risk	+security security policies +risk organizations +number economics managers +organization +level	29	2%

Period 7: 2010-2013

ID	Name	Descriptive Terms	Frequency	Percentage
1	Use/Adoption	+user models modeling users +system model +use cognitive +adoption using	146	13%
2	Project Management	+project projects software +control +development +implementation systems practices management +system	103	9%
3	Social Networks	'social networks' +network media networks social online members individuals +communication +show	100	9%
4	Methodology	methods researchers +field +method theories +approach approaches +design +theory +view	98	8%
5	Online Markets: Product	+product online products consumers +consumer software +market +price markets +effect	75	6%
6	Outsourcing	outsourcing firms benefits +industry +business +'information technology' information services +value +firm	72	6%
7	Online Markets: Price	+price markets prices pricing +search +market internet +design electronic online	68	6%
8	Performance	+firm firms firm +performance +'information technology' +business strategic competitive +value +impact	64	6%
9	Organizational Implementation/ Change	institutional public +change +implementation practices +policy +perspective +technology information organizational	64	6%
10	Communication Technology	'communication technologies' +'communication technology' +communication ict technologies +technology future information +field importance	55	5%
11	Service/Quality	+service services providers +quality +market +consumer online markets +price prices	53	5%
12	Strategy/ Competitive Advantage/Value	alignment strategic +strategy competitive +business +advantage +value +firm organizational +focus	52	4%
13	Teams/ Collaboration	+team team teams +collaboration members cognitive knowledge virtual +performance +work	52	4%
14	Innovation/ Adoption	+innovation innovations +adoption existing processes firms institutional internet environments +examine	41	4%
15	Virtual Worlds	'virtual worlds' +'virtual world' +world virtual worlds +life environments users individuals +collaboration	36	3%
14	Security/ Compliance	+security security compliance +policy information organizations +behavior organizational approaches factors	36	3%
15	Privacy	concerns privacy personal consumers online information individuals +policy +control users	27	2%
16	Supply Chain	+chain supply global +identify +view +industry management benefits +value empirical	18	2%

APPENDIX E: SOCIAL REPRESENTATIONS OF THE IS DISCIPLINE EXAMPLES

Table 24: IS Academic Social Representations of the IS Discipline

Topic ID	IS Representation Topic	Example Response
RA1	IT	Emerging information technologies exploiting technology ICTs information technology IT artifact technical IT and business alignment technology
RA2	business	Business organizational change organizational computing organizational impacts of IT organization central to businesses
RA3	computers	computer Computer hardware Computer software Computer technology computer technology in action computers in business computing networks
RA4	research	DeLone and McLean investigation of how and why IT innovations are accepted, deployed and adapted over time by people, organizations and societies. qualitative and quantitative analysis of information systems academic research not as useful as it could be Behavioral Research behaviorial empirical research long review processes MISQ
RA5	use	accessibility Performance effective use of information Efficiency Efficiency use of technology Technology Acceptance
RA6	information systems	dissemination of knowledge about information systems Information Systems Development Methodologies business information systems business systems Management Information Systems MIS

Table 24, continued.

RA7	management	management management of software development processes managing information management of information technology requires management competences
RA8	development	Development development and deployment of computerized business applications Development of IT based organizational systems systems development life cycle System Development
RA9	analysis/design	analysis of business problems analysis & design system analysis system analysis and design Conceptual model design design of software
RA10	socio-technical systems	humans in society and orgnaisation and information technology humans interacting with systems Interface between IT, people and organization
RA11	misunderstood	lacks a marketing focus to tell our story neglected Not very cutting edge - not easy to "sell" to new students notorious IS identity crisis (and an associated debate between rigour and relevance) people outside the discipline don't know what it is perceptions senseless sorry struggling under-appreciated
RA12	people	analysts business analyst IS personnel People people and IT people and technology
RA13	adding value	business value of information systems adding value to the organization, strategic advantage value return on investment for IT

Table 24, continued.

RA14	processes	Business Process Development business processes clinical process improvement of business processes Process Process processes rules and alerts
RA15	information	Access to useful information information
RA16	problem solving	business problem solving problem solving solving business problems solving problems understanding of complexity understanding of integration
RA17	data/databases	data data centers Database Design and Exploitation Database
RA18	innovation	digital innovation and design enabling innovation innovation
RA19	software	application software software software engineering programming
RA20	collaboration	Collaboration communication communication and collaboration integrator Team Collaboration virtual teams
RA21	networks	Internet network security
RA22	decision support	decision support decision support systems decision making
RA23	relevancy	dying failure featureless Journals that are run by people interested only in theory that is irrelevant to business. Too much theory that is irrelevant to business.
RA24	interdisciplinary	interdisciplinary multidisciplinary supporting other disciplines

Table 24, continued.

RA25	dynamic	Action always changing dynamic dynamic; ever changing/evolving Future
RA26	change	change is just for a great paradigm change
RA27	implementation	adoption implementation
RA28	diverse	eclectic Complicated challenge of dealing with technology, information and people broad complex diverse research providing alternative views
RA29	service	Content Customer service digital products services
RA30	project management	project management projects
RA31	applications	applications business applications
RA32	focus of the discipline	explanation oriented is not computer science Less technical than Computer Science
RA33	analytics	business intelligence and analytics
RA34	application areas	electronic commerce ERP knowledge management workflow
RA35	users	users
RA36	outsourcing	outsourcing
RA37	disciplinary criticism	geeky low reputation narrow framing
RA38	alignment	business IT alignment
RA39	exciting	exciting exciting career
RA40	jobs	hiring opportunities hot field for graduates
RA41	deployment	deployment
RA42	expensive	large expenses
RA43	student demand	challenged by enrollments (in universities)

Table 25: Dean Social Representations of the IS Discipline

Topic ID	IS Representation Topic	Example Response
RD1	IT	hardware Information Technology IT IT management newer technologies Technology
RD2	application areas	accounting systems AIS auditing Backbone of social media Cloud Customer Relationship Management System cyber security End user technology enterprise management ERP ERP Excel
RD3	data/databases	Data database databases data capturing data management Data management Data processing
RD4	skills	Compliance auditing Computer security consulting internal control IT literacy Key business tools organization skills Problem Solving
RD5	computers	computer computer programming Computer technology computers
RD6	job market demand	Challenging to find faculty qualified and current in field employment opportunities fear of outsourcing Great jobs highly demanded by industry in demand In Demand IT Jobs Job market fluctuations relatively large
RD7	software	Applications applications of computer systems computer languages Operating Systems Software

Table 25, continued.

RD8	business	applied business business analysis business analytics Business Driven business meets technology
RD9	analysis/design	analysis and design Analytical Analytical development in students
RD10	misunderstood	Computer people who have trouble speaking in a language other people understand Defensive don't know what it is Lost misunderstood Not understood nothing comes to mind Overhyped Seen as service dept by peers Unappreciated by students uncertain Under-valued what is it
RD11	management	change management Computer management management systems managing data
RD12	essential	Critical Essential Imperative Important Mission-critical to business necessary useful
RD13	information systems	Business systems Computer Information Systems Informatics Management Information Systems MIS
RD14	analytics	Analytics Big data Business Intelligence Data analytics
RD15	curriculum issues	Challenging curriculum CIS faculty cannot make IS interesting for students Courses in technology and information support demanding Improper curricular development

Table 25, continued.

RD16	fit with other disciplines	connected to all parts of the organization divisional assignment difficult interdisciplinary Need potential integration with accounting information systems Needs better integration with other business disciplines Not well positioned orphanned
RD17	networks	Computer networks general infrastructure Infrastructure Internet Networking Networks
RD18	disciplinary misperception	computer science
RD19	disciplinary criticism	A field that has no clarity Backward-looking Big brother computer techie Cyber area and its management is far too distributed across academic disciplines for "techies" Geeks ill-defined
RD20	dynamic	constantly change field Cutting Edge dynamic Evolving transformation
RD21	information	link between data and insight information analysis
RD22	use	Productivity vs Overload systems improvement systems improvements ubiquitous
RD23	alignment	alignment IT Strategy
RD24	technical	technical technical discipline technical specialty
RD25	processes	Studies Compliance auditing
RD26	decision support	Decision making decision support Decision systems Decisions
RD27	dying field	Dated Dying as an academic field in business Eliminated 4 years ago.
RD28	ill-defined	No unique body of knowledge. Not well defined poorly defined

Table 25, continued.

RD29	n/a	Department Major School Information System School wide infrastructure is horrible
RD30	innovation	Innovation Innovative
RD31	research	Great new research soft discipline Studies
RD32	enrollment	Demand low enrollments MIS lacks students
RD33	challenging	Hard requires fortitude
RD34	support	support
RD35	collaboration	team Coordination
RD36	expensive	Costly in terms of fewer students in focus area expensive
RD37	absorbing in other disciplines	Being absorbed into other disciplines Easy to embed function is other core disciplines
RD38	exciting	Exciting
RD39	diverse	complex Very broad

APPENDIX F: CONCERNS OF THE IS DISCIPLINE EXAMPLES

Table 26: IS Academic Responses to Concerns of the IS Discipline

Topic ID	Concern Topic	Example Concern Response
TA1	distinction from other disciplines	confusion about difference between IS, CIS, Information Science and other names for what constitutes our "discipline"
TA2	focus of the discipline	management topics are mostly missed; too strong technology focus
TA3	relevancy	I fall on the side of increasing relevance of research; I don't necessarily think this has to be done at the expense of rigor
TA4	research focus	Most eminent IT scholars do behavioral research rather engineering/design research
TA5	introspection/self-appraisal issues	We are too negative in thinking about ourselves
TA6	journal publication process	Average review time for journals paper is very long
TA7	showing value to outsiders	Unable to articulate its importance to others
TA8	teaching and curriculum challenges	Lack of clear AACSB guidance that IS / IT MUST be in the curriculum
TA9	absorbing into other disciplines	IS embeddedness in every other discipline - do we really need IT?
TA10	research diversity	Way too much diversity
TA11	workforce labor issues - faculty	aging professoriate
TA12	assessing contributions within academic IS field	little honoring of conferences that might in fact be better outlets for publications than journals in some cases
TA13	research methodology	strong dominance of factor models and survey methods
TA14	keeping up with technology	inability to keep up with technology developments
TA15	lack of respect/importance	We have little respect from our business school colleagues
TA16	misunderstood	Students have no idea what an MIS degree is, and their parents don't know either
TA17	workforce labor issues - students	lack of marketing the great opportunities in information systems for students
TA18	enrollment/recruiting	student enrollment
TA19	financial/funding	budget cuts
TA20	lack of premier journals	Only 2 A journals
TA21	US dominance	strong dominance of North America

Table 27: Dean Responses to Concerns of the IS Discipline

Topic ID	Concern Topic	Example Concern Response
TD1	curriculum issues	instruction tends to focus on technical aspects
TD2	ill-defined/not distinguished from other disciplines	Clearer distinction with computer science/engineering
TD3	relevance	Hard for faculty to stay on the cutting edge of a continuously changing discipline
TD4	marketing of discipline	Program director and department chairs are not the best evangelists for their programs / departments
TD5	limited quality faculty	Not enough faculty availability of the quality we want
TD6	research quality	soft IS is overcrowded and adds little value
TD7	focus of the discipline	Having a holistic perspective
TD8	collaborating/fit with other disciplines	Trying to take advantage of synergies between MIS and schools of computer science
TD9	enrollment	declining enrollments
TD10	expenses	Equipment to properly support programs can be expensive on tight budgets
TD11	research focus	focus on academics as target audience
TD12	jobs	seems like jobs can be easily offshored

APPENDIX G: CROWDSOURCED RESEARCH FRAMEWORK

<table>
<tr><th>Research Phase</th><th>Problems/ Outcomes</th><th></th><th>Crowdsourcing Process</th></tr>
<tr><td rowspan="2">1. Generate Idea</td><td>What research area and topic will be investigated?</td><td>=></td><td rowspan="2"><u>Tasks</u>
Contribute idea
Modify idea
Evaluate/Comment on idea
Rank/Vote on ideas
Arrange ideas
<u>Governance</u>
What is considered Information Systems research?
When is the idea ready to move to the define problem phase?

<u>People</u>
Problem Owner: Needs vetting of idea from the crowd to determine whether appropriate (novelty, relevance).
Crowd: Offers critiques, refinement, and acceptance of the research idea in larger numbers than otherwise received.

<u>Technology</u>
Wikis (idea development, discussion)
Online Rating (e.g., Amazon, eBay, TripAdvisor)
Web Analytics (number of views, contributors, ideas contributed, comments, likes/dislikes)
Collective Taxonomy</td></tr>
<tr><td>Research topics

Contributions to the IS Body of Knowledge</td><td><=</td></tr>
<tr><td rowspan="2">2. Define Problem</td><td>What specific research problems will be investigated within this idea?</td><td>=></td><td rowspan="2"><u>Tasks</u>
Contribute research questions/hypotheses.
Modify research questions/hypotheses
Evaluate/Comment on research questions/hypotheses
Rank/Vote on research questions/hypotheses
Arrange research questions/hypotheses

<u>Governance</u>
Is the defined problem sufficiently different than previous problems?
Is it relevant and worthy of investigation?
When is the problem ready to move to the define procedures phase?

<u>People</u>
Problem Owner: Needs vetting of specific research problem by the crowd to determine whether appropriate (novelty, relevance).
Crowd: Offers critiques, refinement, and acceptance of the research problem in larger numbers than otherwise received.
<u>Technology</u>
Wikis (problem development, discussion)
Online Rating
Web Analytics (number of views, contributors, problems contributed, comments, likes/dislikes)
Collective Taxonomy</td></tr>
<tr><td>Research questions and/or hypotheses.</td><td><=</td></tr>
</table>

3. Define Procedures	What procedural underpinnings will guide the research investigation?	=>	<u>Tasks</u> Choose approaches. Choose methods. Choose techniques. Choose theoretical lens. (if theory-driven) <u>Governance</u> Should multiple procedural underpinnings progress to the *execution* phase separately? How and when is it determined that the project is ready to move to the *funding* phase? <u>People</u> Problem Owner: Needs specific research *procedures* from the crowd to determine to execute the research. Crowd: Offers solutions, critiques, refinement, and acceptance of the *research procedures*. <u>Technology</u> Wikis (procedures development, discussion) Online Rating Web Analytics (number of views, contributors, comments, likes/dislikes) Collective Taxonomy
	A set of procedural underpinnings (i.e., a group of approaches, methods, techniques, theories).	<=	
4. Fund Research	What needs funding to complete the research? What funding sources are available for the research? Is the funding source willing to fund the research project?	=>	<u>Tasks</u> Create research project budget. Promote project to possible backer. Raise capital to fund research project. <u>Governance</u> What is an appropriate budget for the project? Should backers be vetted? Should backers receive 'rewards'? When is the project ready to move to the *execution* phase? <u>People</u> Problem Owner: Needs funds to execute the research project. Crowd: Acts as the funding source. <u>Technology</u> Online payment systems Web Analytics (number of views, backers, comments) Kickstarter, Indiegogo, Crowdfunder Georgia Tech Starter, Experiment.com, USEED.org
	Project's budget Target funding source identified Funding request approved/project funded	<=	

5. Execute	What equipment, approvals, access is needed to conduct the research? What data needs collecting? What does the data say? How will the results be communicated?	=>	<u>Tasks</u> Procure hardware, software, licenses, etc. Collect data. Analyze/Interpret data. Report findings via manuscript. <u>Governance</u> Who has purchasing authority? How will data collection be managed? Who is allowed to access data that has been collected? How will confidential data be protected? Should contributors other than the ones collecting the data be allowed (or required) to analyze the data? When is the project ready to move to the *evaluation* phase?
	Equipment, approvals, and access obtained Data collected Data analyzed Manuscript written/submitted	<=	<u>People</u> Problem Owner: Needs research project carried out and reported. Crowd: Completes the activities necessary to successfully execute the research and report its findings. <u>Technology</u> SaaS for data collection, statistical analysis, qualitative analysis. Wikis (manuscript development, discussion) Web Analytics (number of views, contributors, comments, likes/dislikes)
6. Evaluate	Is the submitted research well motivated, well executed, and well written?	=>	<u>Tasks</u> Write reviews of research project and manuscript. Revise manuscript per reviewer comments. Decide whether manuscript is publishable (i.e., accept, revise/resubmit, reject). <u>Governance</u> What controls guide the evaluation and revision of research? (i.e., who decides and how are decisions determined regarding completion) When is the project ready to move to the *publication* phase?
	Decision on the status of the manuscript. Comments in response to the manuscript.	<=	<u>People</u> Problem Owner: Needs the *executed* research critically *evaluated* by the crowd. Crowd: Performs the activities of peer-reviewing the research project's deliverables. <u>Technology</u> Wikis (manuscript development, discussion) Online Rating Web Analytics (number of views, contributors) SwoonReads.com

7. Publish Results	How, when, and where will the results of the accepted manuscript be made available?	=>	<u>Tasks</u> Schedule publication of manuscript. Make published manuscript available. Promote the availability of research manuscript. <u>Governance</u> Who owns the intellectual property rights? Subscription or open access model? At what point is the draft viewable to people not collaborating? Should the manuscript be published in batch with other similar manuscripts or ad hoc? <u>People</u> Problem Owner: Needs to communicate the results of the research project. Crowd: Coordinates the scheduling, publication, and promotion of the manuscript. <u>Technology</u> Social networking software Web Analytics (# of views, comments, likes/dislikes, citations) Academia.edu, Mendeley.com, ResearchGate.net
	Published results of the research study are made available.	<=	
8. Apply Results	Are the results applicable to other researchers or practitioners?	=>	<u>Tasks</u> Apply results to practice. Apply results to subsequent research efforts. <u>Governance</u> Should readers be able to comments on publications? How long should discussion of applying results continue? <u>People</u> Problem Owner: Needs the research to be applied by target audience. Crowd: Serves as the consumers of the research and provide feedback regarding the value of the research. <u>Technology</u> Social networking software Online discussion forums (discussion of manuscript) Wikis (discussion of cases applying results) Online Rating Web Analytics (views, comments, likes/dislikes, citations)
	Results are applied or tested in subsequent research projects. Results are supported or refuted when applied to practice. Results are stronger/weaker than other approaches.	<=	

APPENDIX H: IRB APPROVAL

Application for Exemption from Institutional Oversight

Institutional Review Board
Dr. Robert Mathews, Chair
131 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.6792
irb@lsu.edu
lsu.edu/irb

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/ projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

– Applicant,Please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at http://research.lsu.edu/CompliancePolicIesProcedures/InstitutionalReviewBoard%28IRB%29/item24737.html

– A Complete Application Includes All of the Following:
(A) Two copies of this completed form and two copies of part B thru E.
(B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
(C) Copies of all instruments to be used.
*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
(D) The consent form that you will use in the study (see part 3 for more information.)
(E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (http://phrp.nihtraining.com/users/login.php)
(F) IRB Security of Data Agreement: (http://research.lsu.edu/files/item26774.pdf)

1) Principal Investigator: RUDY HIRSCHHEIM **Rank:** PROFESSOR

Dept: ISDS **Ph:** 578-2514 **E-mail:** RUDY@LSU.EDU

2) Co Investigator(s): please include department, rank, phone and e-mail for each
*If student, please identify and name supervising professor in this space

JAMES LOVE, ISDS, PhD Candidate 336.543-7777 JLOVE8@LSU.EDU (SUPERVISING PROF - RUDY HIRSCHHEIM)

IRB# E6066 (1) Proposal
✓ Consent / Information
✓ Human Subjects Training

3) Project Title: SOCIAL REPRESENTATIONS OF THE INFORMATION SYSTEMS DISCIPLINE

Study Exempted By:
Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/irb
Exemption Expires: 8/23/2015

4) Proposal? (yes or no) NO **If Yes, LSU Proposal Number**

Also, if YES, either ○ **This application completely matches the scope of work in the grant**
OR ○ **More IRB Applications will be filed later**

5) Subject pool (e.g. Psychology students) UNIVERSITY ADMINISTRATORS, IS RESEARCHERS, IT PROFESSIONALS

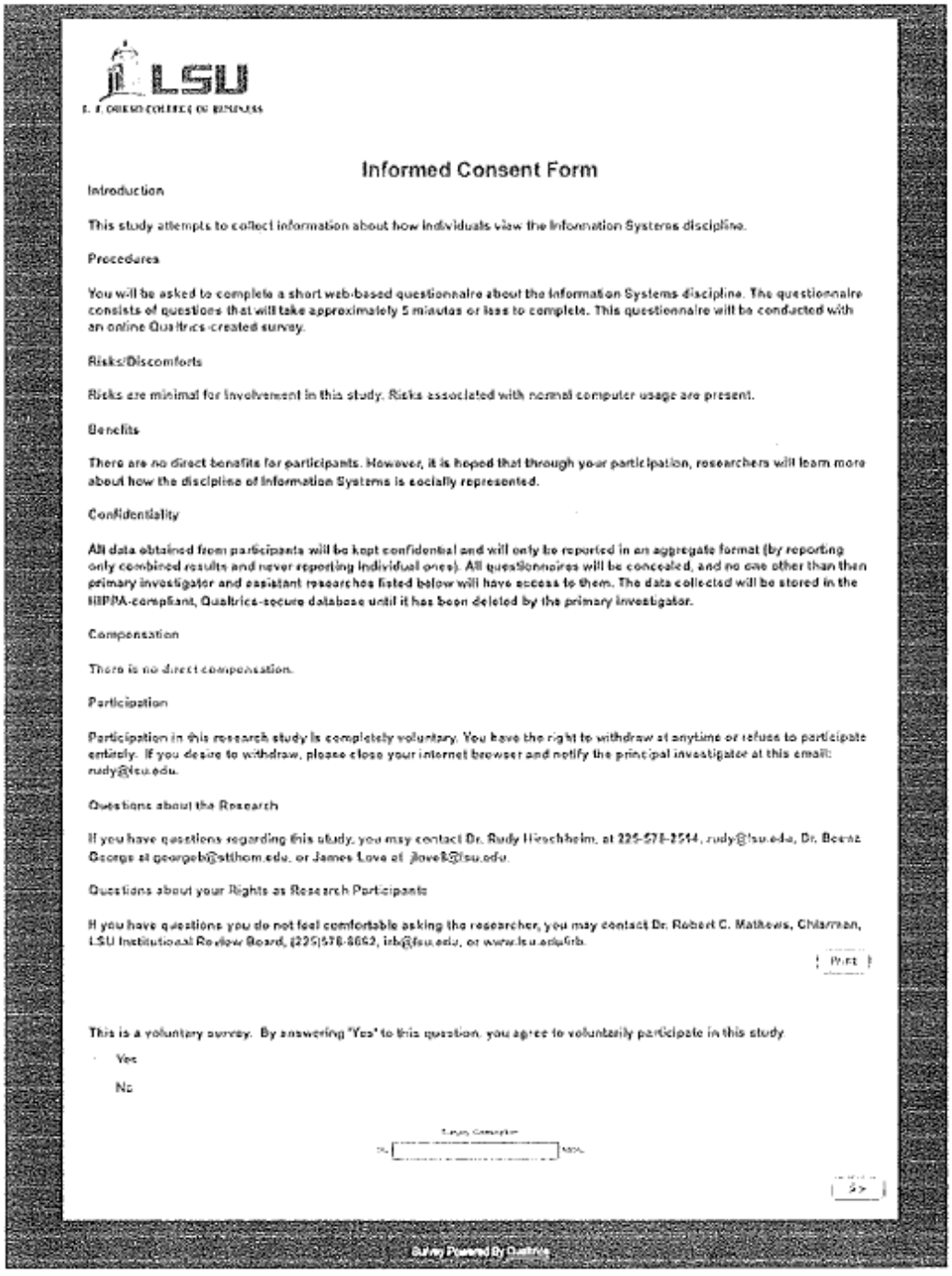
*Circle any **"vulnerable populations" to be used:** (children <18; the mentally impaired, pregnant women, the ages, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature [signature] **Date** Aug 9, 2012 (no per signatures)

** **I certify my responses are accurate and complete.** If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted: ✓ Not Exempted: Category/Paragraph: 2

Reviewer: Mathews Signature: [signature] Date: 8/24/12



LSU
E. J. GHEENO COLLEGE OF BUSINESS

Informed Consent Form

Introduction

This study attempts to collect information about how individuals view the Information Systems discipline.

Procedures

You will be asked to complete a short web-based questionnaire about the Information Systems discipline. The questionnaire consists of questions that will take approximately 5 minutes or less to complete. This questionnaire will be conducted with an online Qualtrics-created survey.

Risks/Discomforts

Risks are minimal for involvement in this study. Risks associated with normal computer usage are present.

Benefits

There are no direct benefits for participants. However, it is hoped that through your participation, researchers will learn more about how the discipline of Information Systems is socially represented.

Confidentiality

All data obtained from participants will be kept confidential and will only be reported in an aggregate format (by reporting only combined results and never reporting individual ones). All questionnaires will be concealed, and no one other than then primary investigator and assistant researches listed below will have access to them. The data collected will be stored in the HIPPA-compliant, Qualtrics-secure database until it has been deleted by the primary investigator.

Compensation

There is no direct compensation.

Participation

Participation in this research study is completely voluntary. You have the right to withdraw at anytime or refuse to participate entirely. If you desire to withdraw, please close your internet browser and notify the principal investigator at this email: rudy@lsu.edu.

Questions about the Research

If you have questions regarding this study, you may contact Dr. Rudy Hirschheim, at 225-578-2544, rudy@lsu.edu, Dr. Beena George at georgeb@stthom.edu, or James Love at jlove8@lsu.edu.

Questions about your Rights as Research Participants

If you have questions you do not feel comfortable asking the researcher, you may contact Dr. Robert C. Mathews, Chairman, LSU Institutional Review Board, (225)578-8692, irb@lsu.edu, or www.lsu.edu/irb.

Print

This is a voluntary survey. By answering "Yes" to this question, you agree to voluntarily participate in this study.

- Yes
- No

>>

Survey Powered By Qualtrics

If no, end survey.

Study Exempted By:
Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/irb
Exemption Expires: 8/23/2015

VITA

James Love is a Doctoral Candidate in the Department of Information Systems & Decision Sciences in the E. J. Ourso College of Business at Louisiana State University in Baton Rouge, LA. He previously earned a Bachelor of Business Administration degree in Business Information Systems and a Master of Science degree in Information Systems at Mississippi State University. Prior to entering the Ph.D. program at Louisiana State University, he worked in university IT departments at Mississippi State University and Wake Forest University.

His research interests aim to advance the understanding of interactions among people, processes, and technology. This often leads him to study behavioral research aspects such as participation, contribution, adoption, usage, sensemaking, and representations of information systems. He generally situates these research studies within the context of groups that serve broader societal goals such as academic communities, healthcare organizations, open source/crowdsourced communities, and other virtual communities.