MANAGEMENT INFORMATION SYSTEMS AND THE AGE OF SOCIAL MEDIA: AN INVESTIGATION OF SOCIAL NETWORK RESEARCH

THESIS

Carissa M. Parker, Senior Master Sergeant, USAF

AFIT-ENV-13-M-37

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

DISTRIBUTION STATEMENT A
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

AFIT-ENV-13-M-37

MANAGEMENT INFORMATION SYSTEMS AND THE AGE OF SOCIAL MEDIA: AN INVESTIGATION OF SOCIAL NETWORK RESEARCH

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Information Resource Management

Carissa M. Parker, BA

Senior Master Sergeant, USAF

March 2013

AFIT-ENV-13-M-37

MANAGEMENT INFORMATION SYSTEMS AND THE AGE OF SOCIAL MEDIA: AN INVESTIGATION OF SOCIAL NETWORK RESEARCH

Carissa M. Parker, BA

Senior Master Sergeant, USAF

Approved:

Alan R. Heminger, Ph.D. (Chairman)	Date
Brent Langhals, Lt Col, USAF (Member)	Date
Darin A. Ladd, Lt Col, USAF (Member)	Date

Abstract

Due to the up-rise of social media, social networking sites have increased in popularity and use over the last few years. During this time, research related to social networks has also escalated. This study presents social network research trends found in *ISR*, *JMIS*, and *MISQ* for a six year period, 2005-2010. The social network-related articles from these premier MIS journals were examined in terms of topical theme and research strategy employed. Furthermore, the most productive authors and affiliations were identified and presented individually, by state, and by region. An additional outcome of this research is the presentation of a preliminary classification system for research topics associated social networking, which may also be generalized to include a wide-array of information technology themes.

Table of Contents

Page

Page

List of Figures

Page

List of Tables

Page

MANAGEMENT INFORMATION SYSTEMS AND THE AGE OF SOCIAL MEDIA: AN INVESTIGATION OF SOCIAL NETWORK RESEARCH

I. Introduction

Background

Since the explosion and further technological advances of social media in the 21st century, information sharing and development has been at the forefront of how to best capitalize on this medium. From politics (Wattal et al., 2010) and e-commerce (Dellarocas et al., 2010) to business and knowledge sharing practices of organizations (Kane & Fichman, 2009), it is evident that social media plays a significant role in influencing individuals and, in turn, the way we do business today.

The management information systems (MIS) field is both young and unique and, as such, constantly experiences rapid change (Palvia et al., 2003). Therefore, it is useful to examine major research issues and their trends (Palvia and Pinjani, 2007) to consolidate what the field has explored and to determine the way ahead. Social networking has recently become one such issue due to the up-rise of social media technology and availability. To date, however, there has not been an examination as to what has been researched or considered in the way of social networks.

Research Question

This thesis is an exploratory study of recent trends in social network-related research published by three of the leading professional journals for management

information systems. The research is motivated by the desire to answer the following question: *Given the recent surge in the use and popularity of social media, what is the status of published research in this area?* In order to gain insight to answer the overarching research question, this thesis will focus on the following three core investigative questions:

- *What are the prominent themes of social network research?*
- *How are these themes being explored in terms of research methodologies?*
- *Are there specific authors and affiliations that seem to take the lead in social network research?*

Research Objectives

General reviews of past research efforts typically include: research topics and themes, research methodologies, and productive authors/affiliations (Palvia and Pinjani, 2007). This research effort will incorporate the aforementioned areas of analyses to pursue the following objectives related to social network research:

1. Identify topical themes of research within the context of social networks;
2. Identify research strategies used;
3. Identify the most productive authors and the universities/affiliations associated with the most research publications.

Methodology

Research articles were identified from *Management Information Systems Quarterly* (MISQ), *Information Systems Research* (ISR), and the *Journal of Management*

Information Systems (JMIS) published from 2005 to 2010. Using content analysis, bibliometric, and bibliographic techniques, data was collected for each article on the (1) topic, (2) research strategy, (3) contributing author(s), and (4) contributing author(s) affiliation. Trends were then identified across these elements and conclusions drawn as to the contributions of these journals to the MIS community in terms of social network research.

Thesis Overview

This thesis consists of five chapters. The present chapter, Chapter I, presented a general introduction and background to the research effort, the research questions to be investigated, the research objectives, and a brief description of the research methodology. Chapter II provides a review of the literature relevant to this research project. Chapter III describes the methodology used for conducting the research and details the frameworks, taxonomies, and approaches utilized. Chapter IV presents the results and analyses of the completed research. Chapter V brings the thesis to a close with a discussion of the findings, limitations, and recommendations for future research.

II. Literature Review

Chapter Overview

The main objective of this study is to identify social network research themes in the MIS field from 2005 through 2010. The literature review starts with the definition and classifications of social media which leads into the characteristics and a brief history of social networks. The following section of the chapter introduces the emergence and relevance of social network research exploration in the MIS discipline. The chapter then concludes with a review of recent, pertinent social network research studies conducted in the MIS field.

Social Media

Social media has been generally defined as the online platform and tools that people use to share information and media with others (Lai and Turban, 2008). More specifically, social media encompasses "the various activities that integrate technology, social interaction, and content creation" (U.S. General Services Administration, 2009). The forms that social media technologies take on are vast and include applications such as blogging, video/photo/music sharing, social networking, internet forums, social bookmarking, and wikis to name just a few. With so many applications and use of social media technologies, it has permeated our culture and has influenced the way we have historically communicated, collaborated, generated ideas, and made decisions.

Kaplan and Haenlein (2010) developed a classification scheme which groups the large number of social media applications into one of six categories (Table 1). These categories are determined by the amount of social presence/media richness and self-presentation/self-disclosure the specific technology allows.

Table 1. Social Media Classification

		Social Presence/Media Richness		
		Low	**Medium**	**High**
Self-Presentation/ Self-Disclosure	**High**	Blogs (e.g., Blogger, Live Journal)	Social Networking Sites (e.g., Facebook)	Virtual Social Worlds (e.g., Second Life)
	Low	Collaborative Projects (e.g., Wikipedia)	Content Communities (e.g., YouTube, Flickr)	Virtual Game World (e.g., World of Warcraft)

Of these six categories, social networking sites are not only the most popular, but have also seen the most growth in use over recent years (Zickuhr, 2010). As of August 2011, 65% of online adults use social networking sites – more than double the 29% who reported using social network sites in 2008 and thirteen times more than the 5% who reported using them in 2005 (Madden & Zickuhr, 2011). As of October 2012, Facebook, in-and-of-itself, reported more than one billion monthly active users on their site after being accessible to the public for little over six years (Facebook, 2012).

Social Networks

A social network is defined as individuals (or organizations) that are connected by a set of social relations, such as friendship, co-working, or information exchange (Garton

et al., 1997). The social network theory defines these social relationships in terms of nodes and ties, where nodes are the individual actors within the networks and ties are the relationships between the actors (Whelan, 2006).

Wellman (2001) defined computer-supported social networks as those which link people, institutions, and knowledge through computer-mediated communications. By this definition, a computer-supported social network could exist through groupware, decision support systems, bulletin boards, email, and chat rooms. Along the same lines, Agarwal et al. (2008) use the term "digitally enabled social networks" to describe social networks constructed on digital platforms. As with Wellman's definition, this term encompasses the wide number of social networks developed in the digital realm. For the purpose of this paper, the term "online social network" is used to describe those which specifically utilize and reside within a web-based service.

Online social networks began to emerge in the early/mid-1990s. The Globe, one of the first online social networks, launched in 1995 with the vision of promoting personal interactivity by turning "rudimentary chat rooms and homepages into a coherent network of ideas, articles, and personal logs" (Paternot, 2011). Registered users of this community were afforded the opportunity to engage in worldwide, real-time conversations through chat rooms and the ability to personalize their web presence through the use of avatars, self-chosen screen names, and home pages of their own design and making.

Boyd and Ellison (2007) define the newest generation of online social networks, termed "social network sites" (SNSs), as those that allow users to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with

whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. Using this definition, SNSs began appearing in the late 1990s with the most well-known SNSs launching in 2003 (MySpace) and 2004 (Facebook) (Boyd and Ellison, 2007). Both of these SNSs incorporated various social media technologies and quickly became popular among American teens with 55% of online teens ages 12-17 having a SNS profile in 2006 (Lenhart et al., 2007). By 2011, however, SNS usage had reached across all generations using the internet with the highest usage seen among individuals aged 18-29 at 87% and lowest seen in those aged 65+ at 29% (Zickuhr and Smith, 2012).

Social Networks and the MIS Discipline

Social networks are a rapidly growing research area for information systems scholars (Kukkonen et al, 2010). Prior to the SNS boom in 2005, *MISQ*, *ISR*, and *JMIS* published a combined total of 86 social network-related articles with the earliest appearance of the term "social network" occurring in 1986. However, from 2005 through 2010, the same three journals published a total of 128 social network-related articles. In comparison, social network publications in these journals increased over 40% in a third of the time as prior to 2005.

The Association for Information Systems (AIS) and AIS-affiliated conferences (i.e., ICIRM, ECIS, MCIA, PACIS, AMCIS, and ICIS) began incorporating topics specifically aimed toward social networking around 2008. Prior to this, an occasional presentation related to social networks was found in archived conference programs, however by 2008 tracks, mini-tracks, or sessions addressing various aspects of social

networking had become a consistent conference offering. The areas of interest such offerings were found under included: e-commerce, m-commerce, and collaboration (ICIRM); business value and Web 2.0 (ECIS); e-business, e-government, economics, human behavior, and emerging information systems (MCIS); virtual connections, knowledge management, business intelligence, and data mining (PACIS); security and privacy, human-computer interaction, sustainable internet models, virtual communities, and virtual technologies in the workplace (AMCIS); and human capital, research methods/philosophy, and digital collaborations (ICIS).

III. Methodology

Chapter Overview

This chapter outlines the process used to collect and examine articles for this research effort. Using qualitative and quantitative methodologies in the form of content analysis, bibliometric, and bibliographic techniques, data were collected for each article on the (1) topic, (2) research strategy, (3) contributing author(s), and (4) the contributing author's affiliation. The techniques and tools employed throughout this process are discussed in the *Measures/Instruments* section of this chapter.

Source of Research Articles

The Association for Information Systems (AIS) is stated to be the premiere professional association for individuals and organizations who lead the research, teaching, practice, and study of information systems worldwide. The senior scholars of this association have identified a "basket" of journals that the AIS deem as "excellent" (AIS, 2011a). The "AIS Senior Scholars' Basket of Journals" includes:

- *European Journal of Information Systems* (EJIS),
- *Information Systems Journal* (ISJ),
- *Information Systems Research* (ISR),
- *Journal of the Association for Information Systems* (JAIS),
- *Journal of Management Information Systems* (JMIS), and
- *Management Information Systems Quarterly* (MISQ).

The aforementioned journals were then compared to the top ten ranked MIS journals (AIS, 2011b). The MIS journal rankings are determined by the average rank points of nine independent reviews. Only three of those identified in the basket of journals were ranked among the top ten of MIS journals: *MISQ*, *ISR*, and *JMIS*. As a result, these three journals were selected for this study.

Identification of Research Articles

A full-text search of articles published by *MISQ*, *ISR*, and *JMIS* between January 2005 and December 2010 was conducted using the terms "social network," "social networks," and "social networking" through Business Source Premiere. This time period was selected as more popular online social networks began emerging in 2003. Given the time required to accomplish and publish research which may incorporate new social media, it was believed that 2005-2010 would capture the beginnings of said research.

A preliminary review of each article's abstract was accomplished to eliminate those that did not directly contribute a "systematic method with the purpose of eliciting new facts, concepts, or ideas" (Peritz, 1980) relating to social networks. The analysis excluded editorial notes, forewords, and commentaries. The remaining articles were then examined for the use of the search terms. It was discovered that often the search terms were used in the author's bio, the reference section, or were used as a single example unrelated to the overall purpose of the article. Of the potential 128 articles examined, 51 met the selection criteria.

Measures/Instruments

The proceeding sub-sections describe the methods used to organize and categorize the data extracted from each of the research articles

Subject/Topical Category.

The topical categories of the journal articles included in this study were classified and coded by analyzing the context in which the search terms were used and how those terms tied in to the overall contribution of the article. The context of use was then compared to the overall purpose or contribution of each article and a single descriptive word or phrase was assigned. In most cases, the descriptive word or phrase (or a variation of it) was also found among the author-supplied key words or within the abstract.

In 2003, *MISQ* stressed and focused on the importance of authors providing concise and high-quality abstracts and well-chosen keywords to ensure articles were indexed in electronic journal databases appropriately and to yield high retrieval precision (Weber, 2003). Additionally, the editorial staff of *ISR* requires authors to supply an abstract that succinctly communicates the contribution of their paper and keywords that describe the paper's theoretical and methodological orientation (ISR, 2011). Similarly, authors submitting manuscripts to *JMIS* must also include an abstract and keywords/phrases that illustrate the paper's content (JMIS, 2011).

With the assurance of precise author-supplied keywords and abstracts, these sections of the articles were examined to verify that the most relevant topical category was assigned to each.

Research Strategy.

The articles were classified into one of the five MIS research strategy categories proposed by Hamilton and Ives (1982) modified from Van Horn (1973). These categories are listed and defined in Table 2.

Table 2. MIS Research Strategies

STRATEGY	DEFINITION
Case Study	Narrative descriptions of organizations which focus on a broad detailed review which hopefully captures much of the complexity of the problem. Experimental design and/or controls are not employed (Van Horn, 1973). These studies most often include pre-existing data.
Field Study	Study of one or more organizations within an experimental design framework, but without experimental control. Large amounts of data are collected for use in attempts to isolate the effects of independent variables (Van Horn, 1973).
Field Test	Study of one or more organizations within an experimental design framework. The researcher attempts to control or change some aspect of the system being studied in order to explain the impact of selected independent variables on the response measure (Van Horn, 1973).
Laboratory Study	Four approaches fall into this category: simulation, small group, man-machine, and prototype experiments. Simulation and prototype experiments involve development of models of computer-organization and MIS's respectively, to study the impact of certain variables on the organization. Small group experiments are designed to explore human behavior problems in a man-machine system. Man-machine experiments explicitly focus on factors involving the interface between the system and the human decision maker to develop a more meaningful understanding of how persons interact with machine-based systems (Van Horn, 1973).
Non-empirical	Approaches which rely on secondary sources or the author's experience to support conclusions (Hamilton and Ives, 1982).

Authorship and Affiliation.

Three methods proposed by Chua et al. (2002) were adopted to rank contributing authors: normal count, adjusted count, and straight count. A fourth method (positional

count) was created to capture and create a weight value determined by the author's position among co-authors in the article. These four methods are listed and described in Table 3.

Table 3. Authorship and Affiliation Rank Methods

METHOD	CALCULATION
Normal Count	Every coauthor of an article receives one point. Each author's affiliation received a maximum score of 1 for each paper, even if there were multiple authors from the same school.
Adjusted Count	The weight of each article is 1 divided by the total number of authors. In the instance of assigning credit to affiliations, the weight of each article is 1 divided by the total number of unique affiliations.
Straight Count	Only the first author/affiliation is given credit for a work.
Positional Count	Weight value is determined by the position of the author in the article's author list. Authors listed first receive a score of 1, second receives 0.7, third receives 0.5, and forth receives 0.3. A solo author receives a score of 1.5.

IV. Analysis and Results

Chapter Overview

Three core objectives were presented in Chapter I to gain further insight to answer the overarching research question: *Given the recent surge in the use and popularity of social media, what is the status of published research in this area?* This chapter presents the results of the analysis on the topical themes, research strategies employed, and the most contributing authors and affiliations in the context of social network-related research.

Topical Themes

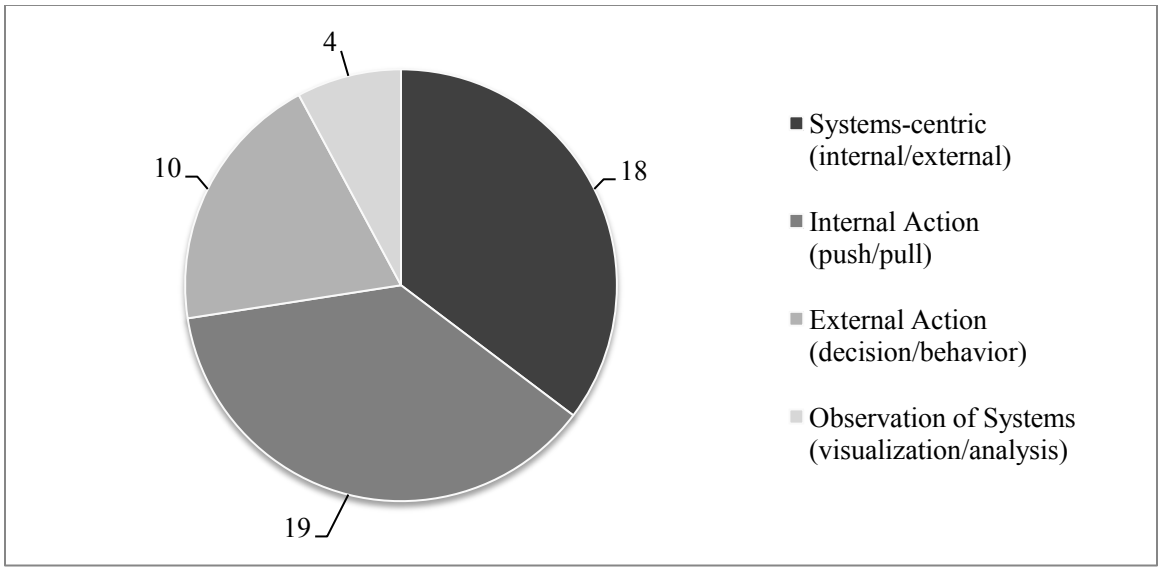
The first of the three objectives was to identify topical themes of research within the context of social networks. As stated in Chapter III, the topical theme was determined by the use and context of "social network" within each article. A total of 20 themes were identified and were further categorized by the environment and objective of use. The categories and descriptions are provided in Table 4.

Table 4. Topical Theme Categories

TOPICAL CATEGORY	DESCRIPTION
Systems-centric (internal/external)	Theme focused on user interaction with the system itself. Examples: IT acceptance/adoption and experiential computing.
Internal Action (push/pull)	Theme focused on user submitting to or retrieving from the system. Examples: information seeking and knowledge sharing.
External Action (decision/behavior)	Theme focused on user external action influenced by the system. Examples: competitive behavior and productivity.
Observation of Systems (visualization/analysis)	Theme focused on the visualization or analysis of the system or action. Examples: information visualization and network analysis.

Figure 1 depicts a representation of the total number of articles within each topical category.

Figure 1. Theme Category - Overall



The lead theme category, Internal Action, consisted of six unique topical themes: collaboration, contribution behavior, information mining, information seeking, information/knowledge sharing, and knowledge integration. Of these six themes, information/knowledge sharing and collaboration accounted for 63% of the category total with seven and five counts, respectively.

The second most popular category, Systems-centric, consisted of five unique topical themes: e-learning, experiential computing, protection of IT, intermediation, and IT acceptance/adoption. The only topic in this category to receive more than one count was IT acceptance/adoption which accounted for 78% of the category with 14 counts.

External Action was comprised of six unique topics: competitive behavior, influence on beliefs, influence on boundaries, productivity, strategic behavior, and trust. Competitive behavior and trust were the leading topics with fours and two counts, respectively.

The category with the least amount of counts was Observation of Systems. This category was comprised of only four topics: analysis of conversation streams, digital infrastructure analysis, visualization of information, and visualization of networks. None of these topics emerged as most popular due to each receiving only one count.

Figure 2. Theme Categories – Trends

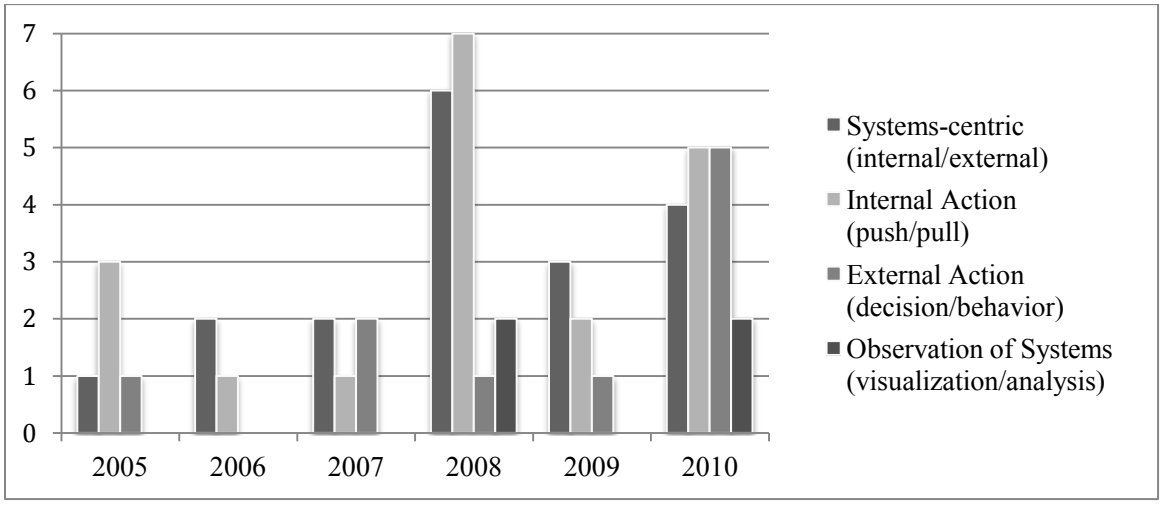


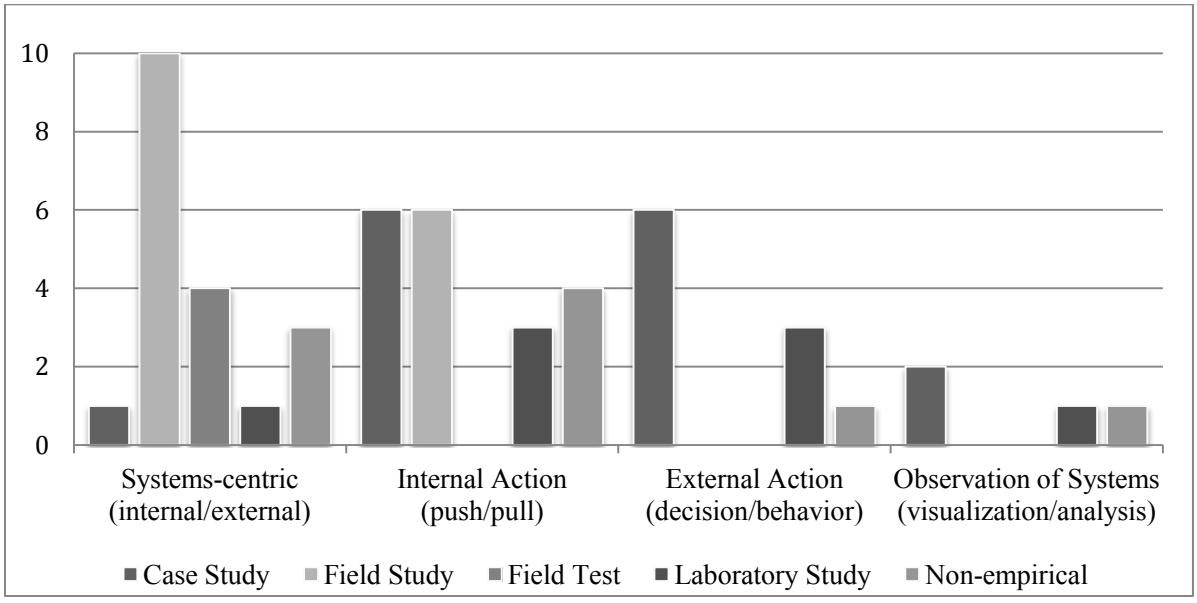
Figure 2 depicts the topical category trends from 2005 through 2010. As shown, Systems-centric and Internal Action topics were consistently present each year and were most prevalent in 2008 and 2010. ISR ran a special issue on the interplay between digital and social networks in September 2008 where four of the seven articles listed under the Internal Action category, one of the six under Systems-centric, and one of the two under

Observation of Systems derived from. This may account for the spike seen in these categories in 2008.

Research Strategies Employed

For the second research objective, articles were analyzed to identify the research strategies employed according to the categories described in Chapter III. Of the 51 articles examined, one contained two individual studies, each using a different strategy. In this case, both strategies (field study and laboratory study) were included in the analysis results. Overall, field studies made up for 31% of the articles included in this research project; case studies, 29%; non-empirical, 17%; laboratory studies, 15%; and field tests, 8%. Figure 3 presents a graphical representation of the research strategies used to explore each of the theme categories.

Figure 3. Research Strategy by Theme



The only theme that presented one or more instance of each strategy was Systems-centric. The most predominant strategy used to explore Systems-centric themes was field study (53%) and for External Action themes the lead strategy was case study (60%). The primary strategy used for Internal Action was divided between case study and field study which, together, accounted for 63% within the category.

Contributing Authors

The third objective of this study was to identify the authors and affiliations which seem to take the lead in social network research. There were 125 contributing authors identified, of which only eight were authors/co-authors of more than one article and five solo authors. Authors were scored using the system described in Chapter III. Due to the large number of co-authors with a single contribution, only solo authors and those with multiple contributions are presented below. Table 5 presents the top contributing authors by score.

Table 5. Top Contributing Authors

Author	Normal Count	Adjusted Count	Straight Count	Positional Count	Total
Levina, Natalia	2	1	2	2	7
Robert Jr., Lionel P.	2	0.66	2	2	6.66
Wattal, Sunil	2	0.58	2	2	6.58
Agarwal, Ritu	2	0.83	1	1.7	5.53
Wonseok Oh	2	0.66	1	1.7	5.36
Clemons, Eric K.	1	1	1	1.5	4.5

Melville, Nigel P.	1	1	1	1.5	4.5
Mitchell, Victoria L.	1	1	1	1.5	4.5
Trier, Matthias	1	1	1	1.5	4.5
Yoo,Youngjin	1	1	1	1.5	4.5
Vaast, Emmanuelle	2	1	0	1.4	4.4
Dennis, Alan R.	2	0.66	0	1.4	4.06
Mandviwalla, Munir	2	0.58	0	1	3.58

Contributing Affiliations

As a continuation of the previous section, author affiliations were also scored to determine the top contributors. A total of 80 unique affiliations were identified and the top 20%, as determined by total score, are provided in Table 6.

Table 6. Top Contributing Affiliations by Score

Author Affiliation	Normal Count	Adjusted Count	Straight Count	Positional Count	Total
New York University (Leonard N. Stern School of Business)	5	4.0	5	5.7	19.7
Temple University (Fox School of Business)	3	3.5	3	5.2	14.7
University of Maryland (Robert H. Smith School of Business)	4	3.8	2	4.4	14.2
McGill University (Desautels Faculty of Management)	4	4.3	1	4.3	13.6
University of Arkansas (Sam M. Walton College of Business)	3	1.6	3	3.7	11.3
University of Notre Dame (Mendoza College of Business)	1	3.0	1	2.2	7.2
Virginia Polytechnic Institute and State University (R. B. Pamplin College of Business)	1	3.0	1	2.2	7.2

Concordia University (John Molson School of Business)	2	0.8	2	2.0	6.8
Georgia State University (Robinson College of Business)	2	1.3	1	2.2	6.5
Emory University (Goizueta Business School)	2	1.0	1	1.7	5.7
Boston University (School of Management)	1	2.0	1	1.7	5.7
The Boeing Company	1	2.0	1	1.7	5.7
University of British Columbia (Sauder School of Business)	1	2.0	1	1.7	5.7
University of Cologne	1	2.0	1	1.7	5.7
Carnegie Mellon University (Tepper School of Business)	2	0.8	1	1.7	5.5
University College Cork	1	1.5	1	2.0	5.5

New York University scored highest in each method used and was determined to be the highest contributing institution with a total of five articles being published during the 2005-2010 time period. Both University of Maryland and McGill University contributed four articles each, but their placement in the line of co-authors impacted their overall score against Temple University which had authors in the first position in three articles, one which was a solo-authored article.

The Boeing Company was one of only two non-academic institutions among the 80 affiliations and, due to the number of total affiliations and authors within a single article, ended up in the top 20% of contributors.

Affiliation contribution by country was also calculated using the normal count method. The results, listed in descending order, are presented in Table 7.

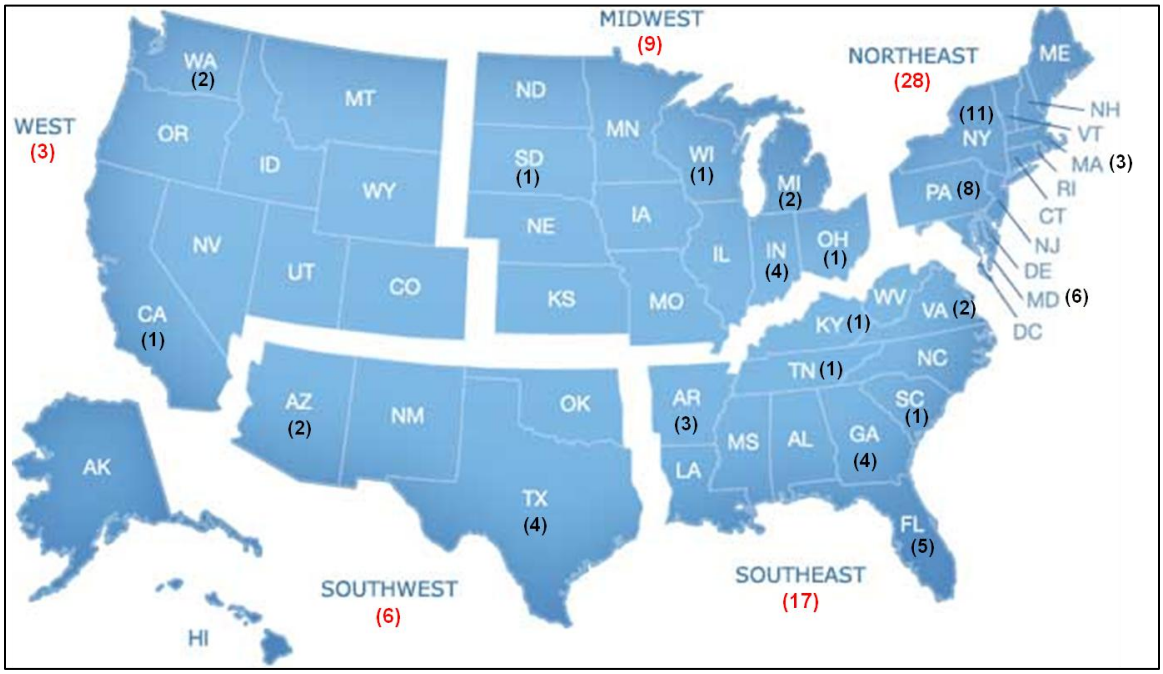
Table 7. Affiliation Contribution by Country

Country	Normal Count
United States	63
Canada	13
China	6
Germany	4
Australia	3
Ireland	3
Singapore	3

Country	Normal Count
Denmark	1
France	1
Iran	1
Puerto Rico	1
South Korea	1
Spain	1
United Kingdom	1

The United States accounted for 62% of all contributions, with Canada following at 13%. With the majority of contributions coming from the United States, affiliations were also identified by state and region. Figure 4 depicts the results, again using the normal count method.

Figure 4. U.S. Affiliation Contribution by State and Region



New York accounted for 17% of all the United States' contributions with a score of eleven. Pennsylvania was the second largest contributor with eight unique contributions followed by Maryland and Florida with six and five, respectively.

The Northeast was the lead region responsible for 44% of the United States' total contributions. The Southeast region followed with 27%; Midwest with 14%; Southwest with 10%; and lastly the West with 5%.

V. Discussion and Conclusions

Overview

This chapter revisits and discusses the three core investigative questions developed to answer the overarching research question of this study as outlined in Chapter I. Limitations of the study and recommendations for future research are also presented and the final section of this chapter provides concluding statements.

Research Questions and Findings

The first investigative question was, *"What are the prominent themes of social network research?"* In a systematic effort to identify the topical themes, the articles were examined for the use and connotation of the term "social network." The identified topic was then charted, resulting in twenty topical themes and four theme categories. The topical themes with the most occurrences were: IT acceptance/adoption, information/knowledge sharing, and collaboration. Out of the four topical theme categories, Internal Action had the most associated articles with the Systems-centric theme trailing by one. An interesting finding was that social network analysis was not a large contributor considering the search terms used to select the articles were variations of the term "social network." Ultimately, the Observation of Systems category which included the social network analysis topics contained only four articles.

The second investigative question sought to explore the strategies used to approach social network research. The articles were examined and the research strategy was categorized using the scheme proposed by Hamilton and Ives (1982). Researchers

appeared to favor field studies which accounted for 31% of the articles and case studies was the second most preferred at 29%. Not surprisingly, out of the final 51 articles, researchers incorporated field tests only four times.

The third investigative question was, *"Are there specific authors and affiliations that seem to take the lead in social network research?"* Authors' information was extracted and points were assigned according to their placement within the author list and the total number of authors of a given article. It was discovered that there was not a single author with more than two contributions during the studied time period, so the determining factor in identifying overall productivity was placement within the author list. The top three contributing authors were separated by only a fraction of a point with Natalia Levina receiving the highest score. Lionel P. Robert, Jr. and Sunil Wattal were second and third, respectively.

Affiliation productivity was determined using the same method as with the authors. New York University led with a total of five articles as well as five points in the overall score. University of Maryland and McGill University each contributed four unique articles, but it was Temple University which came in as the second highest contributor due to the submission of two single-authored papers.

Limitations

There are three primary limitations associated with this study. First, the articles were obtained from only three journals. Limiting this study to three journals possibly excluded a large body of research that may have contributed to the overall outcome. But the fact that the three journals used are all highly acclaimed, top-tier journals is also a

strength and should lend an amount of credibility to this study's results. Second, the term "social network" is relatively broad. As a result, articles explicitly addressing social network-related concepts and issues but did not use the term "social network" may not have been identified in this research. The third limitation is that each article was coded by a single coder, so any unintended biases held by the coder may have affected the findings.

Recommendations for Future Research

This research provided a starting point on identifying the status of published research in relation to MIS and social networks. Follow-on research should include expanding the study to additional journals within the MIS field to further validate this study. Future research might also include the expansion of the search terms to capture those articles which do not use the term "social network" but address social network-related concepts. Additionally, the use of other classification schemes for research strategies should also be considered. Several research strategies have evolved or emerged since the inception of the scheme used for this study, therefore, it may have been too limiting. It is also recommended that multiple coders are employed in future research efforts to decrease potential bias that may occur with only one coder. Lastly, future research should include the validation of the scheme developed for topical themes. The articles used for this study have been provided in the Appendix, affording the opportunity to validate the scheme by way of inter-rater reliability.

Conclusion

The MIS field is still young and continues to grow in breadth and depth. This study contributes to the breadth of the field by analyzing social network research trends in leading MIS journals from 2005 through 2010. The key outcomes of this study include: (1) a preliminary framework for classifying social network research by topical theme category; (2) insights into the emphasis of social network research areas within the field or in the journals themselves; and (3) an informative look at the productivity of authors and affiliations, particularly those which have emerged in the field of social network research.

Appendix. Research Articles Used for Study

Information Systems Research (ISR)

Agarwal, R., Animesh, A., & Prasad, K. (2009). Social interactions and the "digital divide": Explaining variations in internet use.

Bampo, M., Ewing, M.T., Mather, D.R., Stewart, D., & Wallace, M. (2008). The effects of the social structure of digital networks on viral marketing performance.

Chellappa, R.K. & Saraf, Nilesh. (2010). Alliances, rivalry, and firm performance in enterprise systems software markets: A social network approach.

Chi, L., Ravichandran, T. & Andrevski, G. (2010). Information technology, network structure, and competitive action.

Devaraj, S., Easley, R.F., & Crant, J.M. (2008). How does personality matter? Relating the five-factor model to technology acceptance and use.

Dhar, V. & Sundararajan, A. (2007). Information technologies in business: A blueprint for education and research.

Feller, J., Finnegan, P., Fitzgerald, B., & Hayes, J. (2008). From peer production to productization: A study of socially enabled business exchanges in open source service networks.

Gnyawali, D.R., Fan, W., & Penner, J. (2010). Competitive actions and dynamics in the digital age: An empirical investigation of social networking firms.

Gu, B., Konana, P., Rajagopalan, B., & Chen, H-W.M. (2007). Competition among virtual communities and user valuation: The case of investing-related communities.

Hahn, J., Moon, J.Y., & Zhang, C. (2008). Emergence of new project teams from open source software developer networks: Impact of prior collaboration ties.

Hinz, O. & Spann, M. (2008). The impact of information diffusion on bidding behavior in secret reserve price auctions.

Kane, G.C. & Alavi, M. (2008). Casting the net: A multimodal network perspective on user-system interactions.

Robert, Jr., L.P., Dennis, A.R., & Ahuja, M.K. (2008). Social capital and knowledge integration in digitally enabled teams.

Tilson, D., Lyytinen, K., & Sorensen, C. (2010). Digital infrastructures: The missing IS research agenda.

Trier, M. (2008). Towards dynamic visualization for understanding evolution of digital communication networks.

Zhu, B. & Watts, S.A. (2010). Visualization of network concepts: The impact of working memory capacity differences.

Journal of Management Information Systems (JMIS)

Bakos, Y. & Katsamakas, E. (2008). Design and ownership of two-sided networks: Implications for internet platforms.

Bardhan, I.R., Demirkan, H., Kannan, P.K., Kauffman, R.J. & Sougstad, R. (2010). An interdisciplinary perspective on IT services management and service science.

Bolton, G., Loebecke, C., & Ockenfels, A. (2008). Does competition promote trust and trustworthiness in online trading? An experimental study.

Brusque, S., Moyano, J., & Eisenberg, J. (2008). Individual adaptation to IT-induced change: The role of social networks.

Clemons, E. (2009). Business models for monetizing internet applications and web sites: Experience, theory, and predictions.

Feng, Y., Guo, Z., & Chiang, W-Y.K. (2009). Optimal digital content distribution strategy in the presence of the consumer-to-consumer channel.

Franceschi, K., Lee, R.M., Zanakis, S.H., & Hinds, D. (2009). Engaging group e-learning in virtual worlds.

Gallivan, M.J., Spitler, V.K., & Koufaris, M. (2005). Does information technology training really matter? A social information processing analysis of coworkers' influence on IT usage in the workplace.

Kwon, D., Oh, W., & Jeon, S. (2007). Broken ties: The impact of organizational restructuring on the stability of information-processing networks.

Lam, J.C.Y. & Lee, M.K.O. (2006). Digital inclusiveness—longitudinal study of internet adoption by older adults.

Mai, B., Menon, N.M., & Sarkar, S. (2010). No free lunch: Price premium for privacy seal-bearing vendors.

Montazemi, A.R., Siam, J.J., & Esfahanipour, A. (2008). Effect of network relations on the adoption of electronic trading systems.

Oh, W., Choi, J.N., & Kim, K. (2005). Coauthorship dynamics and knowledge capital: The patterns of cross-disciplinary collaboration in information systems research.

Poltrock, S. & Handel, M. (2010). Models of collaboration as the foundation for collaboration technologies.

Robert, Jr., L.P., Dennis, A., & Hung, Y-T.C. (2009). Individual swift trust and knowledge-based trust in face-to-face and virtual team members.

Singh, P.V. & Tan, Y. (2010). Developer heterogeneity and formation of communication networks in open source software projects.

Son, J-Y. & Benbasat, I. (2007). Organizational buyers' adoption and use of B2B electronic marketplaces: Efficiency- and legitimacy-oriented perspectives.

Wattal, S., Racherla, P., & Mandviwalla, M. (2010). Network externalities and technology use: A quantitative analysis of intraorganizational blogs.

Xu, Y., Kim, H.W., & Kankanhalli, A. (2010). Task and social information seeking: Whom do we prefer and whom do we approach?

Zimmer, J.C., Henry, R.M., & Butler, B.S. (2007). Determinants of the use of relational and nonrelational information sources.

Management Information Systems Quarterly (MISQ)

Abbasi, A. & Chen, H. (2008). Cybergate: A design framework and system for text analysis of computer-mediated communication.

Anderson, C.L. & Agarwal, R. (2010). Practicing safe computing: A multimethod empirical examination of home computer user security behavioral intentions.

Beaudry, A. & Pinsonneault, A. (2010). The other side of acceptance: Studying the direct and indirect effects of emotions on information technology use.

Bhattacherjee, A. & Sanford, C. (2006). Influence processes for information technology acceptance: An elaboration likelihood model.

Garud, R. & Kumaraswamy, A. (2005). Vicious and virtuous circles in the management of knowledge: The case of Infosys Technologies.

Hsieh, J.J.P-A., Rai, A., & Keil, M. (2008). Understanding digital inequality: Comparing continued use behavioral models of the socio-economically advantaged and disadvantaged.

Levina, N. & Vaast, E. (2005). The emergence of boundary spanning competence in practice: Implications for implementation and use of information systems.

Levina, N. & Vaast, E. (2008). Innovating or doing as told? Status differences and overlapping boundaries in offshore collaboration.

McLure-Wasko, M. & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice.

Melville, N.P. (2010). Information systems innovation for environmental sustainability.

Mitchell, V.L. (2006). Knowledge integration and information technology project performance.

Olivera, F., Goodman, P.S., & Swee-Lin Tan, S. (2008). Contribution behaviors in distributed environments.

Sykes, T.A., Venkatesh, V., & Gosain, S. (2009). Model of acceptance with peer support: A social network perspective to understand employees' system use.

Wattal, S., Schuff, D., Mandviwalla, M., & Williams, C.B. (2010). Web 2.0 and politics: The 2008 U.S. presidential election and an e-politics research agenda.

Yoo, Y. (2010). Computing in everyday life: A call for research on experiential computing.

Bibliography

Agarwal, R., Gupta, A. K., & Kraut, R. (2008). Editorial overview: The interplay between digital and social networks. *Information Systems Research*, *19*(3), 243-252.

AIS. (2011a). Senior scholars' basket of journals. http://start.aisnet.org/?SeniorScholarBasket. Accessed July 2011.

AIS. (2011b). MIS Journal Rankings. http://start.aisnet.org/?JournalRankings. Accessed July 2011.

Boyd, D. M. & Ellison, N. B. (2007). Social Network Sites: Definition, history and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210-230.

Chua, C., Cao, L., Cousins, K., & Straub, D. W. (2002). Measuring researcher-production in information systems. *Journal of the Association for Information Systems*, *3*(2002), 145-215.

Dellarocas, C., Gao, G., & Narayan, R. (2010). Are consumers more likely to contribute online reviews for hit or niche products?. *Journal of Management Information Systems*, *27*(2), 127-158.

Facebook. (2012). Facebook Key Facts. http://newsroom.fb.com/Key-Facts. Accessed October 2012.

Garton, L., Haythornthwaite, C., & Wellman, B. (1997). Studying online social networks. *Journal of Computer-Mediated Communication, 3*(1).

Hamilton, S. & Ives, B. (1982). MIS research strategies. *Information & Management*, *5*(6), 339-347.

ISR. (2011) Instructions for Authors. http://www.informs.org/content/view/full/10308. Accessed September 2011.

JMIS. (2011) Information for Contributors. http://www.jmis-web.org/info-co. Accessed September 2011.

Kane, G. C. & Fichman, R. G. (2009). The shoemaker's children: using wikis for information systems teaching, research, and publication. *MIS quarterly*, *33*(1), 1-17.

Kaplan, A. M. & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, *53*(1), 59-68.

Lai, L. S. & Turban, E. (2008). Groups formation and operations in the Web 2.0 environment and social networks. *Group Decision and Negotiation*, *17*(5), 387-402.

Lenhart, A., Madden, M., Macgill, A., & Smith, A. (2007). Teens and social media. *Pew Internet & American Life Project*.

Madden, M. & Zickuhr, K. (2011). 65% of online adults use social networking sites. *Pew Internet & American Life Project*.

Oinas-Kukkonen, H., Lyytinen, K., & Yoo, Y. (2010). Social networks and information systems: Ongoing and future research streams. *Journal of the Association for Information Systems*, *11*(2), 61-68.

Palvia, P., Mao, E., Salam, A. F., & Soliman, K. S. (2003). Management information systems research: What's there in a methodology?. *Communications of the Association for Information Systems*, *11*, 289-309.

Palvia, P., Pinjani, P., & Sibley, E. H. (2007). A profile of information systems research published in *Information & Management*. *Information & Management*, *44*(1), 1-11.

Paternot, S. (2011). "Here's why every social network must change or die." *Business Insider.* Article n.pag. http://read.bi/oCSehD. Accessed May 2012.

Peritz, B. C. (1980). The methods of library science research: Some results from a bibliometric survey. *Library Research*, *2*(3), 251-268.

General Services Administration. (2009). GSA social media policy. http://www.gsa.gov/graphics/staffoffices/socialmediapolicy.pdf. Accessed April 2011.

Van Horn, R. L. (1973). Empirical studies of management information systems. *Data Base*, *5*(2-3-4), 172-182.

Wattal, S., Schuff, D., Mandviwalla, M., & Williams, C. B. (2010). Web 2.0 and politics: the 2008 US presidential election and an e-politics research agenda. *MIS Quarterly*, *34*(4), 669-688.

Weber, R. (2003). Editor's comments: The problem of the problem. *MIS Quarterly*, *27*(1), iii-ix.

Wellman, B. (2001). Computer networks as social networks. *Science*, *293*, 2031-2034.

Whelan, E. (2006). Exploring knowledge exchange in electronic networks of practice. *Journal of Information Technology*, *22*(1), 5-12.

Zickuhr, K. (2010). Generations 2010. *Pew Internet & American Life Project*.

Zickuhr, K. & Smith, A. (2012). Digital differences. *Pew Internet & American Life Project*.

REPORT DOCUMENTATION PAGE		Form Approved OMB No. 0704–0188
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704–0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202–4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.		
1. REPORT DATE (DD–MM–YYYY) 21 March 2013	2. REPORT TYPE Master's Thesis	3. DATES COVERED *(From — To)* May 2009 – Mar 2013
4. TITLE AND SUBTITLE Management Information Systems and the Age of Social Media: An Investigation of Social Network Research		5a. CONTRACT NUMBER 5b. GRANT NUMBER 5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S) Parker, Carissa M. Senior Master Sergeant (SMSgt) U.S. Air Force		5d. PROJECT NUMBER 5e. TASK NUMBER 5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/ENV) 2950 Hobson Way WPAFB OH 45433-7765		8. PERFORMING ORGANIZATION REPORT NUMBER AFIT-ENV-13-M-37
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) INTENTIONALLLY LEFT BLANK		10. SPONSOR/MONITOR'S ACRONYM(S) 11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION / AVAILABILITY STATEMENT DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED		
13. SUPPLEMENTARY NOTES This material is declared a work of the U.S. Government and is not subject to copyright protection in the United States.		

14. ABSTRACT

Due to the up-rise of social media, social networking sites have increased in popularity and use over the last few years. During this time, research related to social networks has also escalated. This study presents social network research trends found in *ISR*, *JMIS*, and *MISQ* for a six year period, 2005-2010. The social network-related articles from these premier MIS journals were examined in terms of topical theme and research strategy employed. Furthermore, the most productive authors and affiliations were identified and presented individually, by state, and by region. An additional outcome of this research is the presentation of a preliminary classification system for research topics associated social networking, which may also be generalized to include a wide-array of information technology themes.

15. SUBJECT TERMS social network, social media, management information systems research, MIS journals, research productivity, research strategies, topical themes, social network research					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON Dr. Alan R. Heminger, ENV
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U	UU	43	19b. TELEPHONE NUMBER (Include Area Code) (937)255-3636, x 7405 alan.heminger@afit.edu