International Federation for Information Processing
Working Group 8.2
Information Systems and Organizations
ifip

Organizations and Society in Information Systems
(OASIS) 2007 Workshop

Montréal, Québec, Canada
9 December 2007

Program and Abstracts

Program Overview

Salon B

Welcome: 8:45 a.m.

Session 1: Users and Uses of Information Technologies

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Older Adults and Information Technology: The Current State of Research and Future Directions for Information Systems Researchers
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Social Obligation versus Social Responsibility: What Factors Influence Organizations to Provide Web Accessibility? *Lih-Bin Oh, Yao Zhang*

Correspondent Banking in Brazil: Technology to Improve Microcredit
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An End-User Perspective on User-Centered Innovation *Birgitta Bergvall-Kåreborn, Anna Ståhlbröst, Marita Holst*

Electronic Social Networks and Health
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Electronic Health Records and the Changing Social Identity of Health Care Professionals *Olga Volkoff, Diane M. Strong, Sharon A. Johnson*

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Session 2: E-Services and E-Government

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Analyzing and Designing e-Service Systems: Integrating Service Responsibility Table and Unified Modeling Language
Xin Tan, Steven Alter, Keng Siau

An Aspectual Analysis of E-Government
Subrahmaniam Krishnan-Harihara, Andrew Basden

Privacy and Security in E-Government from the Perspective of the Government Worker
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Yukika Awazu

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A Framework for Informed Off-shoring Decisions
David Wilson

International Issues in Information Technology Outsourcing: A Categorical Analysis
Bouchaib Bahli, Kevin Carillo

Ethical IT Outsourcing – Do Social Costs Matter?
Ron Babin

The Outsourcing I-space: Knowledge Management across Global Boundaries
Saima Khan

Closing the Market: A Side-Effect of an Efficient E-Marketplace
Lapo Mola, Andrea Carugati, Cecilia Rossignoli

The Role of Boundary Objects in Collaborative Conflict
Uri Gal, Mike Chiasson

Session 8: Theory and Language-Based Perspectives

2:40 p.m. - 4:15 p.m.

'Representation' in System Development
Alain Ross, Mike Chiasson, Barb L. Marcolin

The Reflective Design Environment
Matt Germonprez, Dirk S. Hovorka, Mike Chiasson

The Notion of 'Emergence' as a Linguistic Construct for Eliciting Security Requirements in ISD *Michelle Carter, Cherie Long, Duane Truex*

A Multi-Paradigmatic Approach
Dale Mackrell

Understanding the Interpretive Flexibility of Communication Systems
Kai Riemer, Stefan Klein

Information Systems, Machine Agency and Social Structure *Michael Cuellar*

Theorizing the Multiple Roles of an IT Artifact in a Distributed, Mediated Problem Solving Practice: An Ecological Approach
Brian Healy, Youngjin Yoo

4:30 p.m. IFIP 8.2 Business Meeting

International Federation for Information Processing (IFIP) Working Group 8.2

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General Chair
Catherine Middleton, Ryerson University

Administrative support provided by Terrence Ho, Ryerson University

Session 7: Outsourcing

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7.2   International Issues in Information Technology Outsourcing: A Categorical Analysis > *Bouchaib Bahli, Kevin Carillo*

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7.4   The Outsourcing I-space: Knowledge Management across Global Boundaries > *Saima Khan*

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7.6   The Role of Boundary Objects in Collaborative Conflict > *Uri Gal, Mike Chiasson*

Session 8: Theory and Language-Based Perspectives

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Johanna L. H. Birkland, Syracuse University, USA, jlbirkla@syr.edu
Michelle L. Kaarst-Brown, Syracuse University, USA, mlbrow03@syr.edu

In the US alone, it has been predicted that the senior population will grow to represent over 21% of the total population within the next fifty years, a 147% increase in the number of seniors from 2000 (U.S. Census Bureau, 2005). With the aging of the population and the seriousness of issues that face older adults, it will be important to discover ways in which information technology can be used to benefit older adults' lives and society as a whole. Research concerning older adults and information technology is dispersed across several disciplines and a variety of perspectives, with the majority of information systems literature focusing on only a few of the issues that older adults and society in general will face in the upcoming decades.

Based upon a review of the literature, we have conceptualized the issues that have been explored in this area into four major domains of current research: the social concerns, the financial concerns, physical/ cognitive concerns, and organizational concerns facing older users and the use of information technology. Examples of social concerns regarding usage of technology have discussed issues such as the digital divide and the use of computers to lessen social isolation. Financial concerns have included studies on technology adoption and marketing to older individuals. Organizational concerns have included studies regarding the growing percentage of older adults in the population and the impacts that this will have upon organizational knowledge retention and technology retraining. Physical and cognitive concerns have examined issues such as disability and assistive technology. Based upon a review of the literature, the authors suggest that the social and physical and cognitive issues remain the most addressed domains.

As can be seen in the diagram below, social and financial concerns have typically been addressed from a collective perspective, which has typically portrayed these issues as systematically impacting the entire older adult population and also having broad repercussions that affect society as a whole. Organizational and physical/ cognitive concerns have been addressed from an individualistic standpoint and have typically been portrayed as impacting our society from the individual level. This relationship is portrayed in the vertical axis of the figure. The horizontal axis visualizes the issue domains as whether they have been addressed as more economic issues (involving potential loss of revenue for organizations or concerns over revenue retention as the population ages) or as purely humanistic issues (involving societal impacts due to decreased older adult participation).

Information systems research in this area has mainly focused on exploring issues in the cognitive and physical issues domain, with most research concentrating on usability issues surrounding information technology use by the elderly. The authors suggest several directions for future information systems research, including diversifying the methods used to study each domain of issues and exploring the impact of emerging forms of technology.

Figure 1. Domains of issues addressed in the literature regarding older adults and information technology
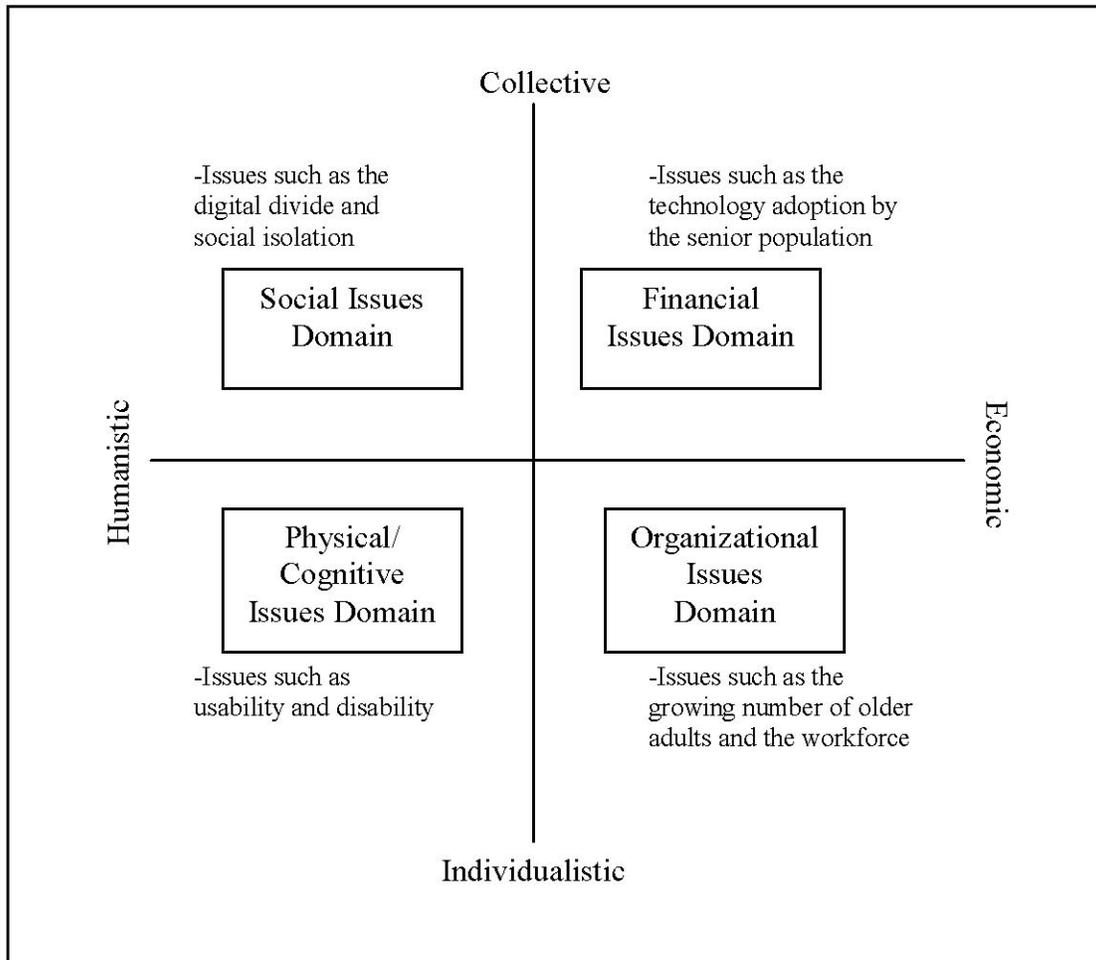
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1.2 Social Obligation Versus Social Responsibility: What Factors Influence Organizations to Provide Web Accessibility?

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Yao Zhang, Xiamen University, China, zhangyao@sent.com

The importance of all citizens having equal rights to access to electronic information is widely recognized. However, as Websites attempt to become more visually appealing by incorporating rich media like graphics, audio, video and animation, it has resulted in most parts of the Web becoming incomprehensible and inaccessible to the group of people with disabilities. To address this, the concept of Web accessibility has been advocated by researchers, organizations, as well as the legislators since the mid-1990s (Yu 2002). Web accessibility refers to the ability of people with disabilities to perceive, understand, navigate, interact with the Web and also contribute information to the Web (Henry 2006). It is widely believed to be an effective means of bridging the digital barriers in which users with disabilities are denied equal opportunity to benefit from online information and services.

Extant research on Web accessibility has mainly focused on the technical aspects of Website accessibility. There are numerous guidelines to guide practitioners in terms of Web content, user agent and authoring tool development. There are also works related to the attainment of accessible Websites using automated tools (e.g., Richards and Hanson 2004) and proposals of alternative approaches to provide Web accessibility (Kelly et al. 2007; Sloan et al. 2006). Many empirical studies that have examined the accessibility of government, university, and corporate Websites have reported disappointing results (e.g., Jackson-Sanborn et al. 2002; Kane 2007; Loiacono and McCoy 2004; Williams et al. 2004). It was also found that the accessibility of some Websites is declining over time (Hackett et al. 2005). Lazar et al. (2004) investigated the perceptions of Webmasters and found that the key inhibiting factors to better corporate Web accessibility include the difficulty in convincing management of the importance of Web accessibility and lack of financial resources. However, there is a dearth of research examining the provision of Web accessibility as a form of corporate social responsibility from the perspectives of top corporate executives.

The literature on corporate social performance suggests that social obligation and social responsibility are two avenues in which organizations can manifest responsible corporate behavior (Sethi 1975; Wood 1991). In the philosophical sense, this corresponds to negative duty in the form of legal compliance (what ought not to be done) and positive duty in the form of doing social good (what ought to be done) (Singer 1965). Consumer rights' advocacy organizations have called for society's attention to Website accessibility and have even taken legal actions against those companies that failed to make their Websites e-accessible. Some of these lawsuits include those against Target (Meyers 2006), AOL, Bank of America, and Southwest Airlines (Haggman 2002). Globally, some governments have already taken or have been considering enforcing anti-discrimination laws and policies to mandate that Websites be made accessible (e.g. Section 508 of the Rehabilitation Act Amendments of 1998 in the U.S.; The Special Educational Needs and Disability Act of 2001 in the U.K.). While providing Web Accessibility due to legal compliance is prescriptive in nature, some organizations might be motivated by the public relations opportunity to project a positive image of being a responsible corporate citizen. This is because building accessible Websites helps to generate positive social impacts and improve corporate reputation.

Besides the disabled people, we believe that the fast growing aging population with impaired vision and hearing problems should also not be alienated. Providing Web accessibility certainly has the potential to result in much broader tangible and intangible returns in many aspects. In this research, we will explore the factors that influence organizations' intention to provide Web accessibility along the two dimensions of social obligation and social responsibility. First, interviews with senior executives will be conducted to identify their perceptions toward Web accessibility and the factors that affect their decision to provide accessibility on their Websites. Next, a large scale survey will be delivered to organizations to further advance our knowledge about this topic.

We expect that the results from our study would provide a better understanding of the factors that influence organizations in providing a higher level of accessibility on their Websites. Findings on the differential impacts of social obligation versus social responsibility factors would suggest appropriate measures to either strengthen regulatory requirements or to instill ethical corporate awareness in order to make Web Accessibility more pervasive. Results will offer numerous practical implications for multiple stakeholders in promoting more ubiquitous Web accessibility.

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1.3 Correspondent Banking in Brazil: Technology to Improve Microcredit

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Martin Jayo

This research proposes a deep investigation on the way information and communication technologies (ICT) can support correspondent banking (CB) models to improve microcredit delivery in Brazil. Traditionally provided by microfinance institutions (MFIs), microcredit is seen as a powerful approach to fight poverty in developing countries and it is facing new challenges in its path of development. If in the past decade, MFIs' challenge was associated with the creation of methodologies that could provide ways of lending small loans to micro entrepreneurs without collateral, now the challenge is more structural and related to ways to scale and diversify financial services offered to the low-income population. In addition, although microfinance has been successful in several parts of the world, in other parts it is increasing in a very slow pace, as is the case of Brazil. We believe that the current microcredit delivery models could be improved with a more purposive use of ICT combined with intensive knowledge of particular socio-cultural conditions.

A parallel phenomenon related to the microfinance industry, witnessed more specifically in the Brazilian banking industry, is associated with the burgeoning growth of correspondent banking (CB) as a means through which banks downscale financial services out of traditional bank branches. We define CB as a network where the intensive application of ICT provides banking services in retail stores, such as supermarkets, drugstores, lottery shops, post offices, and a number of other types of retail stores and service stations. This form of off-branch banking, enabled by the intensive application of ICT in the Brazilian banking industry describes the provision of banking services in partner businesses, whether for profit firms such as supermarkets and lottery shops, government point of services, as post offices, and also dedicated microfinance institutions (MFIs). Following the implementation of the CB model, the number of Brazilian municipalities without any type of banking service has dropped from 1,600 to nil in only three years (Alves and Soares 2006). Thanks to this degree of coverage, CB has turned out to be an indisputable provider of financial services to all, including poor neighborhoods on the outskirts of large cities, poor areas, and even urban shantytowns, whose populations have gained local access to banking services through correspondent banking. Efforts to replicate the Brazilian CB model are underway in a number of countries, as Mexico, Bolivia, India and others (Kumar et al 2006).

Although both traditional MFIs and CBs represent initiatives to extend financial services specifically to the lower-income population, a curious aspect is that they have developed independently, and do not have a clear association between them. It is quite common for banks to have in their organizational structure fully independent areas handling CB operations and microcredit without strategic cooperation between them. Banks have employed their CB networks almost exclusively for collection purposes (payment of utilities and other bills), ignoring their potential as a microcredit channel, due to their coverage and access to low-income customers. The overarching question for this proposed research is: "How to adapt the current ICT-based model of correspondent banking (CB), being successfully used in Brazil, to scale microcredit delivery in Brazil and in other countries?"

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1.4 An End-User Perspective On User-Centered Innovation

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Innovation is one of the big buzzwords today, both within industry and academia, since it is seen as a prerequisite for organizations' continuous survival and growth. Using the worlds of Per Eriksson, Director General at VINNOVA: "Research is making knowledge out of money – innovation is making money out of research."

One business sector where the demand for innovation is very high and the production, product, and service life cycle is exceptionally short is IT, and especially mobile computing. To complicate things even more, the traditional use contexts and user groups within this area are expanding while traditional boundaries, such as work and leisure, are becoming blurred. This expansion, together with a problem oriented and technology driven focus among traditional development approaches, has resulted in a knowledge-gap where research groups seem to lack a solid understanding of how to handle these new conditions.

There are, however, two trends in Sweden and Europe that address these difficulties. The first is a somewhat modified interest in user involvement and participation in the development process, often referred to as user-centric, or user-driven, development or innovation. This trend differs from more traditional participatory design (PD) theory in that it aims to involve end-users as innovators as well as context experts. The second, and somewhat related, trend is the creation and development of so called "Living Labs"; human-centric environments supportive of open innovation processes where users and user groups are involved in the development and testing of new technologies in their own real-life environment.

Though these two trends are emerging strongly they are in many respects more like a sketch than a finished drawing. They give directions for how we need to think and act on a methodological level but need to be supplemented with methods, tools and models. The trends are also presented from a business and societal perspective, rather than from an end-user perspective. Hence, there is a need to develop methods that support user-driven and user-centred development of innovative IT-based services that also focus on what might motivate people to participate in such activities. In our presentation we will present a methodology, called FormIT, that aims at facilitating the development of IT innovations in diverse and continuously changing real-life contexts; accepts the heterogeneous nature of users; and grounds the development process on user's dreams, visions and needs. We will also illustrate how this methodology has been used to develop an innovation community by a leading company within the telecommunication sector by adopting an end-user perspective. Finally, we will discuss the difference between a user-driven approach to innovation and development and a user-centric approach.

1.5 Electronic Social Networks and Health

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Our research explores the relationship between electronic social networks and employee health. Previous organizational studies have shown a strong correlation between healthy employees and productivity. In particular, healthy employees take fewer sick days and have a more positive attitude toward their work. Unrelated health sciences research has shown that people with strong social networks thrive in most areas of their lives and are less likely to develop cardiovascular disease, depression, or dementia.

We propose to extend this health sciences work to include electronic social networks in organizational settings. That is, we want to determine whether electronic social networks work as well as physical social networks in health promotion and disease prevention. If we can show that employees will maintain a positive level of wellbeing through electronic means, then employers will be less likely to object to the use of e-mail, instant messaging and similar technologies in the workplace. This work may also contradict the idea that people who work on computers are isolated and social outcasts.

We plan to begin our research by interviewing and monitoring a small sample of virtual and invalid workers to reduce the confounding influence of physical social networks. We can count the number of e-mails sent by this group, the number of telephone conversations, the number of close friends and family that are in contact electronically in a month, and so on. Health data, however, may be difficult to gather other than to ask participants to self-report. Many of the existing health studies noted above used long-term medical reports when available and otherwise accepted self-reporting.

Two limiting factors for our results are electronic organizational networks and the need to control for physical social networks. Electronic organizational networks include all of the e-mails and technical interaction that is part of many businesses. Existing social network research does not include these interactions, focusing only on communication with family and close personal friends. Since some friends may be business colleagues, we are not sure how to allow for this contact. The second issue noted above, control for physical social networks, means that we cannot conclude that electronic social networks provide health benefits unless we know that these benefits did not come from existing physical social networks. To deal with this issue, we have considered interviews with virtual workers who will not have live business contacts and interviews with invalids who have physical or mental limitations that will not allow them to get out. Both of these groups, however, may have strong physical social networks made up of people who contact them or who go to visit them.

We expect to conclude that electronic social networks provide the same health benefits as physical social networks. If this is true, then employers who currently allow or encourage e-mail and instant messaging for work-related interactions may want to allow it for {limited} social exchanges too. Because of the limitations noted above and the narrow scope of this first study, the results are generalizable only to similar organizational settings.

1.6 Electronic Health Records and the Changing Social Identity of Health Care Professionals

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Sharon A. Johnson, Worcester Polytechnic Institute, sharon@wpi.edu

After lagging most sectors in its use of IT, health care has recently seen a great upsurge in implementations of technologies such as electronic health records (EHRs). Realizing the full benefits of such investments requires, however, a clear understanding of the organizational changes that accompany such implementations. Our research takes a critical realist perspective and employs grounded theory methodology first to identify the aspects of organizations that are most highly affected by an EHR implementation, and then to build a model of the mechanisms through which those effects arise.

The use of critical realism enables us to retain a sense of the technology as a material object while we explore how the technology and the people who use it redefine each other through their ongoing interactions (Volkoff et al., 2007). In particular it supports identifying specific aspects of the IT artifact (rather than treating it as a unitary whole) and relating those aspects to specific elements of the organization and, in this case, the social identities of the different users.

The study consists of two longitudinal case studies. The first case examines the implementation of an EHR at Fallon Clinic in central Massachusetts. Fallon has approximately 250 physicians and 1500 other employees spread across nearly 30 locations. They provide a combination of primary, acute and specialty care. The second case examines an EHR implementation at Vancouver Coastal Health, one of six regional health authorities in BC. Its nearly 22,000 staff members operate in over 500 locations, including 13 acute care facilities. The selection of these two sites offers contrasts across a variety of parameters including governance and institutional environment, size, and organizational structure. While both are implementing EHRs, the software comes from two different vendors.

At both sites data will be collected through interviews conducted at three points during the implementation: just prior to roll-out, shortly after go-live, and finally when use has stabilized. At this point 50 first phase interviews have been completed at the US site with a variety of health care practitioners (including physicians, practice managers, nurses, and medical assistants), and second phase interviews are underway. At the Canadian site only four interviews have been completed, with more scheduled in the next few weeks.

Early findings include the effects of EHR use on the social identity of users. For example the physicians feel that the physical task of data entry turns them into typists, diminishing their stature as defined by their professional skills. At the same time the nurses feel that standardization of data records, which supported an institutional move to patient load sharing, diminishes their role as caregivers. Due to such observations, we are now focusing on identifying more clearly the parameters that each group of health care professionals has used to define itself and differentiate itself from other groups, and to follow how those parameters are affected over time by EHR use. We are also examining how the standardization of data formats affects processes such as knowledge creation regarding patient health status.

2.1 A Collective Action Model of E-Government Transformation: Insights from a Study of Singapore's I-Government

Paul Devadoss, Lancaster University, UK, p.devadoss@lancaster.ac.uk

Singapore is a leader in E-government initiatives (Devadoss et al 2003). In a recent e-government survey by Accenture, Singapore was ranked first among several countries actively developing e-government initiatives. Singapore is no new convert to adopting information technologies (IT). Its efforts in adopting technological developments and willingness to reengineer its processes for efficiency are key factors that have guided its policies since the early 1980's (Mechling, 1994; Gurbaxani et al, 1990). Further, Singapore has progressed from adopting IT, to providing electronic access to all government services. More recently, it has moved to 'integrating government'. This gradual transition is aided by Singapore's continuous support towards utilizing IT to benefit an efficient organization of government services.

However, these services were not always guided by a central policy in diffusing IT throughout the government. Several choices in a distributed institutional setup were supported by early policies in technology adoption. Some departments promoted internal adoption of some technologies suited for their purposes. Eventually, a government wide program developing e-government adoption was promoted, along with suitable institutional frameworks. In this process, some choices were promoted over others. Smaller groups of organizations provided integrated services, and promoted their choice of platforms and service delivery to the whole e-government process.

Given this context of e-governments, stage models have attempted to model transformation (e.g. Layne and Lee, 2001). However, stage models do not adequately capture the various change processes, and social action involved in such transformation. Given the collection of institutions, and the transformation of government, institutional change theories can contribute by focusing on the various actors and their role in the change processes.

The choice of theories in this context appears to be Institutional diffusion, or Collective action (Hargrave and Van de Ven, 2006). In the absence of a directed change, and the difficulty in directing such change across several institutions, we frame the transformation in e-governments as a collective action model. In the case of e-governments, their decision-making is driven by more than central recognition of organizational benefits. There is an agenda beyond immediate intra-organizational goals, which involves the evolution of technologies, and its relevance to huge investments made by governments. Further, governments try to use their investments to achieve economic benefits, as well. An obvious choice is to consider a model of change that can account for organizational interests in shaping the transformation, and the various processes and structures that are mobilized to inform and influence such transformation. Further, social processes that influence the choice of technologies, and their shape in use by institutions in the macro socio-economic context need to be examined as well.

Hence, in this research, we propose a collective action model of e-government transformation. Various actors with conflicting views of technology and services in the government achieve transformation through their behavior. A case study of this change process involving several bureaucratic institutions should reveal rich insights into the dynamics that lead to mature e-governments, while not tying them into a stage process, as well as incorporating social processes. Singapore's long history experimenting with technologies, and well-documented case studies will provide a rich source of data to examine a collective action model of e-government.

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2.2 Analyzing and Designing E-Service Systems: Integrating Service Responsibility Table and Unified Modeling Language

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Services, such as insurance, banking, healthcare, and consulting, are defined in conventional economic literature as intangible goods. The service industry contributes to a great portion of gross domestic product in the developed economies. Driven by its increasingly important status in the economy, organizations worldwide strive to employ new innovations, including computer and network technologies, to improve the provision of various services. This offers many research opportunities for information systems scholars (e.g., Chesbrough & Spohrer, 2006; Rai & Sambamurthy, 2006)

There is a growing interest in applying computer technologies in the service industry. Rust and Kannan (2003) define e-service as the provision of service over electronic networks. The advantages of providing services over electronic networks include reducing operating expenses, allowing for personalization, and ultimately improving customer satisfaction (Rust & Kannan, 2003). The evolution from physical service provision to e-service provision may involve a reengineering process (Featherman & Pavlou, 2003), posing a challenge for business as well as IT professionals: how to effectively and efficiently develop e-service systems.

Typical information systems analysis and design approaches emphasize data, workflows, and objects in business settings. While they may have been successfully applied in developing some information systems, for several reasons it may be difficult to use those approaches to analyze and design service systems. First, most traditional information systems treat the system's customers as fairly homogenous users. In service systems, however, (service) providers and customers are two equally important yet different groups of "users." Second, although the fulfillment of a service request is typically considered as the core of a service system, activities related to awareness, negotiation, and follow-up are also important determinants of service performance. Existing analysis and design methods may not be able to fully explore these aspects. Third, the marketing and service literatures call for bringing the customer into the service system as a co-producer of services. This characteristic is not adequately addressed by existing analysis and design approaches. In view of their inadequacy, in this paper we propose a new approach for developing service systems.

A service system is a work system. Therefore, the work system framework (Alter, 2003) is introduced in this study as the foundation for the proposed method. According to Alter (2003), a service-oriented work system is a system in which human participants and/or machines perform work using information, technology, and other resources to produce services for internal or external customers. Four elements (processes and activities, participants, information, and technologies) constitute the work system, while other five elements (products and services produced, customers, environment, infrastructure, and strategy) are needed for even a basic understanding of a work system.

Based on the work system framework (Alter, 2003), the service value chain framework was developed to depict generic activities and responsibilities of both service providers and customers (Alter, 2007b). These activities and responsibilities may occur before, while, and after a specific service is delivered to a specific customer. Therefore, the service value chain framework is used as the basis for analyzing the activities and responsibilities of both service provider and customer, the first two issues raised above. Building on the service value chain framework, we introduce the service responsibility table (SRT) as a useful tool to analyze the co-production of services by provider and customer, and evaluate the complementarities between customer and provider responsibilities.

As shown in the example in Table 1, the simplest form of SRT is a two-column swimlane diagram, with

one column for providers and one column for customers, and with specific provider and customer roles indicated clearly.

Table 1: Two-Column Service Responsibility Table (SRT) for a Loan Approval System

Provider Activity or Responsibility	*Customer Activity or Responsibility*
Loan officer identifies businesses that might need a commercial loan.	
Loan officer contacts potential loan applicant.	**Potential loan applicant** agrees to discuss the possibility of receiving a loan
Loan officer discusses loan applicant's financing needs and possible terms of the proposed loan.	**Potential loan applicant** discusses financing needs.
Loan officer helps loan applicant compile a loan application	**Loan applicant** compiles loan application.
Loan officer and **senior credit officer** meet to verify that the loan application has no glaring flaws.	
Credit analyst prepares a "loan write-up" summarizing the client's financial history, providing projections of sources of funds for loan payments, etc.	
Loan officer presents the loan write-up to a senior credit officer or loan committee.	
Senior credit officer or **loan committee** makes approval decision.	
Loan officer informs loan applicant of the decision	**Loan applicant** accepts or declines an approved loan.
Loan administration clerk produces loan documents for an approved loan that the client accepts	

Use of a two-column SRT early in the analysis of a system potentially serves several purposes:
- It identifies step-by-step roles and responsibilities in the same table, thereby clarifying the scope and context of the service without requiring mastery of details that will be documented later through detailed representations of workflow and logic.
- It focuses attention on activities and responsibilities rather than on details of technology and information.
- It identifies the job roles that are involved.
- It brings customer responsibilities into the analysis.
- It identifies steps involving service interactions (rows with both provider and customer responsibilities) and other steps that are not visible to customers.

The format of a SRT facilitates easy reuse as the analysis proceeds. For example, it is easy to extend a two-column SRT into a three-column SRT by adding a new column for any of a number of topics that might be important for analyzing a particular system. Some empirical evidence supports SRT as a useful tool to analyze service systems (Alter, 2007a).

Analyzing the existing system is just the first step in developing an information system. IS professionals employ many formal or semiformal modeling methods in systems analysis and design activities. The unified modeling language (UML) is the industry standard modeling language for developing information systems (Kobryn, 1999). It is widely adopted by IT professionals and supported by CASE tools. With its emphasis on the use of technical artifacts, such as classes and use cases, it is not easily understood by business professionals, who may be providers or customers of services in a service system. A few empirical studies have found the business people have difficulty in learning and using UML (Dawson & Swatman, 1999; Siau & Loo, 2006; Erickson & Siau, 2007). Thus, there is a potential problem in the communication between IT people and business professionals in analyzing and designing a computer-based service system. To address this concern, we describe a set of heuristics for linking elements in SRT to UML constructs. In this way, we provide a linkage between business-side analysis (using SRT) and

technical-side design for developing service systems.

Use case diagram and class diagram are the two fundamental diagrams in UML (Booch, Rumbaugh, & Jacobson, 1999; Dennis, Wixom, & Tegarden, 2001). In the following, we provide a preliminary set of heuristics to transform SRT into UML use case diagram and class diagram.

To transform a SRT into a use case diagram:
Identify the various types of service providers and customers in a SRT and consider them as actors in a use case diagram; Identify the various activities and responsibilities associated with each type of service providers and customers and treat them as use cases in a use case diagram; link actors with corresponding use cases; show "extends" or "uses" relationship among use cases based on the analysis on SRT. As an example, the use case diagram (see Figure 1) is produced from the SRT by following the above heuristics (see Table 1).

To transform a SRT into a class diagram:
If we extend the SRT to contain a third column titled "information used or generated", the SRT will be able to help in creating the UML class diagram. The heuristic is as follows: Identify all of the information mentioned in the third column and decide what are the entity types, what are the related attributes, and what are the relationships between the entity types; Fill in missing entity types, attributes, and relationships; Produce class diagrams and decide whether they capture the true information requirements of the service system.

The research is still in its initial phase. The presentation at OASIS will help the authors to gather feedback and comments to move the research forward.
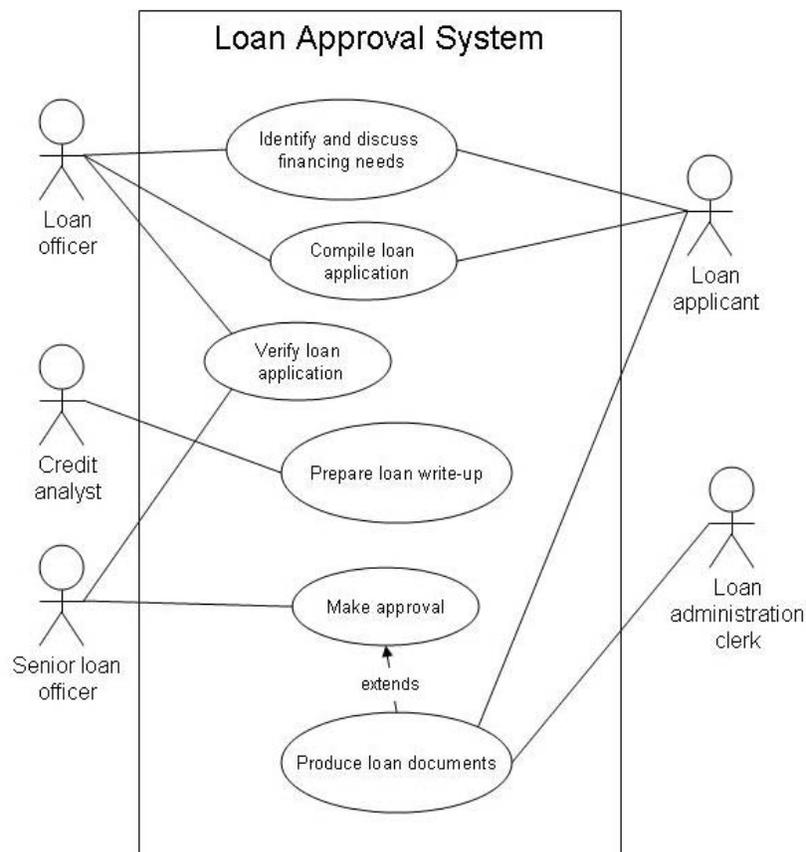
Figure 1: A Use Case Diagram transformed from the SRT for a loan approval system

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2.3 An Aspectual Analysis of E-Government

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E-government is a rapidly growing phenomenon and many governments are spending huge sums on e-government initiatives. The sad reality, however, is that very few e-government projects succeed. This might be because e-government is treated as e-commerce or e-business in government or even as the mere use of IT in the government sector. E-government systems are essentially information systems. They sit within the broader context of people, governmental agencies and departments, IT vendors, politics, culture etc. Successful implementation and management of e-government projects poses a diverse set of challenges. It follows that proper understanding of this diversity is critical to the success of e-government initiatives. Herman Dooyeweerd's Suite of Aspects, rooted in his philosophical work, provides a practical model to capture rich and diverse information about the issues associated with a research area. The diversity the Suite of Aspects allows is particularly suited to multi-disciplinary subjects such as information systems. Applying the Suite of Aspects to e-government facilitates an investigation that can consider the myriad perspectives of e-government to demonstrate this unique relationship between society, technology and theoretical frameworks. It is believed that the insight gained through this aspectual analysis of e-government will provide a richer understanding of the diverse set of issues associated with it, thereby providing practical pointers to the successful implementation and management of e-government projects.

2.4 Privacy and Security in E-Government from the Perspective of the Government Worker

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The research is a case study of a Texas state organization's provision of e-government services, including policies and work procedures and the regulatory and technological environments. The case study focuses on the experiences and perceptions of those working within government organizations, and in particular on their efforts to ensure the privacy and security of information pertaining to natural (individual) and corporate citizens which state agencies acquire, generate and manage as they provide e-government services.

Texas' e-government portal is TexasOnline, through which citizens can reach and interact with both state agencies and local government. Consistently highly regarded, in 2006 Texas'e-government presence (as represented by a review of web sites and services available through TexasOnline) was rated number one in the nation by Brown University's Center for Public Policy's annual ranking report "State and Federal E-Government 2006." (West, 2004 and 2007).

TexasOnline was developed and is supported today as a public/private partnership between the State of Texas and the consulting firm KPMG Consulting (subsequently contracting with Texas as the entity BearingPoint Corporation.) State and local agencies are free to avail themselves of different levels of contractor support in mounting their e-government presence. (Texas Department of Information Resources, 2006.)

At the same time, there are regulatory and policy requirements imposed on all state agencies regarding information privacy and security, management of electronic records and maintenance of the public record. Individual agencies must integrate not only their legacy information systems, but also their privacy, security and data handling policies with the requirements of TexasOnline.

The use of semi-structured interviews is used to elicit the experiences and opinions of employees whose judgments and work practices determine the privacy protection afforded to information identifiable as belonging to a specific [individual or corporate] citizen. The aspect of research methods with which we are now grappling is the best approach to analyzing the content of policy documents and work procedures, and if the method of analysis need be the same for institutional documents and transcribed interviews.

The case study methodology was chosen because it allows the use of both qualitative and quantitative methods of data collection and analysis, and is well suited for describing the internal and external environments that influence the resources, priorities and work procedures which determine how policy is executed.

There are many theories and research approaches that are brought to bear on information privacy and security. This paper is presented to solicit feedback and to widen the research network with scholars and colleagues interested in how such research might be leveraged by policy makers and government managers in the management and protection of citizens' information.

2.5 Design Theory for Service Oriented Architecture (SOA) Initiatives: An Action Research Approach

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Introduction

Service Oriented Architecture (SOA) is getting increased interest from world-wide businesses because of its potential promises and the push from heavyweight industrial giants such as IBM, Microsoft, Oracle, SAP, etc. In 2004 IBM released a research white paper based on the discussions from a summit of over 100 researchers from universities and IBM on the theme "the architecture of on demand business". The research white paper proposed a new academic discipline: Services Science. SOA and related technology, such as Web Services, are the cornerstones for higher level business integration, which is the subject of research in Services Science. The integration from the perspective of Services Science is quite different from IT integration in traditional sense. It is no longer sufficient to integrate single processes to achieve business agility; it must achieve a new level of integration among technologies and business processes to create business flexibility that in turn helps to increase business ability for innovation. Although Services Science is still in its infant stage and research regarding services and related technologies are developing, the potentials of SOA and Web Services have been recognized by businesses. A report (Cantara 2007) from Gartner shows that "SOA is entering the mainstream and is poised to cross the chasm, changing buying behavior."

SOA is a style of architecture that uses loosely-coupled services to promote service reuse and to speed up time-to-market. This increases the business agility. SOA not only takes into account the various aspects of information technology in an organization but it also addresses business process and the people of an organization. To build a SOA in an enterprise or transfer an enterprise's IT architecture into SOA, it needs to overhaul the business process and IT practices of the entire enterprise. It is a complicated process to implement SOA in an enterprise. Not much research has been done on how to implement SOA, where to start, and what is a successful path toward SOA. These are the research questions of this study. The objective of this study is to generate a set of design principles for transforming a traditional IT environment into an IT environment with SOA.

Literature Review

There is increased research interest in web services and service-oriented architecture in recent years. Both IEEE Computer and Communications of the ACM published special issues in 2003 on web services and service-oriented computing. Communications of the ACM published another special section on service science in its July 2006 issue. This issue is "intended to broaden and challenge traditional thinking about services and service innovation" (Spohrer et al. 2006). It tried to deliver the message that research of service is not just about web services and service-oriented computing. It brought up some new concepts in service research. Information Systems Frontier published another special issue regarding service computing in 2007. The articles in this issue fall into three categories: web service standard, business process management, and service-oriented computing (Zhao et al. 2007).

Although the potential values of web services and SOA have been recognized by organizations and research has been done on technical issues involving SOA, no research has been done on how to transform a traditional IT environment into an IT environment with SOA.

From a technical standpoint, SOA has four core components: business services, integration services, enterprise service bus, and infrastructure services (Keen et al. 2004). From an organizational viewpoint, SOA has three aspects: Business processes, Services, and Governance. These three aspects interact with each other to create enterprise agility. Business processes are the base to define useful services (usually implemented in web services technology). Well-defined services make it possible for business processes to be changed quickly. Governance is the key for successful service development and deployment. The

potential values of web services and SOA from the technical standpoint are well recognized. Transforming a traditional IT environment into one with SOA is an issue that is not well understood and urgently needs research. This is the research question of this study.

Thus far, research has been concentrated on the technical perspectives and issues of SOA. No design principle regarding how to implement SOA in organizations has been developed. Since SOA implementation will involve and affect every aspect of an organization, such as business processes, IT and business services (implemented in Web Services technology), and business and IT governance, it is important to have guidelines (principles) framed in an IS design theory to ensure effective, efficient, and successful SOA rollout in organizations.

Methodology and Expected Outcome

Walls et al. (1992) defined IS design theory as "a prescriptive theory based on theoretical underpinnings which says how a design process can be carried out in a way which is both effective and feasible." This perspective is shared by Markus et al. (2002), who stated, "IS design theories are intended to give guidance to developers." Gregor (2006) summarized five types of theories in IS research. Design theory falls into the category of Theory for Design and Action. This type of theory prescribes how to do things. It is about principles of form and function, methods, and justificatory (Gregor 2006).

Action research is seen as particularly appropriate for building design theory (Baskerville and Wood-Harper 1998). Action research has various forms and characteristics (Baskerville 1999). Our study will be based on Baskerville's (1999) participatory action research. Other than regular characteristics of action research, Baskerville (1999) pointed out that participatory action research is distinguished by the additional characteristic involvement of the practitioners as both subjects and co-researchers. An important change in participatory action research from traditional action research is "the realignment of the roles of researcher and subject into more collaborative and synergistic forms."

One author is currently actively involved in the SOA initiative in a large research public university, which will serve as the research site for this study.

The research is still in the early stage. The expected outcome of this study includes, but not limited to, a set of design principles for implementing SOA in an organization.

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2.6 To "E" or Not To "E", That Is the Question

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In 2001 and again in 2004, Kaarst-Brown and Evaristo (Kaarst-Brown and Evaristo, 2001, 2004) proposed that the uncertainty and ambiguity associated with Internet adoption posed a very dilemma for the small and very small retailer, presenting the independent bookstore as the classic example. They cited the losses experienced by highly publicized firms such as Amazon.com and the dot-com bust as examples of this uncertainty and ambiguity. Their rationale included the strategic challenges for the small and very small enterprise of interpreting mixed market signals while balancing several types of internal and external financial and knowledge resources. The Internet qualifies as a disruptive technology that can lead to higher business mortality, with many firms exiting the field (Anderson and Tushman, 2001).

More than 25 percent of independent book retailers exited the field in the years 1994 to 2000. In addition to normal attrition, the cause was attributed in large part to changes in the competitive structure of the field with more large retailers (e.g. Barnes and Noble, Wal-Mart, Grocery chains), as well as the disruptive impact of the new Internet technology (Emerson, 2000). In the past seven years, further changes have occurred in consumer expectations and experiences, new profitability of Amazon.com through line extensions beyond book retailing, and varying costs associated with maintaining an Internet presence. While there is anecdotal evidence that the Internet has put smaller firms and smaller bookstores out of business, is there any evidence that this alone is the cause? Can small and very small firms survive without a web presence? The question and dilemma remains for the small and very small enterprise, "to "E" or not to "E"?

As part of a six year longitudinal study, a sample of 134 independent book stores, representing 31 US states, has been tracked using a combination of survey and repeated measures of internet adoption and survival. Our findings suggest some interesting and contradictory findings. First, a web-presence may not be required to survive since almost 28% of sampled book stores do not have a website. Other organizational and knowledge factors may be equally important. Second, about 8% of very small firms adopt and then later cancel their web-presence, suggesting that a web-presence may not always produce the expected results. Our conclusion on the question of "to E or not to E" provides interesting new questions about industry survival through adoption or denial of disruptive technologies by smaller, resource-constrained firms.

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3.1 Online Cultural Fields or "The Topography of Online Cultural Spaces"

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An online cultural field (OCF) is a group of individuals, and the IT-supported relations among them, who share a cultural affinity and who, without directly interacting among themselves and often not even being aware of each other's existence, have an influence on the trajectory of other individuals in that field. OCFs occur, for example, on social bookmarking platforms, among (non-interacting) bloggers and on social networking websites. One can get an intuitive grasp of the range spanned by these social forms by thinking of them as "more than an Amazon.com co-purchase network, less than an online community."

By studying OCFs, one will create a topography of the cultural space, in which individuals are distributed based purely on the similarity of their cultural interests. This is an environment where cultural exchange happens freed from the yoke of actual social interaction and all the social-cultural cross-"contamination" which would necessarily result from such interaction.

Online cultural fields deserve attention from IS researchers for several reasons. First, two decades of study of online communities remain mute on these novel social forms which are not based on direct human interaction. Second, there are reasons to believe that OCFs will become a widespread phenomenon. Third, there is growing interest in the question of how to derive business value from the existence of these looser, more fluid online social forms. Fourth, studying OCFs offers the opportunity to conceptualize the online social use of technology in a way other than as a mere vehicle for the exchange of messages and/or the dissemination of documents.

The empirical work will be conducted by analyzing data collected from Del.icio.us (http://del.icio.us), a social bookmarking website. The theoretical background will be drawn mostly from Bourdieu's theory of fields (Bourdieu and Wacquant 1992), the literature on communities of practice (Lave and Wenger 1991) and that on social world theory (Strauss 1978).

The research agenda for this work is to address the following research questions:
1. Is the creation of cultural capital greater within or across OCFs?

2. Which participants in an OCF contribute the most cultural capital to the field?

3. Which participants in an OCF contribute the most novel/least common resources to the field?

4. What can be learnt from the different ways in which different OCFs tag the same resources?

5. To which degree are links in such spaces reciprocal? Does reciprocity vary depending on the individuals relative position in different fields?

3.2 Uses of Podcasting Technology to Enhance Teaching and Learning

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Grassroots social technologies, such as instant messaging, blogs, and podcasting are becoming increasingly more popular and form the essential elements of the daily life of millions of Internet users, especially the younger generation. In a traditional tertiary environment, lecturers are used to uploading teaching materials to universities' e-learning platforms, such as BlackBoard, and expect students to actively access the materials for the preparation of forthcoming lectures. However, only a handful of students will perform these tasks before the lectures commence. To encourage students to actively access teaching materials before the classes are conducted, we propose to use Podcasting and RSS technologies to notify students as soon as the teaching materials are available.

Podcasting and RSS technologies are one of the most popular social technologies adopted by young Internet users. We expect that some of these young Internet users have experienced the advantages of such social technologies and they would carry over the use of these technologies from leisure to learning. Furthermore, with grassroots social technologies, active learning can be encouraged if the learning tasks fit with the technologies.

A group of around 250 students were invited to participate in this study. A survey was conducted to examine the students' current practices of using Podcasting and RSS technologies at the beginning of the fall semester this year. During the semester, teaching materials will be uploaded to Blackboard; students are notified of the availability of the teaching materials based on RSS; the students can then download the materials to their handheld devices (**PDA is the device we recommend to our students). At the end of the semester, another survey will be conducted to examine students' actual usage of these technologies.

To study the effectiveness of using podcasting and RSS technologies to encourage learning, task-technology fit theory will be the main theoretical building block for the instrument development. The task-technology fit concept can be applied to explain the reasons why social technology users choose particular technologies for specific tasks. Another theoretical foundation is based on spillover theory, which describes the carryover between home experiences and work-place experiences. Spillover theory can be used to explain why students use such "leisure and social" technologies for learning purposes. To further triangulate the findings, focus group discussion and individuals interviews will be conducted.

3.3 Sharing Knowledge in Cyberspace: A Study of Wikipedia

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As the Internet opens for network participants, knowledge sharing in cyberspace is not occurring spontaneously (Wasko & Faraj, 2005). With limited social cues and social presence, knowledge sharing in cyberspace is based on the "kindness of strangers" (Constant et al., 1996). However, the rapid extension of Wikipedia has challenged our current understanding toward sharing knowledge in cyberspace. This study conducts a case study to explore knowledge sharing in the cyberspace. Our investigation is anchored on knowledge sharing behaviors in Zhongwen Wikipedia among the Taiwanese contributors. Applying grounded theory, our findings suggested that knowledge sharing in the Zhongwen Wikipedia emerged in three phases: individual contribution, group collaboration, and community support. Through describing the interactions among environmental structures, contributors' interpretive schemes, developed norms, and behaviors, this study attempts to provide a satisfactory explanation of the knowledge sharing pattern.

In the beginning, the free volunteers joined Zhongwen Wikipedia with an agreement of the vision of Wikipedia. In this stage, the knowledge sharing came out as task-oriented behaviors which focus on contributing what the participants know in the way of writing an encyclopedia. Knowledge sharing was mainly an individual based contribution. When the participants continued the editing work, the exchange of ideas for solving conflicts through interactions increased and became very essential. The behaviors in this stage, therefore, were enacted as group collaborations. After that, the frequent interactions made it easier for the participants to develop interpersonal relationships and thereafter changed the original structure of the cyber environment. The participants became friends, and found that they have a similar identity in which they called themselves "Wikipedians." The identification of Wikipedia and Wikipedians created a virtual community. In this stage, knowledge sharing was observed as various ways to support each other in both work and emotion.

3.4 The Evolution of Personal Knowledge Management

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Knowledge management methods and tools provide different structured frameworks to collect, store and share information. However, the real place of knowledge is in the minds of people and not in a tool, even if this tool is the best software ever built. Knowledge is a product, but it is also and mainly the process by which this product is produced. It is quite difficult to use such a tool of knowledge management if the user is not familiar with the way the information is structured within it. One of the reasons for the expansion of the web 2.0, the main characteristic of which is that information is produced by the community, is that people looking at this information do not care about the way it is structured (because it isn't). Therefore people can embed information as knowledge in a way they are used to and in the way they prefer and not from a different point of view imposed by somebody else (which is how knowledge management systems proceed). It is like the difference between a traffic light and a roundabout at a junction: in the case of the traffic light, the information for the driver is codified into and delivered by the system. The driver doesn't care about the context, but only about the traffic light. The driver's behavior is governed by the system and its rules. In the case of the roundabout, there is no system; the roundabout is the context from which the driver has to collect and process information in order to decide on behavior. Should we see in this structural difference in knowledge processing the reason why traffic lights are regularly disappearing and replaced by simple or multiple roundabouts? Mr. Davenport, knowledge management is not dead; it is just engaged in a Darwinian evolutionary process to fit the users' needs!

This paper analyzes this evolution. We present our research project around the way people manage their personal knowledge, mainly the way they collect, store and share their information. Practices, needs, methods and tools in the field of personal memory management are also addressed.

3.5 Empowering the Internet Masses: A Critical Analysis of Digg

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The management literature has highlighted organizational effectiveness through the notion of employee empowerment. Empowerment is defined as enabling an individual to become more involved in the decision-making process. Four core aspects depicting empowering organizations include: "the provision of information, power, knowledge and rewards to employees" (Psoinos et al., 2000). Information systems have been viewed as a supportive tool for the distribution of information and knowledge thereby enabling empowerment, though not able to initiate this practice.

The idea of empowerment is not limited to organizations but rather is prevalent within society, most notably following widespread internet use. Empowerment in this context can be seen as synonymous to user-generated content, where individuals are enabled to contribute directly through the internet. The pervasiveness of message forums, weblogs, wikis and differing forms of social networking websites exemplifies the extent of empowerment. Furthermore, society has recognized this shift in influence from a select few to the vast majority, as is illustrated by Time Magazine's 2006 person of the year: you. This award acknowledges the growing significance of individuals and their impact on community and collaboration.

In an organization, empowerment comes with controls in the form of structural boundaries, accountability and responsibility (Duane and Finnegan, 2003). These restrictions are not always applicable in the unbounded internet environment. In this context, information technology continues to play a key support role in enabling a greater number of individuals to contribute, however, it also affords individuals the potential to initiate empowerment. As such, by empowering individuals on the Internet, system administrators may face unintended consequences.

Using an interpretivist case study method we illustrate how individuals, empowered through the use of information technology, reach an objective which is in contrast to the imposed controls and structure. Users of the popular website Digg, where the collective determine what content is valuable through voting, took control of the system in an unintended way when the system administrators attempted to censor content and intervene in the decision making process. Critical theory can provide insight on empowerment, since both focus on the emancipation of individuals (Habermas, 1972). The rich qualitative data in the form of user comments, story submissions, number of diggs and web traffic surrounding this event allows for a retrospective case study. Using critical theory as a lens to explain this phenomenon, we propose that information technology can be used by the masses to overcome censorship and structure. Furthermore, we question the digg outcome: was this a failure in the system, or a success in the emancipation of its users?

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3.6 Blogs and Professional Identity Construction

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Social software such as blogs has been receiving wide attention from both practitioners and researchers (Tepper, 2003; Parameswaran and Whinston, 2007). Blogs are user-centered content generation tools. Individuals can easily generate contents by using easy-to-use and freely available blog templates on the net. Individuals can manage information easily and effectively by utilizing the capabilities of blogs such as folksonomy and/or social bookmarking. Blogs have been changing the way individuals communicate and exchange information with each other. For example, individuals create their own blog space (e.g. Myspace) and keep their contact with friends and family members. Because of the increasing popularity and the attractive features, blogs have become of interest to corporations (Lee, Hwang, and Lee, 2006; Dearstyne, 2005; Tredinnick, 2006; McAfee, 2006). Lee, Hwang, and Lee (2005) studied corporate blogs that are accessible in public and investigated how corporations control security features of blogs. Jackson, Yates, and Orlikowski (2007) studied how an internal corporate blog was used in a large IT organization.

Past research regarding how and why individuals use information technologies found that they employ technologies for self-expressions. Through the use of IM, individuals may use an avatar as an icon that expresses their identity. Through the use of e-mail, individuals customize their e-mail signature and background to demonstrate their personality. Individuals use IT to create their own personal identity by managing self-expression. The way individuals construct their identity is also influenced by social identity. Social identity is based on an individual's social role such as an occupational role, a family role, and so on. When individuals work for a company, they are assigned several social roles such as employees, managers, analysts, software engineers. An individual's self-expression style may be influenced by his/her assigned social roles.

In this paper, drawing on the work of Goffman (1959) and social identity literature (e.g. Tajfel, 1981), I will present an on-going study of how corporate employees construct their professional identities. Corporate blogs of two companies are analyzed and discussed. Implications for practice include corporate security and knowledge management. Corporations are facing a dilemma about how they utilize blog for their benefit without losing control. Inappropriate use of blogs may cost both individuals and corporations. Understanding how employees use blogs is an important step for corporations to prepare for secure use of blogs. This research will contribute to the area of impression management and online identity management.

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4.1 Understanding How Information Technology Facilitates the "Front End" of the Innovation Process

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The earliest stages of the innovation process are often called its "Front-End." The Front-End of Innovation (FEI) is a divergent and non-linear process consisting of activities such as idea genesis, idea selection, opportunity analysis, opportunity identification and concept and technology development [3]. It requires redundancy, creativity and interaction for analyzing and solving complex problems. A review of the FEI research indicates significant potential for applying IT to FEI activities [1,2,4,5]. While the role of IT in other stages of innovation such as project management, technical assessment, product design, and testing is fairly well understood, the role and value of IT at the FEI has not been well studied, and is the focus of this research. Our research question is, "How can IT best facilitate and encourage innovation at the Front End?"

We have collected data from over 100 R&D and innovation managers from more than 50 companies. We have used a variety of techniques - nominal group exercises, focus-group interviews, individual interviews, multiple case studies and short questionnaire – and have rich data on a broad range of perspectives from different companies, on their use of IT in the FEI.

Preliminary data analysis has revealed five ways in which IT can support activities in the FEI. First, IT can be used for collaboration among innovators. Organizational innovators need to identify and work with others having the complementary skills. The use of tools such as email, electronic bulletin boards, expertise directories, teleconferencing, portals, blogs, and wikis for idea genesis and idea generation is critical to the success of the FEI. Second, IT can be used for gathering competitive intelligence. Successful innovators need to understand their firm's strategic direction, its intellectual property portfolio, what innovations will be most valuable, and what competitors are developing. The use of IT-based tools, including subscription data services, Web search tools, and patent search and analysis tools for competitive-intelligence and data-gathering process aids in opportunity analysis and identification. Third, IT is used for knowledge management and to let innovators access and mine organizational knowledge. This is done through central knowledge repositories, portals, and document management systems such as Lotus Notes.

Fourth, innovators can use IT for data analysis and modeling, for prototyping and for uncovering insightful relationships and patterns that are often hidden in the massive amounts of data available to them. This helps to analyze the feasibility and appropriateness of innovation ideas before incorporating them as formal innovation projects, and helps in opportunity identification and concept and technology development. Fifth, innovators can use IT for visualization. Visualization tools, such as computer-aided design are central to the jobs of many engineers and designers. They provide powerful ways to prototype and immediately and effectively observe the impact of changes in design parameters, helping in idea selection and concept and technology development.

Currently data analysis is on–going, as we attempt to identify further ways in which IT can facilitate FEI activities and to identify best practices in the use of IT in the FEI. Our interest in this workshop is two fold. First, this being a relatively new area of study, we hope to present some of our findings for feedback and further refinement as we move forward with data analysis and dissemination of the results. Second, we hope to contribute to and benefit from discussions on qualitative data analysis methods.

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4.2 Seeking Data for Reuse: An Exploratory Study of Earthquake Engineers

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In the last several years, there has been a movement in the scientific and engineering research communities to share resources to allow for more rapid, innovative discoveries. A major objective in many of these communities is to capture and store scientific and engineering data for secondary use (i.e. reuse). Much of the early effort has focused on creating metadata models to capture the who, what, where, and when about the data being collected or establishing standards as to how data should be collected, described, and stored. Over the course of a research project, original data collectors often create additional documentation about their study. Yet, there has been less emphasis on whether and how this data documentation might be useful for individuals seeking that data for reuse. The objective of this exploratory study was to understand how earthquake engineering researchers currently seek data for reuse to determine whether there is a role for the original data collector's documentation. Interviews with 17 earthquake engineering researchers were conducted during the summer of 2007. Respondents were asked how they located and evaluated data for reuse as well as the challenges associated with data reuse.

Preliminary analysis showed three information sources that were important in addition to the data: 1) peer reviewed publications (i.e. journal articles, conference papers and presentations), 2) data documentation, and 3) the original data collector. Each of these information sources had a particular role during the process. Peer reviewed publications were used to locate relevant data for reuse. Although they provide some indication of data quality, the researchers were more likely to use them to extract high level information about a research study and to remain current about research developments in their area of interest. The data documentation was used to critically evaluate whether to reuse the data. Good data documentation provided more than what is traditionally thought of as metadata, such as diagrams showing how channels were instrumented, explanations about why certain materials were used, or descriptions about how specimens were attached to a base. The quality of the documentation—not the reputation of the data collector—was often used as a means to reject or to continue evaluating the data for reuse. The original data collector provided the data and data documentation. When data documentation was good, few earthquake engineers seemed to require extensive conversations with the original data collector to understand the data. Instead, original data collectors seemed to field questions or fill gaps regarding problems, quirks, and complexities related to the data. Preliminary findings from this exploratory study have begun to outline what besides the data is important for data reuse; the next step is to describe the implications for theory and practice in the context of shared data repository design, development and use.

4.3 From Willow to Oak? Change Agentry Models CIOs Follow During Their Tenure in Office

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Information Systems research has investigated what roles CIOs should play and what factors makes them effective in these roles, but has paid very little attention to when CIOs are more likely to be effective in their various roles. To fill this gap, this paper focuses on the role of change agent, and examines how and why this role evolves for CIOs as they progress in their tenure in office.

In their dealing with IT related change, CIOs may follow three ideal models of change agentry or combination thereof: the traditional IS model, the facilitator model and the advocate model. Effective CIOs are those able to follow the most appropriate model or combination of models of change given the nature of their environment. The question remains, however, whether CIOs are always able to choose. The management literature shows, indeed, that top executives are not as effective at managing change at the end of their tenure as they are at the beginning, which would suggest that there may exist a set of evolving factors limiting CIOs in their choice of change models, thereby affecting their effectiveness as change agents.

Drawing from the Management and IS literatures and empirical data from CIOs interviews, this paper proposes a three-stage model ("Conquest," "Exploration" and "Settlement") describing what combination of change agentry models CIOs follow as they progress in their tenure in a particular position and why.

This study suggests that CIOs predominantly follow the "advocate" model of change agentry at the beginning of their tenure, and combine both the "advocate" and "facilitator" models as they progress in their positions. As they reach the end of their tenure, CIOs mainly adhere to a balanced combination of "facilitator" and "traditionalist" roles. The combination of change agentry models CIOs tend to follow during their time in office is explained by the patterns of evolution of 5 key characteristics: commitment to a paradigm, task knowledge, information diversity, task interest and power and influence.

Beyond contributing to our limited understanding of the role of CIOs as change agents, this study provides the foundations for exploring questions about when CIOs are effective in their various roles, and how this may ultimately affect the performance of their organizations. Practically, the model should help individual CIOs make better decisions about their careers, and contribute to adding value to their firm, and should also help organizations better manage the CIO position by providing guidance on whether and when recruiting new ones. Finally and more broadly, this study is also an important reminder to IS research not to neglect the temporal dimension of the organizational and individual characteristics it studies. CIOs have long lasting personality traits that shape their beliefs, attitudes and behaviors about IT and IT related change, but they must also learn during their time in office to adapt to and operate within their environment, a process that undeniably takes time.

4.4 The Impact of Early Exposure to the Information Technology Occupational Culture On Information Systems' Employees in Organizations

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Information systems are ubiquitous in today's organizations and the essential role of information systems' employees is generally recognized. In recent years, information systems (IS) related majors experienced a decline in enrollment. Fagnot, Guzman and Stanton (2007) argued that early exposure to the characteristics of the IT occupation influences the retention of students in IS majors and Information Technology (IT) professionals in the occupation. Recent studies on the IT occupational culture have uncovered characteristics of the culture of the IT professions (Akbulut & Looney, 2007; Guzman, Stanton, Stam, Vijayasri, Yamodo, Zakaria & Caldera, 2004). Findings from a previous research project on IT occupational culture[1] suggest that people become aware of the cultural features of the occupation only when they obtain work experience in the field (Guzman, Sharif, Blanchard, Ellis & Stanton, 2005).

This research in progress aims at evaluating the impact of an early exposure to IT occupational cultural characteristics on the commitment to the profession. In summary, this exploratory study is looking to answer the following question:

RQ: What is the impact of early exposure to cultural characteristics of the IT occupations on IT occupational commitment?

This research study draws upon the principles of Inoculation Theory (McGuire, 1964). Inoculation theory aims at strengthening existing attitudes, beliefs, and behaviors against change. McGuire (1970) argued that a weak attack can inoculate an individual against subsequent attacks to his or her attitude by providing a weakened form of that attack and then refuting it. If the attack is too strong, then existing attitudes, beliefs, and behaviors will get weaker. According to Pfau, Kenski, & Sorenson (1990) the following steps comprise an effective inoculation procedure: Warn the listener of the impending attack, make a weak attack, and have the listener actively articulate defenses against the attack.

A mixed method is employed for this research project. The data collection is tri-fold: 1) Anonymous paper surveys were conducted with freshman students at a School of Information Studies to inquire about their perceptions and beliefs on the IT occupation; 2) semi-structured interviews will be conducted with IT professionals currently working in the field. These interviews will either be face-to-face or phone interviews. Their aim will be to uncover what challenges they have had to face at the workplace and how they have handled those situations; 3) video clips of these interviews will be used to develop a workshop for students to prepare them to situations they may face at the work place.

This research study will make a significant contribution to the organizational culture literature as well as the IT occupational literature. It will also make a valuable contribution to the practitioner community by augmenting practitioners' awareness of cultural issues of the profession and how to better manage IT personnel.

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4.5 Accountable or Casual Anonymity? A Classification of Anonymity Based on Linkability

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Though anonymity on the Internet has been studied in various fields, classification of anonymity has been fragmented. In the Computer-Mediated Communication (CMC) area, several experiments and research have shown that anonymous communication brings both more self-disclosure and disinhibition than face-to-face, or identified communication (Connolly et al.1990)(Bargh et al.2004). In this context, anonymity means "visual anonymity", thus a sustainable handle and a one-time handle have not been distinguished (Joinson, 2003).

As noted by "Anonymous" in 1998, anonymity is defined as the "degree to which a communicator perceives the message source as unknown or unspecified" (Anonymous, 1998). One major classification of anonymity has the following three levels: fully anonymous, partially anonymous "pseudonym" and fully identified. But, what does "fully" mean?

To categorize anonymity, we focused on "linkability" from the "Anon terminology paper" annually updated by Pfitzmann et al. (Pfitzmann et al., 2000-2007). If there is no linkability between any messages, we are not able to re-construct the personality of senders, so Unlinkability brings the more anonymous condition (Figure 1).
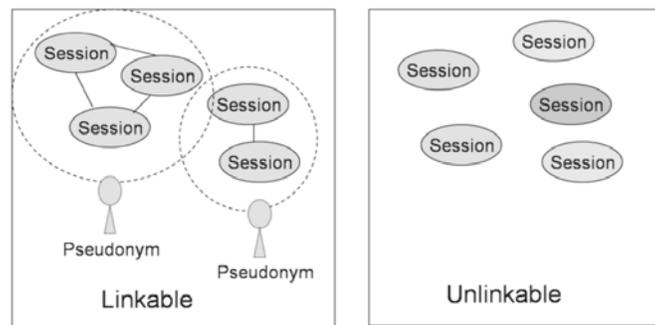
Figure 1 Linkability and Unlinkability

We focused on the area of User-Generated Content (UGC), where users interact and support one another, though they are visually anonymous. The so-called Web 2.0 encourages users to publish their own content and comment on other people's expressions. Examples of UGC are as follows: BBS/Discussion Boards, Blogs, and SNS, Review sites, Answers and Questions and so on. Some UGC platforms allow postings without registration; others require e-mail authentication and use pseudonymity, a unique handle. In Japan, the largest BBS "2ch" has been believed to be a fully anonymous environment, but they adopt generated-ID system, which realize linkability, to 70% of forums to prevent "strawman sockpuppets".

Based on linkability and its browsability, this paper proposes this categorization of current UGC (Figure 2).Category [A] brings the weakest anonymity but assures accountability to some extent. Category [B] brings higher anonymity. These categories include "fully identified" and "partially anonymous" communication. Category [C] brings the highest anonymity, which is thought to be "fully anonymous".
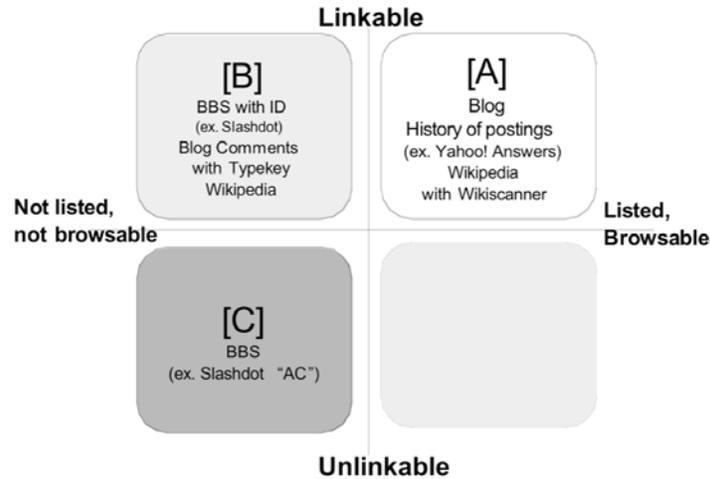
Figure 2 Linkability and List/Browsability

Depending on the purpose of the UGC platform, the level of anonymity can be selected (Table 1). To assure accountability, it is better to share background and history like category [A], on the other hand, however, a barrier against self-disclosure still exists. Category [B] prevents spamming and sockpuppets. Category [C] tends to cause spamming, framing, and other disinhibition, but most effectively encourages self-disclosure by avoiding prejudice and defamations.

In Japan, for example, where users tend to be anonymous on the Internet, 60.9% of users never use their real name while only 5.2% of users use their real name. On the other hand, the use of UGC is maturing (Internet White Paper 2007). From our survey on "MICRODIET" users in 2006, consumers tend to trust description by linkable ID registered users (Category [A] and [B]), but once they become senders of information, they tend to select the more highly anonymous platform (Category [C]) (Orita et al. 2007).

Thus, this paper proposes this classification of anonymity for future analysis of several kinds of UGC platforms.

Table 1: Classification of anonymity among UGC

Anonymous Level	Category		UGC Example
Weak	[A] Linkable and Browsable	Comment and history with sign in.	Blog, Wikipedia(Wikiscanner) Yahoo!Answers, Amazon review
	[B] Linkable, NOT Browsable	Comment with sign in.	BBS with ID, Wikipedia, Blog comments with typekey, Slashdot
High	[C] Unlinkable	Comment without sign in.	BBS without ID "AC" in Slashdot

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4.6 Neuroscience and Management Information Systems

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The existence of important theoretical constructs in MIS research (e.g., user satisfaction or technology acceptance) has been postulated from empirical evidence found by investigating a construct's operationalizations in combination with traditional data collection methods such as surveys. In contrast to metrically scaled variables in MIS research such as response time, number of functions used, or frequency of Internet access (DeLone and McLean 1992), theoretical constructs are neither directly observable nor objectively measurable. Since perception, cognition, and judgement formation emerge from the human brain, any methodology that does not directly investigate the processes in the human brain may be considered as indirect measurement. Hence, not only questionnaire-based measurement, but also observation of user's behavior and self-recording by the user are assumed to be indirect measurement techniques.

Because of recent achievements in neuroscience technology, feelings and thoughts can be measured directly now (Camerer et al. 2004). Since user satisfaction, technology acceptance, and similar theoretical constructs in MIS research are feelings and/or thoughts (Giese and Cote 2000), it is likely that future research efforts will allow for directly measuring theoretical constructs in MIS research.

Existing empirical studies demonstrate the potential of neuroscience techniques for scientific progress in the MIS discipline. Consider, for instance, a study performed by Sanfey et al. (2003). They used functional Magnetic Resonance Imaging (fMRI) to investigate brain activities of players of the Ultimatum Game. In this game, two players are given the opportunity to split a sum of money (in their experiment $10). One player is deemed the proposer (player 1) and the other one is the responder (player 2). Player 1 makes an offer as to how the money should be split between the two. Player 2 can either accept or reject the offer. If it is accepted, the money is split as proposed, but if player 2 rejects the offer, then neither player receives anything. In either event, the game is over.

Sanfey et al. (2003) found that unfair offers of $2 and $1 made by human partners were rejected at a significantly higher rate than those offers made by a computer, suggesting that participants had a stronger emotional reaction to unfair offers from humans than to the same offers from a computer. Among the brain areas showing greater activation for unfair compared with fair offers from human partners were bilateral anterior insula, dorsolateral prefrontal cortex (DLPFC), and anterior cingulate cortex (ACC). The magnitude of activation was also much greater for unfair offers from humans as compared to unfair offers from computers. This suggests that these activations were not solely a function of the amount of money offered to the participant. Rather, the activations were sensitive to the perceived unfair treatment from another human.

In another experiment, a Positron Emission Tomography (PET) study performed by Haier et al. (1992), participants' brains were imaged at different points in time as they gained experience with the computer game Tetris, which is a falling-blocks puzzle video game. This game requires rapid hand-eye coordination and spatial reasoning. It was found that when participants began playing, they were highly aroused and many parts of the brain were active (Figure 1, Naive). As the participants got better at the game, overall blood flow at the brain decreased. Hence, activity became localized in only a few brain regions (Figure 1, Practice). Participants who improved their Tetris performance the most after practice showed the largest glucose metabolic decreases after practice in several areas. This suggests that learning may result in decreased use of extraneous or inefficient brain areas. Changes in regional subcortical glucose metabolic rate with practice may reflect changes in cognitive strategy that are a part of the learning process.
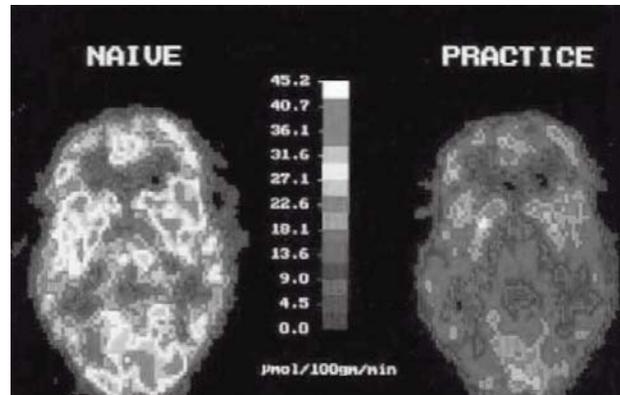
Figure 1: Regions of brain activation when first playing Tetris (left)
and after several weeks of practice (right) (Haier et al. 1992)

On October 15, 2007, a new patent application of Microsoft Corporation, Redmond, WA, became known in public (Tan and Lee 2006). One out of the many comments in the press was: "Microsoft mind reading". Mullins (2007), a NEW SCIENTIST journalist, described the patent application in a few sentences:

The company says that it is hard to properly evaluate the way people interact with computers since questioning them at the time is distracting and asking questions later may not produce reliable answers. "Human beings are often poor reporters of their own actions," the company says. Instead, Microsoft wants to read the data straight from the user's brain as he or she works away. They plan to do this using electroencephalograms (EEGs) to record electrical signals within the brain. The trouble is that EEG data is filled with artefacts caused, for example, by blinking or involuntary actions, and this is hard to tease apart from the cognitive data that Microsoft would like to study. So the company has come up with a method for filtering EEG data in such a way that it separates useful cognitive information from the not-so-useful non-cognitive stuff. The company hopes that the data will better enable to them to design user interfaces that people find easy to use. Whether users will want Microsoft reading their brain waves is another matter altogether.

Considering Microsoft's patent application, other industry research efforts (e.g., in the gaming industry, www.emotiv.com), and the various research efforts at universities in several scientific disciplines (from medicine to neuroeconomics) around the globe, we predict that measuring MIS constructs by means of neuroscience methods will affect the future development of the IS discipline.

We would like to close this abstract by citing Spitzer (2006), who has written the minutes of the First Meeting of the Society for Neuroeconomics, which took place in 2005: "Everyone is a newcomer to this field, and so everyone has come with an open and attentive mind, willing to share and willing to learn" (p. 68).

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5.1 Shared Leadership in Distributed Teams

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Introduction

Free/Libre Open Source Software development (F/LOSS) teams are teams that use information and communication tools to collaborate and coordinate their work. Fielding (1997) identifies these teams as teams with shared leadership. Leadership is important for these teams since it contributes to team continuity and success. Pearce and Conger (2003, p. 2) suggest that our understanding of the dynamics of shared leadership is quite primitive despite the urgency to understand it. This study will study the shared leadership dynamics within the F/LOSS context, especially to try to answer the following questions: What are the leadership roles in successful distributed shared-leadership teams? Which leading behaviors make up these roles? How does the nature of shared leadership change over time in successful distributed teams?

Research Methods

This study will employ a multiple embedded case study design. The units of analysis are team and leadership behaviors. The cases are selected based on literal replication logic using the success criteria according to Crowston, Annabi, Howison and Masango (2004) as well as six other selection criteria that include: the criteria for being a distributed team, team size, current project lifecycle stage and availability of data.

To understand the full interaction among the team members, this study will utilize interviews and observations during face-to-face meetings and content analysis of the online communication data and data on software modification. Content analysis will be conducted using a coding schema based on the theory of two-order leadership (Heckman, Crowston, & Misiolek, 2007)

Progress to Date and Initial Findings. Pilot interviews confirmed the literature that these teams have shared leadership. Interviewees identified some people "as leaders" without being prompted based on the knowledge and experience they have and for communicating a vision. At the same time, when asked questions on who exhibits some specific leadership behaviors, they identified others who specialize on a task or software module.

Furthermore, team members identified leadership change over time based on the level of involvement of the leaders, thus confirming the behavioral aspect of leadership. Currently the interview protocol is being revised based on the pilot and interviews will be conducted in November 2007 with two F/LOSS teams.

A deductive content analysis framework is created and is currently is being revised and finalized inductively. The results of the content analysis, interviews and observations will be presented in this session.

Expected Contributions

This research will identify which leadership roles have greater significance for shared leadership of self-organized distributed teams. This will contribute to the literature by providing a comprehensive, well defined set of leadership roles on which to explore and test hypothesis. Furthermore, this study will fill a void in the literature by studying shared leadership longitudinally and identifying if and how leadership changes over time. This study will also help identify leaders and leadership dynamics at any point in time in F/LOSS teams as well as other teams that collaborate and coordinate their work via information and communication technologies by developing a content analysis tool.

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5.2 Collaboration in Partially Distributed Teams

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Virtual teams have been seen as a promising way of organizing work for organizations to cope with today's rapidly changing business environment (Townsend et al. 1998; Powell et al. 2004). In this research, I am interested in exploring collaboration issues in a specific type of distributed teams, partially distributed teams. Partially distributed teams are those that have some team members collocated at one site and others at some other site(s). Members collocated at the same site form a sub-team. Sub-teams are usually geographically dispersed and rely on ICT to communicate. Partially distributed teams are now widely used in organizations, especially in global software development. But few studies have focused on this type of distributed team (Huang and Ocker 2006).

My interest in this topic was inspired by some interesting findings from a field study I conducted for my dissertation. In that study, I interviewed some Chinese IT professionals in a global IT company on their virtual working experiences with non-Chinese. When I asked how people were distributed in a virtual project, I was told the following three situations: 1) "I'm the only Chinese in this project"; 2) "XX (a colleague from the same site) and I are working on this project"; and 3) "we usually have several people here together working a same project. We have a project manager to be responsible for communicating with others outside our site". These three situations apparently implied different team structures and led to different collaboration modes. For example, for the first situation, Chinese members felt that they must be fully engaged in both task and social conversations with other team members. Though it is pretty much the same for the second situation, the Chinese members felt much more confident because there was another Chinese on the same team. For the third situation, except the project member, most Chinese members did not need to have personal communications with other parts. Almost all their communications were conducted through the project manager.

So I would like to explore this phenomenon further. I am interested in understanding how the configurational characteristics of a distributed team influence collaboration among team members. Here I will adopt O'Leary and Cummings (2007)'s definition of configurational dimensions of geographical dispersion in teams, which means "the number of sites at which members are located, their isolation from other members, and the balance between subgroups of members across sites" (p.434). To date, most research on virtual teams has focused on spatial and temporal aspects of distributed teams (Majchrzak et al. 2000; Kayworth and Leidner 2001/2002; Fiol and O'Connor 2005), little research has studied configurational aspects of virtual teams.

Theoretically, I am thinking of drawing on literature of Social Identity Theory, boundary objects and boundary spanning as theoretical backgrounds. A multiple-case study is proposed for this research and semi-structured interviews are proposed to collect data to provide a comprehensive and detailed understanding of the following research questions:
1. How do the three configurational dimensions described above affect collaboration patterns among members in sub-teams and those between sub-teams?
2. What other factors mediate the effects and how?

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5.3 The Successful Configuration of Global Agile Teams

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The combination of agile development methods and global software development via virtual teams represents an emerging approach to addressing the challenges typically associated with software development projects. The prevailing viewpoint contends that agile methods are not applicable in global settings. However, due to the perceived benefits of these two approaches individually, there is growing interest in the issue of whether distributed software development as a whole can be agile. This raises the question of whether or not it is possible to successfully implement agile methods in globally distributed environments. There is some current research which indicates that it is indeed possible. If this research holds true, the actual configuration of globally distributed agile teams appears to represent a significant area of study which thus far has received little attention. Based upon a review of the literature, many of the challenges associated with the individual use of agile methods, global software development, and virtual teams overlap and represent possible hindrances to the successful configuration of globally distributed agile teams. Strategic challenges involving the division of work across distributed sites is a key to success. Because team members are dispersed across the globe, many cultural challenges exist including language, attitudes, values, conflict management, and competencies. Related to culture are formal and informal communication issues, building relationships, trust, and cohesion. Geographic challenges related to distance, time zone differences, coordination and control, and vendor support are also a given. In addition, knowledge and project management also pose a significant challenge. Finally, the technical aspects revolving around network capability, software, compatibility, and communication technologies play a significant role. We, therefore, pose the following research question: How can agile teams be successfully configured in globally distributed environments?

Due to the complex nature of this topic, the need to examine the phenomenon within its natural setting, and the limited amount of research that has been conducted in this particular area, the study will utilize an embedded multiple-case study research design. The primary data collection method will consist of in-depth, semi-structured interviews with program managers, project leads, and team members of globally distributed agile teams within two large, global organizations. An interview protocol and coding scheme have been developed based upon the extant literature and interviews are currently underway. Additional data will be collected through various forms of documentation and archival records. Within-case and cross-analysis will be used to analyze and evaluate the data that is collected. The purpose of the study is to identify emerging themes or patterns which contribute to the successful configuration of global agile teams through the use of pattern-matching analytic strategy and literal and theoretical replication logic. The study will contribute to the information systems field by providing a starting point towards theory building in the area of globally distributed agile teams.

5.4 The Centrality of Trust in Virtual Communication: Relating Modes of Relational Communication to Performance in Online Learning

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The purpose of this research is to investigate the importance of modes of relational communication in virtual settings such as work-related interactions between dyads of members of virtual teams. While we are interested in interactions in virtual teams in general, we focus on a specific type of virtual environment, online learning, and on a specific dyad from the virtual classroom, that of the student and the instructor. In our research model, we highlight the central role of trust in mediating the behaviors of the instructor and the preferred modes of relational communication of the student on both subjective and objective performance of the student.

The motivation for this study comes from the increasing use of virtual teams and the new structural and leadership challenges they present - challenges that have not yet received adequate research attention despite the great potential of virtual teams (Bell & Kozlowski, 2002; Martins, Gilson, & Maynard, 2004). Similarly, the online learning environment has brought radical change and increased potential in the format of education. While online learning means an educational institution is no longer confined within the limitations of geographical boundaries, recent studies about the effect of being virtual on student perceptions of characteristics such as accessibility and outcomes yield mixed and sometimes competing results (cf. Phillips & Peters, 1999; Marks, Sibley & Arbaugh, 2005).

In an attempt to synthesize findings from work on computer-mediated communication and online learning environments, we propose that modes of relational communication, or preferences in the way in which individuals communicate with each other (e.g., Walther, 1995), have an important influence on the performance of students. The five key components or 'modes' of relational communication are: trust, task orientation, equality, dominance, and formality. We further propose that the trust mode is the central component of relational communication through which instructor behaviors and the remaining student relational communication modal preferences are articulated. Our research model is shown in Fig. 1.

Data from 104 online students in a large southern university were used to test our model. All communication between the instructors and the students were believed to be virtual. Results using PLS analyses indicated that trust was central in mediating the impact of instructor behaviors and relational communication modes of task orientation, equality, and dominance on both subjective performance (perceived learning) and objective performance (course grade). The theoretical, research, and practical implications of our findings are discussed with respect to both virtual communication in general and online communication in particular.

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FIGURE 1: RESEARCH MODEL – RELATIONAL COMMUNICATION, TRUST, AND PERFORMANCE
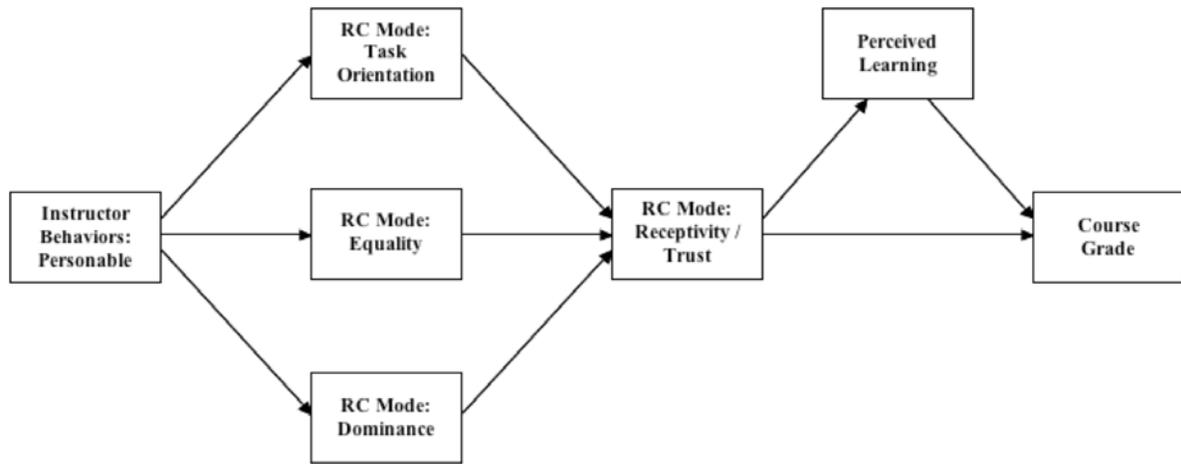
5.5 Beyond Groups and Communities - Social Stratification and the IT User

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Socially-minded research into information systems and organizations has a long tradition of categorizing individuals within groups according to their functional units in the tradition of Lawrence and Lorsch (1967), which is based on assumptions of some uniformity among individuals within a given unit. In recent years, there has been an increasing focus on "communities of practice" (Brown & Duguid 1991; Wenger 1999), which are subgroups within or across functional units that are clustered together based on uniformity of practices and close association. These two methods of stratifying individuals have provided a great deal of useful insight into understanding the local interpretations of new information technologies in relation to the social structures that guide the idiosyncratic responses to and appropriations of those technologies within organizational contexts.

However, organizations are becoming less functionally-oriented with the emergence of alternative forms of organizing and the ubiquity of knowledge work (Yoo et al 2006). Assumptions of group membership and stability are not sufficient in many contexts, as knowledge workers have multiple group affiliations, local environments, unique interactions, and identities (Lamb & Kling 2003). Individuals within organizations have different path-dependent histories and experiences, and the social structures they draw upon to guide their practices are numerous and diverse.

In this essay, we review the body of information systems research that sees individuals as implicated in a socially-structured context, and thus focuses on the nature of those social structures and the way they guide and are reinforced by individual action. We demonstrate that while functional and practice-oriented stratification practices are appropriate and yield rich observations in certain research contexts, they may obscure the multi-dimensionality of organizational life and organizational members' appropriation of technology in other contexts.

To organize our view of the appropriate form of stratification for a given research focus, we leverage Max Weber's (1964) multi-dimensional framework on social stratification. Weber's position was developed largely in response to the work of Karl Marx. Marx stratified individuals by class which is determined by economic position – an argument that essentially states that individuals that share a social location will be cohesive (Gane 2005). This argument is strikingly similar to the common functional stratification of users in information systems literature.

We apply Weber's analysis of class, status, and party in developing a framework of information technology user stratification, and we locate functional and practice-based forms within this framework. Also, we offer four alternative theoretical lenses for stratifying users and propose research situations where each can be fruitfully applied. These alternative theoretical devices include: (1) society's broad institutional logics that guide individual interpretation and action (Friedland & Alford 1991); (2) socio-cognitive social representations through which individuals and groups categorize and make sense of the world (Moscovici 1961); (3) materially-bound object worlds that involve the immediate, artifact-rich technical context of knowledge work (Bucciarelli 1994); and (4) politically charged actor-networks in which individuals are invested (Latour 1986).

5.6 Contemporary Work Practices: On the Dynamics of Control in Technology Mediated Interaction

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Technology mediated interaction has gained significant acceptance and momentum as is evidenced in their massive adoption and varied deployment expressed in the application of ICTs in many organisations for the consummation of contemporary work practices. The growing popularity and application of ICTs such as mobile telephones, Personal Digital Assistants (PDA), videoconferencing devices, BlackBerries and other forms of portable and immovable computing technologies could be accounted for by the concept of the 'disembedded front' (Giddens 1990). By disembedded front, Giddens seeks to identify a situation where the configuration and performance of work is distributed across time and space as a result of organisational imperatives.

Information Communication Technologies (ICTs) play a crucial role in influencing the dynamics of control in technology mediated interaction. Technology mediated interaction may not only engender a reduction in managerial control but also scatter the controlling influence wielded by the top organisational hierarchy that could be instrumental for mutual information exchange, knowledge sharing and work collaboration. A situation that lends support to the observation that emphasis on today's work practices is speedily being shifted from purely centralised to moderately decentralised business processes, partly because of organisational strategising (Malone, 2004).

Organisational scholars biased towards control are so much obsessed with the idea of control that usually lays down the structures for regulating behaviour and setting targets (Ouchi and Maguire 1975). For instance, Thompson (1967) and Reeves and Woodward's (1970) articulation on control reveals a cybernetic process that incorporates testing, measuring, and the provision of feedback against the background of a definite goal scheme. Their concerns happen to reflect the basic tension between strengthening managerial surveillance on the appropriate work behaviour (Eisenhardt, 1985, Foucault 1979) and concurrently aiming to achieve an appreciable level of voluntary conformity.

The above conceptualisation has influenced most researchers to view control mainly as a master-servant relationship; a relationship that exists between superiors and subordinates. Crucially overlooked is the fact that interaction mediated by technology is potentially influencing and changing the dynamics and complexion of organisational control such as the driver and motivation behind control strategies.

Control in technology mediated interaction is crucially necessary for organisations whose operations are not only centrally located but also sometimes transcend their immediate geographic boundaries. An idea clearly brought out by the fact that the pattern of work in such organisations is particularly rife in inadequacy of local knowledge, differences in idiosyncratic experiences, situational priorities, threatening deadlines, risks, disparities in cultural orientations, and variations in values and norms.

Building on Barker's (1993) notion of concertive control, I would advance the argument that organisational control is not static, and that it is revolutionary borne of factors like negotiation process contingent on the media adopted, the particularities of the communicated information and the identity of the initiating party. Again, my analysis on control would reflect the fact that the concept is not only about the predetermination of targets that find their attainment at the subordinate level. Indeed control should not be regarded as a one sided concept and that subordinates are sometimes the drivers and initiators behind certain control techniques in the administration of an organisation. Using the theory of control and depending on the philosophical hermeneutics for a rigorous data interpretation, this study seeks to develop both an innovative and holistic conceptualisation of control and in the process extend its current organisational understanding in the context of technology mediated interaction.

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6.1 Enabling Agility in Existing Information Systems: A Control Structure for the IT Complement

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The research topic is the agility of existing information systems. The concept of agility is explored in the IS research literature and recent practitioner surveys. Practitioners are subscribing to a common message of agility which consists of: recognition of a business environment that fluctuates quicker than conventional strategic planning cycles; the need to sense environmental fluctuations; the need to respond with options using existing information systems; and organizational readiness to effect the sensing and response. The research proposes that the IT complement's control over an existing information system is a determinant for agility. The IT complement is those IT people and their processes responsible for an information system, and can be considered the complement to the technology just as a ship's crew is the complement to the vessel. While the type of technology used in an information system is a likely determinant of agility, it is not the focus of this research. We examine how the IT complement can control the existing information systems for emerging opportunities. The research will inform practitioners on the agility of an existing information system, and assist in making decisions to invest further resources into the IT complement.

Control is the monitoring of perturbations in the environment of a system, and adaptations of a system in response to those perturbations. A control structure for the IT complement is deduced from Stafford Beer's Viable System Model (VSM). Parallels are drawn with established concepts of agility in information systems and those of management cybernetics. The VSM is a well-established theoretical framework of cybernetics, which proposes that any viable system has five necessary and sufficient subsystems involved in maintaining its identity within a fluctuating environment.

The research design will use three modes of investigation. Firstly, a conceptual test of the applicability of the VSM to the basic model of agility in existing information systems will be undertaken. The test will be achieved by a deductive approach to empirical generalizations of IS industry practice, and determining whether the generalizations fit the substantive theory of using VSM in existing information systems. The claimed industry best practice to be used is COBIT. A product of the conceptual work will be a set of hypotheses.

Secondly, the research will survey case studies previously published in IS literature to test the plausibility of the hypotheses from the conceptual test. The case studies must have a focus on an existing information system, have sufficient detail of the IT complement involvement, and have an agility outcome.

Finally, the research will conduct a case study of approximately five organizations to test the plausibility of the hypotheses against claimed industry best practice. The case studies will consist of quantitative measurement of COBIT maturity and semi-structured interviews to determine any agility outcomes. The selection criteria for organizations are: the implementation of COBIT with varying levels of maturity; the presence of existing information systems for conducting business processes; and the co-existence of a COBIT level of maturity and the focal information system of more than one year.

6.2 Public Safety Networks - Understanding the Mechanisms of Diffusion in a Highly Interdependent Context

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Traditional research on the diffusion and adoption of innovations has focused largely on a single individual adopting an innovation. Rogers' (2003) classic diffusion of innovation theory was and is a powerful tool for explaining "*simpler* innovations being adopted *autonomously* by *individuals*" (Fichman, 2000, italics in the original). Much research has been done to modify the original model to develop new frameworks for individual adoption as well as expand it to include individual organizations. But what is to be done in a more interdependent context?

As a research associate on a NSF-funded project with professors Lynne Markus, Jane Fedorowicz, and Christine Williams at Bentley College and Steve Sawyer at Penn State, I am studying what we call public safety networks (PSNs). PSNs are essentially an interdependent IT-enabled organizational form for public safety-related inter-agency collaboration and information sharing. The current focus of the research is on what makes PSNs successful. What I am also beginning to think about is how and why these PSNs form in the first place – how this particular innovation is diffused and adopted. A review of the literature has shown a gap in the area of highly interdependent innovation contexts. To better illustrate, understand and ultimately fill this gap, I hope to develop a framework for understanding the levels of interdependence as well as the mechanisms of diffusion in this particular highly interdependent context.

A useful first step towards such a framework is a better articulation of the levels of interdependence. I suggest three levels of interdependence. At the first level, the individual level, the organization can essentially say, it would be great if other firms adopt this innovation but it really doesn't matter if they do. At this individual level, few, if any benefits, accrue because of other organizations' adopting. One possible example is total quality management (TQM).

The next two levels are adapted from Thompson's (1967) seminal book, *Organizations in Action* where he discusses levels of interdependence within organizations and labels these 'higher' levels as pooled and reciprocal interdependence. In pooled interdependence an organization can adopt the innovation and potentially see some benefit but in order to get the maximum benefit from the adoption other organizations need to also adopt. A possible example is service oriented architecture (SOA) which may be useful on its own for the organization but where greater adoption leads to, for example, a larger number of vendors promoting and training SOA solutions which leads to a greater pool of employees familiar with and able to effectively work with SOA.

At the third level of interdependence, reciprocal interdependence, an organization needs other organizations to adopt to see any tangible benefits. One example is electronic data interchange (EDI). Another example is a public safety network in which the success of the network depends on the adoption of the innovation by several organizations.

The next step is to understand the mechanisms of diffusion occurring at each level of interdependence. Rational choice is likely only operating for the first individual/organization. After that, I argue it is some form of institutional pressure, which will vary depending on the level of interdependence.

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6.3 Seeking Countermeasures for Information Systems Project Risk

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Schmidt et al. (2001) uncovered an extensive list of 53 potential risks to information systems (IS) projects. They proposed that further research should be conducted to examine specific strategies for mitigating these risks. A high-level view of the types of countermeasures that are successfully employed was described by Barki et al. (2001). The countermeasures were classified into three broad categories: internal integration, user participation, and formal planning. They found that emphases on each of the three categories varied between high-risk and low-risk projects.

The work of Barki et al., is valuable in that it helps us understand how risk management can be conducted in general terms, but the question of which specific measures in each category are more effective is not answered. In the current research project, the specific countermeasures that project managers have found to be successful are examined. The intent is to improve our knowledge of risk management at a higher level of detail than the (necessarily) more abstract level of the Barki et al. study. Project managers at ten large firms were interviewed to obtain their approaches to handling the "top 11" project risks as described in Schmidt et al. The interviewees were asked both structured and unstructured questions about their management experiences and philosophy, followed by intensive questioning concerning their strategies for mitigating the 11 project risk factors, both in sum across their career, and in the context of a specific project.

Analysis of the interviews is currently underway. Early indications are that the more popular countermeasures fall within the three broad categories used in Barki et al. However, some of the strategies described by the interviewees have unique twists that make them more effective both in terms of the project at hand and in terms of the long-term political relationship between the IS department and the other functional areas of the firms. This study makes an important contribution to our knowledge of software project risk management by moving down the level of abstraction ladder to examine specific strategies for mitigating risk.

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6.4 An Information Systems Design Theory for Integrated Requirements and Release Management Systems

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The development of high technology products is characterized by pressures towards shorter time-to-markets, increasing complexity of product designs, globalization of markets, and continuous price erosion. To succeed, high-tech companies need to shorten the cycle time of new product development (NPD) while improving product quality and maintaining or reducing the total resources required. Their abilities to meet these business goals depend on how extensively and effectively they collect, analyze, and utilize requirements in their product development. This is particularly true during the earliest phases of NPD in which different functions – marketing and R&D in particular – within and across organizations need to integrate their knowledge into a product concept that provides direction for the internal personnel and the external service providers during the downstream phases of NPD.

Yet, the achievement of such integration is complicated by several factors. The development activities are scattered across multiple sites and organizations, which limits possibilities for setting up face-to-face meetings. Moreover, differences in organizational cultures and divergent perceptions about the product's mission may make it difficult to reach an agreement about how the prospective product should be defined. Communication, coordination, and collaboration support for the early phases of NPD activities poses a significant challenge with substantial payoffs.

Salo and Käkölä (2005) found that (1) RMS groupware-based requirements management systems (RMS) need to be designed and used to redesign and enact the earliest phases of product development effectively in multi-site, cross-functional NPD organizations and that (2) the extant scientific literature does not provide adequate support for designing and deploying RMS. They developed an information systems design theory for RMS in order (1) to facilitate endogenous theory development in the context of RMS research, (2) to help RMS designers build successful RM systems, and (3) to guide organizations in evaluating and deploying RMS.

However, Salo and Käkölä (2005) found also that the benefits afforded by RMS were hampered if the RMS instances prescribed by the design theory were not integrated with systems used in the downstream phases of NPD in order to provide transparent end-to-end support throughout the product lifecycle. The scope of the ISDT should thus be broadened to design systems that support the lifecycle more comprehensively.

This research focuses on integrating requirements management with release management. Release management is concerned with the identification, packaging, and delivery of product's elements. It essentially mirrors requirements management in the other end of the NPD lifecycle ensuring that internal and external product releases meet the (specified and managed subset of) requirements identified in the front end of NPD and agreed upon during release planning and product line roadmapping. Based on our extensive industrial experience and review of pertinent academic literature concerning these two key processes, we hypothesize that the theoretical validity and practical relevance of the ISDT for RMS can be enhanced most effectively by extending the ISDT to provide integrated support for both requirements and release management.

Release planning must be conducted carefully and systematically and the release plans must be communicated to the downstream phases and to the external service providers clearly and in time. Otherwise, it is very difficult for the providers to schedule and synchronize their production activities to meet the requirements specified in the release plans. For example, requirements are unlikely to be measurable and the functional sizes of software releases cannot be estimated using functional size

measurement if the requirements are not even linked to releases implementing them. The available literature provides little guidance for designing and deploying such integrated Requirements and Release Management systems.

The goal of this research project is to develop an ISDT for the class of Requirements and Release Management Systems (RRMS). Preliminary meta-requirements of the ISDT have already been created based on a literature review in the areas of requirements management, release management, and process integration. A preliminary meta-design of the ISDT has been created that partially meets the meta-requirements. The validation of both the meta-requirements and the meta-design has been initiated by conducting a single case study in a global high-tech corporation. The results of the case study are promising. The meta-requirements have been found correct and useful in practice but incomplete. New meta-requirements thus need to be introduced in the ISDT in order to make it more comprehensive. The partial meta-design has also been found useful for guiding the design and deployment of RRMS instances in practice. However, the meta-design has to be made more comprehensive to fully meet the meta-requirements.

6.5 Interpreting IT Implementation Initiatives in an Organization: A Cultural Perspective

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Organizational cultural aspects are critical for successful IT implementation. Although various researchers have used culture to study IT implementation this area is still under-researched. There have been limited efforts to investigate IT implementation using a theoretical framework which approaches culture as a set of shared communication patterns. Failure to comprehend culturally ingrained processes would be detrimental for any organization. In order to conduct culturally grounded analysis, it makes sense to employ a theory which is based on the underlying assumptions of the reference discipline, anthropology. In this research paper, we use cultural theory of silent messages to identify aspects of organizational culture that would have an impact on the implementation process. This theory considers culture to be facilitating mutual understanding, which can only be understood in terms of many subtle and silent messages. This means that culturally determined patterns of behavior are messages that can be communicated. The research paper argues the importance of analyzing the underlying silent messages, which are patterns of behavior, in an organization for successful IT implementation. The culturally grounded principles would imbibe the explicit and implicit rules or standards deemed acceptable by the organizational members. As such, the cultural intent of an organization is the key to successful IT implementation.

The research study follows an interpretive case study approach to develop theoretically rigorous principles. The empirical data collection involves analysis of two case studies in different organizational setting. We use the taxonomy of behavioral patterns from theory to interpret the change in attitudes of different stakeholder groups with the implementation of computer based system in an organization. As per the theoretical framework, there are ten different cultural streams which interact with each other to produce 100 different cultural settings. By studying the matrix of these cultural streams we can perform a "Cultural Analysis" for each of our initial two case studies. That is, the analysis is done by considering the actions within each cultural stream and their significance in other cultural areas of the organization. This framework helps in interpreting the cultural consequences of IT implementation that are likely to cause trouble if not perceived in time. The culture map analysis allows interpreting management implications for significant culture streams in each case. These general management implications allow the development of principles for successful implementation of IT projects. The principles so developed would indeed reflect the deep-seated cultural intent of an organization.

6.6 Coercive and Non Coercive Power(s) in IS Projects: A Tunisian Case Study

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This study is focused on interpersonal power conflicts which are an important, but sometimes neglected, topic in Information Systems Development (ISD). The authors use a qualitative approach, based on a Tunisian case study, to explore the relationship between the exercise of power and the success or failure of an IS project. The present study is conducted in a Tunisian chemical firm in order to explain the failure of a support application (back-office) developed, tested, improved and implemented by their own competencies.

The authors show that manipulating possessed knowledge is the main source of power exerted (or not exerted) by IS users (end users), IS professionals (key users, developers and conceptors) and Top management in order to influence the process of decision making. We use Crozier and Friedberg's approach underlining four "uncertainty zones" as power or argumentation sources: expertise, controlling relations with the environment, communication and manipulating organizational rules.

Furthermore, we perceive a significant difference between powers exerted by each stakeholder all along the decision process. Finally a dichotomy of coercive (# hierarchical) and non coercive (# influence) forms of power emerged throughout this study. The improper use of coercive and (probably much more) non coercive power may cause or/and exacerbate conflict to the point where cooperation becomes dysfunctional.

Stakeholders' power sources

Stakeholder	Sources of power/ argumentations
IS professionals	Their power stems especially from their knowledge, their experience/expertise and their ability to communicate. *"Its manner to communicate, to organize its ideas, to present and structure its phrases, allows him to convince his collaborators.. He has a good theatrical knowledge and experience and he is able to communicate with everyone without exception…"*
IS Users	Users' power results from three sources: • **Informal relationships**: *"They had a direct access to Top management which increases their power (…) Moreover, the main goal of Top management is to provide for users an application which satisfies their needs. This fact may intensify their weight (importance)."* • **Information in possession**: *"Users were aware that Top management looks after their satisfaction. This application was developed specially for users in order to help them in their work. If they were not satisfied, they will not put it in use. For the present time, they will drop it. This fact will not be accepted by top management particularly after spending all these amounts."* • **Users' system-related functional expertise**: **"***Users hold some knowledge which is called "functional expertise". This knowledge is derived from their experience (…) Organization seems like a kitchen; we may have the same recipes but differ in the cooking skills. Why this difference? It is attributed to experience. For example, your mother may give you a recipe with all details, but when you cook it, its taste will not be the same …"*
Top management	Top management has the power to make decisions regarding policy questions and impose conformity to its directives. In this project, we noticed that Top management did not play its role suitably : *"It was necessary that top management give us a hand (…) A daily and permanent audit must be done by manager's office. This audit did not occur…"*

Stakeholders' power relationship and their effect on IS project

Our results are summarized in the following figure showing that 1) project success needs, at least, the exercise of power simultaneously by Computer scientist and Top management and that 2) IS users, sometimes, refuse to cooperate leading to the complete failure of project.
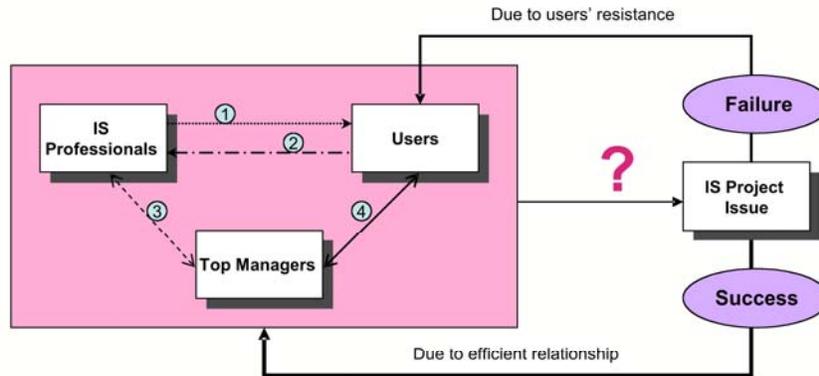
(1) IS Professionals try to involve Users

(2) Users refuse to share and cooper

(3) Hierarchical relationship

(4) Informal relationship

7.1 A Framework for Informed Off-Shoring Decisions

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Heretofore labor arbitrage has dominated the IS off-shoring decision. However, such a structure is unsustainable in the long term. This paper examines a number of societal and technological structures that also interact in the situation. It is argued that by understanding the change directions in these structures, which are described below, those who operate within them, are empowered to make informed decisions about their situations.

Firstly, certain, but not all, cultural roots can be seen to have had significant effect. A degree of commonality of language and culture can be seen as a facilitating factor. The degree of élan in English has been a major factor in allowing Indian companies to grow in the UK and US markets. Further, as the education systems of these countries have common roots then the business expectations amongst the actors are facilitated.

Secondly, the emergence of quality assurance frameworks that are meeting with significant acceptance in the demander communities has empowered provider organizations to claim that the processes that they enact lead to quality systems.

Thirdly, there is the constantly changing technology. As the technology has evolved through at least four generations, the educators of skilled individuals adept at developing the artifacts of the technology have been challenged. It is arguable that in different educational systems there have been different emphases and to some extent the longer established educational systems have sought to sensitize students to wider, "softer" and more management oriented issues than education systems in the Newly Industrializing Countries. Whether this has created a credibility gap for graduates from the Long Industrialized Countries is a question that needs to be explored.

A fourth significant set of structures has been the liberalization of international trade and the organizational forms adopted by multinational and exporting/importing organizations. With some dynamic economies opening up to free flows of knowledgeable workers, complex problems are created on both sides of the off-shore provision which are beginning to lead to complex reconfigurations.

A fifth structure is the propensity for technologies to descend a staircase of Newly Industrializing Countries due to labor arbitrage and the propensity of economically active countries to leave behind low cost activities. This phenomenon has been observed in other industries e.g. textiles and garments.

It is believed that a multi-dimensional framework such as outlined will serve to inform those in both the provider and user communities of the off-shoring scenario. It will also be of interest to organizations in prospective provider economies as well as those seeking new long term partnerships in demander economies. Currently there is a PhD project within this framework and it is anticipated that others will seek to explore the various structures identified.

7.2 International Issues in Information Technology Outsourcing: A Categorical Analysis

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Information Technology Outsourcing has been recognized as a worldwide IT trend and an undeniable trend since Eastman Kodak signed total outsourcing agreements with three large external IS providers (Lacity, 2002). IT outsourcing is seen as a worldwide trend. The Gartner Group indicated a 16.3 per cent global growth rate between 1997 and 2002 (Khalfan, 2003), by reaching US$120 billion in IT outsourcing in 2002, with a US$51 billion share for the United States. The current global IT outsourcing market is estimated to be around US$500 billion (Lacity, 2002). Outsourcing deals include organizations such as British Aerospace, British Petroleum, South Australian Government, Swiss Bank and the Commonwealth Bank of Australia (Hirschheim & Lacity, 2000). In addition, the IT outsourcing Asian pacific market will grow from US$8.97 billion in 2002 to US$4.9 billion by 2006, with a compound annual growth rate of 21 per cent. Large firms, such as the Singapore giant banking leader ABN-Amro invested heavily in IT outsourcing practices. The Arab countries are also facing a serious concern towards IT outsourcing. A recent report (MENAFN Research, 2003) showed that leading retail Arab banks have started to outsource commodity-like IT functions and are seriously analyzing the possibility to outsource more complex and large-scale IT domains such as networking and Telecommunications. The report indicated that around 40 per cent of the surveyed companies have increased their IT outsourcing budget in 2003, whereas 30 per cent will maintain their 2002 previous budget.

Research on the topic on the topic of IT outsourcing has shown the importance of this phenomenon and its associated trends, challenges, risks and benefits. However, most of IT outsourcing research was conducted in North America. In this study, we argue that research, in general, is socially constructed and constrained by the context within which it is performed. Hence, there is a need to examine IT outsourcing in different geographical locations to validate similar findings taking into consideration the local specificities. This study intends to examine IT outsourcing research in different countries and regions and provides insights on the differences in issues, concerns and approaches. A categorical analysis was performed on a set of recent research studies on IT outsourcing. The findings show that, indeed, there are differences among different regions regarding IT outsourcing practices including the decision criteria, scope, contract design and relationship management. In addition, results show that environmental factors such as political and cultural issues have to be taken into consideration in order to understand IT outsourcing practices and predict its success in a particular country or a region. Implications for both researchers and practitioners are also discussed.

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7.3 Ethical IT Outsourcing – Do Social Costs Matter?

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Hypothesis

Corporations must continually reduce costs and improve processes in a globally competitive market environment. Outsourcing provides an avenue to accomplish this goal. However, outsourcing and offshoring are emotional topics in IT and IT enabled outsourcing, especially for those who would be displaced. The costs to society (both local and global) of outsourcing may outweigh the benefits to the corporations and their shareholders.

A rising wave of corporate social responsibility (CSR) has encouraged corporations to examine all implications of their business decisions. Business executives and boards will examine outsourcing and offshoring in terms of social implications in addition to traditional business benefits. Social implications include the welfare of the general populace where the corporation operates as well as the welfare of the populace where the IT and IT enabled services will be outsourced to. Specifically, corporations who outsource will want to ensure that their providers can attest to the well being of their employees and the communities in which they operate.

The CSR trend is already apparent in manufacturing, especially in the clothing industry. This research will focus on white-collar outsourcing and offshoring, of IT and IT enabled services.

The rising acceptance of CSR suggests that outsource service providers will position themselves as ethical outsourcers with a strong social conscience.

Structure of research

Is IT outsourcing a generally accepted business practice and perhaps inevitable for most organizations? In early part of this decade Offshoring was seen as 'treason', by politicians and labour representatives, yet today, it is an accepted business practice: why has this changed?

What are the social costs of outsourcing and Offshoring?
- Displacement of local workers
- Difficult for new workers to start careers as entry level jobs are moved offshore
- Offshore workers are under pressure to constantly improve and keep costs low
- Today's low-cost offshore locale will be challenged by the next global low-cost locale

What are the concerns that corporations may have regarding the social cost of outsourcing and Offshoring?
- Corporate social responsibility recognized as important component – triple bottom line – of a company's role in society
- Could IT outsourcing be used to distribute wealth in developing countries?

Research approach

The research will use interview and survey data to develop an understanding of the importance of CSR in making an outsourcing decision. The research will look at both those who make decisions to outsource and those who provide outsource services. We expect to find both parties will attest to the importance of CSR. The survey and interviews will look for evidence that CSR issues do make a difference, and what those differences may be, in awarding and executing outsource contracts. The research will be largely qualitative.

In this research we plan to:
- Interview large corporations that have outsourced IT and ITES
- Survey small/ medium enterprises that have outsourced IT and ITES
- To understand how outsource suppliers position their services
- Interview North American outsourcers, who provide global IT and ITES services
- Interview India outsourcers who provide services to North America organizations.
- Interview outsource advisors such as lawyers, consultants and academics.

7.4 The Outsourcing I-Space: Knowledge Management Across Global Boundaries

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In theory, any activity that is not tied to a particular location can be performed at a distant location, i.e. "outsourced". Since Kodak's 1989 deal that shook the corporate world, IT outsourcing is inevitably the next step in globalization that calls for far more attention than simple "fee-for-contract" issues commonly discussed in the literature.

One such issue is how and why knowledge, which is increasingly being considered as the primary source of wealth in today's post-industrial society, can and should be effectively managed in strategic offshoring contracts. The wide research gap between theory and practice is due to the high complexity and lack of established theories in this field.

Theoretical concepts based on the emerging knowledge based view of the firm are integrated with the three-dimensional Information-Space model that explains information flows (Boisot, 1998) and the outsourcing literature to identify complex, covert workings of underlying processes in the knowledge dimension of outsourcing.

Boisot's Information Space model provides a rich, theoretical lens that is used to explain information and knowledge emergence, diffusion and use within and across outsourcing organizations. This orchestrates an iterative social learning curve across organizational settings that goes beyond formal structures and is continually being shaped by the types of actions performed. Further, the heterogeneity and complexity of knowledge-based resources allows it to be a major determinant of sustained competitive advantage in outsourcing organisations.

A pilot study at a leading Dutch organization looking to contract-out part of its IT division was conducted to identify key issues that had been largely overlooked, and had led the organisation to eventually take back its decision to outsource.

During the pre-outsourcing phase, this client organisation found itself caught in a dilemma. In the negotiations stage, the supplier company had put up a "Request for Information" in an attempt to conduct a feasibility check before entering a formal outsourcing agreement with the client company. Unfortunately, the client found itself faced with the inability to provide the vendor with the requested, explicit information and knowledge!

Knowledge is generally shared and embedded through formal multiple entities e.g. documents, systems, organizational culture, identity, routines, practices etc. Preliminary findings from the pilot study, however, indicate that this does not always suffice. That is, even though these orderly patterns, coded schemas and structures in information use, e.g. in the form of a KMS cannot be undermined, in reality these objectivist methods need to be complemented with more humanistic, subjectivist approaches.

The tight inter-reliance and dependency between the client and vendor across outsourcing organizations requires that they identify or be constantly aware of each other's needs and requirements. This interaction allows them to make sense of changes and developments in their external environments, construct meaning through information and knowledge sharing, and reach workable decisions.

Results drawn from this pilot study lead to the formulation of a hypothesis that it is an integrated approach which involves both the objectivist and subjectivist stance in collaborative effort(s) to effectively manage knowledge across global boundaries that is a key determinant of the success of an outsourcing project.

I intend to test the above hypothesis and key constructs identified in this pilot study through an ongoing outsourcing project between a Dutch-based MNC and a leading service provider based offshore. Evidence drawn from this second case study would be used to construct an Outsourcing I-space Model that would further explain underlying dynamics and enable generalizations that have wider practical applications in the field of outsourcing.

7.5 Closing the Market: A Side-Effect of an Efficient E-Marketplace

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The make-or-buy dilemma has been widely analyzed in the IS field. The reason why the literature on this subject is so prolific is because information technology (IT) allows the physical separation of different activities and also because the IT function itself was one of the first business areas to be outsourced constituting a multi-billion dollar business (Tettelbach, 2000).

While only a few marginal business activities were initially outsourced for the sole purpose of improving efficiency and controlling costs (Ciborra, 1993), in the nineties most organizations started to outsourcing entire "core" company functions, including in some instances core-business processes (Willcocks and Lacity, 2001).

Among the many processes that can be outsourced the most classic ones include salary management, pension funds management, and tax filing. More recently companies have experimented with various degrees of outsourcing arriving at extremes like Nike that only had marketing in house or the more exotic Koenigsegg Automotive that while making custom made cars only owns a hangar and employs 30 people.

These two companies show that among the many business processes that can be outsourced it is interesting to look at the procurement process due to the strategic role that it plays in the value chain. Since the early nineties, in fact, the environment in which companies across all industries have worked has been characterized by a fast-paced globalization process with new emerging markets and competitors and increasing expectations from customers. In the manufacturing industry for example the access to certified quality and production inputs requires extremely complex information systems to satisfy today's procurement process needs.

The emergence of the internet as a global infrastructure for electronic exchanges has further increased the outsourcing services. New players – known as electronic marketplaces – entered the scene as the mediators of virtually any transaction. Covisint.com, for example, represents an emblematic case of strategic use of the internet in order to manage and control the relationship among many actors involved in the automotive industry value chain. The main aim of e-marketplaces was to leverage the IT infrastructure to put in contact a large number of suppliers and buyers. The business model was to decrease buyers' and suppliers' transaction costs while charging a fee for the service.

While much has been written on marketplace's technologies and functionalities and on their relations to the member companies, little has been written on the role that marketplaces have in the shaping of the behavior of the member organizations among themselves. In particular the inter-organizational behavior has never been studied longitudinally as the services provided by the marketplaces evolve over time.
The focus of this research is on the way in which electronic intermediaries affect - through their evolving services and supporting technologies - the governance structure among the actors involved in the value chain. Specifically this paper investigates the role played by IT-supported marketplaces in shifting the organizational boundaries and behaviors of companies in the continuum between hierarchically or market-based governance structures (Powell, 1990).

Electronic marketplaces – as mediators among business partners – re-design the procurement process and generate new collaborative dynamics among participants. Marketplace members, following a drifting trajectory, begin to privilege a new form of coordination, the close market, which is surprisingly preferred to the access to the entire market – which is normally the reason to become member of a marketplace. A case study of an e-marketplace in the food industry, analyzed from the point of view of the marketplace, suggests that as more complex services are proposed the participants begin to prefer an exclusive access

to the technology and to the network. The technology furnished by the marketplace is seen as a source of strategic advantage and therefore its accessibility has to be protected. While profiting from this unintended consequence, the e-marketplace changes its role from being an agent who levels the access to becoming the involuntary instrument of gate keeping.

This paper will be structured in the following way: first the theoretical discourse on electronic intermediation is presented, then we present the research method and research site. Finally the analysis and the discussion are presented.

7.6 The Role of Boundary Objects in Collaborative Conflict

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In recent years systems development outsourcing projects have become increasingly popular amongst organizations wishing to enhance their information technology capabilities. Such projects are typically distributed in nature: the knowledge, resources, and expertise that are required for the development process are dispersed across multiple organizations that come from diverse social and technological backgrounds, which need to collaborate to achieve mutual goals. They do so by communicating through the use of a variety of shared artifacts such as contracts, requirements specification documents, and models of the developed system, which act as boundary objects.

Boundary objects are conceptual or physical artifacts which reside in the interface between organizations and are used by them to engage in joint practices. On the one hand boundary objects are flexible enough to contain multiple meanings which arise from the different organizations that use them. On the other hand, their structure is solid enough to serve as a common reference point to members of the organizations that use them. On account of this quality, boundary objects can bridge perceptual and practical differences between diverse organizations when they engage in joint practices, by facilitating common understandings and effective cooperation (Star & Griesemer, 1989; Henderson, 1991; Karsten et. al, 2001).

Most existing research utilizing the concept of boundary objects has evaluated their quality in terms of project success, and the bringing together of collaborating parties in a positive and constructive set of relationships (e.g., Bechky, 2003; Carlile, 1997; Sasped & Salter, 2004). The quality of the boundary objects is the extent to which the outcomes of their joint effort are deemed satisfactory by the collaborating parties. In cases where such collaborative outcomes were not reached, boundary objects were said to have failed (e.g., D'Adderio, 2004; Sasped & Salter, 2004).

In our work, we suggest that boundary objects are also "productive" during inter-organizational conflict. We argue that conflictual inter-organizational relationships depend upon the "effective" use and intrusion of boundary objects between the parties. We suggest that the boundary objects are effective in this case because they facilitate and sustain ongoing multi-party conversations – the sharing of opinions, worldviews, and information – whether cooperative or conflictual. To demonstrate this, we will present data from several case studies of systems development outsourcing projects, which by all measures, have failed: the development of the desired system was not completed on time or on budget, and the parties are involved in various legal disputes with each other. These inter-organizational relationships are characterized by mutual lack of trust, suspicion, and animosity.

Despite this, we will demonstrate that the disputes between the parties were fueled by a significant joint effort by the participating organizations, which involved an engagement with the other party through the development and deployment of shared artifacts to mediate inter-party conflict – in this case, contracts, system design artifacts, and other boundary objects. In this case, the flexible interpretation of boundary objects, to contain multiple meanings, and a solid structure in providing a common reference point, stabilize the conflictual and legal engagements. Based on these findings we draw implications for the study of boundary objects as well as for understanding the nature of systems development outsourcing conflict.

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8.1 'Representation' in System Development

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User participation in the information systems development process has been an important area of study for many years. User participation or involvement is said to build user buy-in for a new information system, is thought to enable stronger information gathering about user needs and wants, and is argued to lead to better user-developer relationships (Markus & Mao, 2004). Some have argued, as well, that user participation is a right that should be given to those whose work lives would be affected by a new system (Hirschheim and Newman, 1991). Despite these arguments for user participation, the link between it and system success remains tenuous (Howcroft and Wilson, 2003). Seeking a deeper understanding of user participation, therefore, remains an important goal.

Drawing upon Jürgen Habermas' Theory of Communicative Action (1983, 1987), it becomes clear that achieving the goals of user participation requires careful attention to the question of who participates in the process and how this participation is structured. Surprisingly little research has been directed at these questions. However, today's information systems development projects are more likely to span the entire organization, affecting many more organizational stakeholders. This makes it increasingly difficult to allow broad-based participation of those who will be affected by the system. It is in this context that "systems of representation" are put in to place to structure user participation.

This presentation reports on a critical ethnography within a health care organization in which two information systems were being implemented. These information systems were part of an overall Electronic Health Records project and were intended to integrate patient information, both within and across hospital sites. Participation and representation emerged as key issues in this setting. Clinician participation was considered critical to the success of the projects and structured through a system of representation. However, close scrutiny of this particular system of representation begs the question – "how is 'representation' produced in organizations, and how does this pre-configure and constrain system development processes?" This presentation examines these questions and, drawing upon this examination, considers how user participation might be structured so that it is more in keeping with Habermas' Theory of Communicative Action.

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8.2 The Reflective Design Environment

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The Theory of Tailorable Technologies Design (Germonprez et al., 2007) proposes two environments in which the designer and the end-user create and recreate information systems. In the theory, two environments are presented as necessary for supporting tailorable technology. One of these environments, the reflective environment, supports the users' thinking and reflection on how an information technology could be tailored to better match ad hoc use patterns, metaphors, tasks, and sense of aesthetics. As a result, the theory treats design as phenomenological, and focuses on a value-free approach to user-technology interaction and avoids the reduction of the error term of traditional IS outcomes, such as satisfaction, performance, and efficiency. To do so, the reflective environment distinguishes between design and the ways of doing design and requires that attention be paid to the different experiences, perceptions, intentions, and goals that the user will use to recreate the design of the IS. It also aims to create a phenomenological potential for action in which the user tailors the information system and develops uses in new contexts or for new tasks (Germonprez et al., 2007). Thus the focus for design and research moves away from approaches that seek to identify variables that decrease error of standard performance measures. Our approach also moves away from a dominant approach in systems design to over-engineer the IT artifact through a restricted set of data structures, interfaces and reporting systems, so that a limited range of work practices are allowed. By standardizing information gathering and presentation, many approaches produce and re-produce error by restricting the ability of users to reflexively and skillfully adjust their practices and computing systems to support changing goals, use patterns, and tasks. Given the increased interest in adaptability and system agility, traditional requirements analysis is fraught with risks beyond incomplete specifications, limited time, and restricted participation, and may result in a freezing and restriction of organizational practices to an increasingly irrelevant past. Instead, the reflective environment in the Theory of Tailorable Technology proposes design principles that encourage tailoring the information system as an end in itself. This requires support of classes of tasks, use patterns, recognizable conventions and components, and metaphors that the end user may encounter during use. Whether the reflective interaction between the end user and the principles in the reflective environment achieve "better" outcomes is a viable, yet secondary question. Indeed, the popular concept of ubiquitous computing embodies the provision of seamless access to a variety of services for a variety of tasks, where outcomes are not predefined but instead emerge, in a continuing process of on-going, contextualized interaction (Weiser, 1993). Thus, it is more important than ever to understand the value-free design and use processes by which technology is applied and tailored.

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8.3 The Notion of 'Emergence' as a Linguistic Construct for Eliciting Security Requirements in ISD

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This paper addresses a persistent problem in the design of information systems: how does a design team create a useful set of requirements in dynamic organizational settings? In IS literature the term "emergence" has been informally used in describing organizational contexts and the process of ISD itself. [Markus and Robey, 1988, Orlikowski, 1996, Pfeffer and Leblebici, 1977]. Truex and coauthors [Truex and Baskerville, 1998, Truex et al., 1999, Truex et al., 2000] formally incorporate a theory of emergence in the discourse on IS development methods. They liken the process of ISD to a linguistic system in which the 'grammars' of method must be emergent. However, they stop short of developing a full epistemology of the notion and provide little more than analogical and descriptive examples grounded in linguist Paul Hopper's Emergent Grammar Hypothesis (1987). Hopper's thesis rejects mainstream notions of structural linguistics, in which grammar, as a set of rules and constraints associated with language, exists independently of the speaker and prior to, language use itself, in favor of grammar as a "real-time social phenomenon" that "like culture, is 'temporal, emergent, and disputed'". (Clifford, cited by [Hopper, 1987])

The incomplete development of the epistemology and an ontology of the emergence construct has proven problematic for scholars attempting to apply emergence theory in practice [Bello et al., 2002]; for, while researchers or practitioners might find the idea of emergent organizations inviting, without a clearer notion of the characteristics and mechanisms that define and enforce emergence, the concept is difficult to use in the practice or study of ISD. Accordingly, this paper seeks to contribute to the development of a theory of emergence. In pursuing this goal we have examined how the concept of 'emergence' has been described in fields as diverse as mathematics, biology, physics, sociology, philosophy, socio-linguistics and organizational studies.

For the purposes of this paper we are drawing on current work in the sub-disciplines of organizational studies (organizational communication and organizational discourse) and post-structural linguistics, wherein theorists have advanced the discourse on the nature of organization as an emergent phenomenon [Fairhurst, 2004, Heracleous and Barrett, 2001, Taylor and Robichaud, 2004, Taylor and Van Every, 2000]. Organizational communication and discourse studies explore organization as a discursive construction; the very foundation on which 'organization' is built. In linguistics, Hopper's work, while independently developed, has strong conceptual connections with Derrida's notions of indeterminacy [Weber, 1997], Giddens' theories of the interaction of agency and structure as mutually informing [Heracleous and Barrett, 2001, Taylor and Van Every, 2000], and Weick's concepts of enactment and loose coupling [Taylor and Van Every, 2000]. Following these separate, but converging, lines of inquiry we re-conceptualize the organizational contexts in which IS requirements elicitation occurs. That is, as seen and constituted through interactively generated text-worlds, enabled and influenced by narrative-mediated conversations, all recursively regenerated in collective action and/or discursive fragmentation and conflict. Using this meta-theoretical lens we then explore how emergence is manifest or arises through an examination of texts focused on IS security requirements for a State government.

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8.4 A Multi-Paradigmatic Approach

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The research was ontological with a practical focus and sought to contribute to an understanding of how agricultural decision support systems (DSS) entered into women's roles as farm partners on Australian family cotton farms. The case study focused on Australian women cotton growers on family farms in the Australian states of south east Queensland and northern New South Wales. Data collection was predominantly through semi-structured interviews with 32 participants during one pilot study, two main field studies as well as telephone interviews, over a period of three years. The participants were cotton growers, and cotton industry professionals, such as DSS developers, rural extension officers, researchers and educators, rural experimental scientists, and agronomists and consultants, all of whom advise cotton growers.

At a recent Australian information systems conference, as first author, I presented a paper which reflected on the development and use of the pluralist research approach in the study. The authors had initially approached the study from an exclusively interpretivist perspective, viewing women's use of DSS and their roles in cotton farm management as socially constructed. However, the farm women's perceptions of the DSS as immutable, the need for cotton growers to accommodate their practices to industry targets to gain maximum benefit, and the insistence by the women that they were team members alongside their farm partners, prompted both authors to consider whether more than one research approach might be necessary to understand this complex problem. As a consequence, the main theories adopted to inform the study were structuration theory by Giddens (1984), diffusion theory by Rogers (1995), and gender relations theory by Connell (2002). Since these theories are based on opposing paradigmatic assumptions, the paper considered the problem of incommensurability between paradigms in information systems research and the possible role of structuration theory in overcoming the objective-subjective dualism.

Although the authors are sensitive to issues of research rigour, the main concern of the study was in providing a relevant and useful interpretation of what was happening in the Australian cotton industry. Adhering to Burrell and Morgan's (1979) categorisation of paradigms, the assumptions underlying the research framework may be summarised in Table 1 below.

Table 1: Summary of Assumptions for each Theory Used in the Study

Assumptions	Structuration Theory (Meta-Theory)	Diffusion Theory (Functionalist Paradigm)	Gender Relations Theory (Radical Humanist Paradigm)
Ontology	Duality	Realist	Nominalist
Epistemology	Anti-positivist	Positivist	Anti-positivist
Human Nature	Duality	Determinist	Voluntarist
Methodology	Ideographic	Nomothetic	Ideographic

The intention of the authors is to submit the paper to a quality journal for review. However, the existing version of the paper needs to be re-worked. The IFIP WG 8.2 workshop is a fitting forum in which to discuss the issues of theoretical pluralism and to offer suggestions as to how the paper can be progressed further.

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8.5 Understanding the Interpretive Flexibility of Communication Systems

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The first aim of our study is to better understand and characterize a special type of IT artifact, i.e. communication systems (such as instant messaging tools). Communication systems present themselves as open and flexible tools that need interpretation to enfold their potential in context [Riemer et al., 2007a]. The second aim of the study is to make a contribution to the understanding of the construct of interpretive flexibility of IT.

For the information systems domain to gain further credibility and legitimization, the nature of its main object of interest - the IT artifact - warrants better understanding. While the discussion of the IT artifact has highlighted the technical as something that needs to be explicitly considered in IS research (otherwise how would it be distinct from social or organizational studies: The IT artifact constitutes IS), so far this discussion does hardly contribute to a more differentiated view of different types or genre of technology. The example of Nicholas Carr's paper "IT doesn't matter" illustrates quite drastically the shortcomings of an undifferentiated use of the IT artifact. IT artifacts differ widely in terms of a range of characteristics, one of which is their degree of interpretive flexibility, i.e. the degree to which a given artifact can be re-interpreted and changed in nature, appearance and function by its users in a social context and by the ways in which this re-interpretation happens.

Interpretive flexibility is defined as the ability of an IT artifact to represent different things to different people and is manifested in how people think of, interpret, or inscribe meaning to an IT artifact within their social context [Doherty et al. 2006]. Interpretive flexibility of IT artifacts shows up in the variety of uses and ways of application of the same technology in different contexts. Traditionally, the process of re-interpretation is treated as a matter of design or redesign: as an information system (i.e. software) is introduced to a social context people can change its nature and function by influencing modifications to the software as it is amended by the designers to fit the social context. This process is supposed to reach a state of closure when all problems have been resolved and changes have been implemented. Research in this domain has mainly looked at groupware, management information systems and ERP software.

Against this backdrop, our study focuses on a particular genre of IT: real-time communication systems (RTC), i.e. systems that integrate instant messaging, presence status functionality with voice and video communication [Riemer & Frößler 2007]. In order to appreciate the specifics and indeed affordances of RTC, it has to be seen as part of a broader ICT infrastructure. The usage of RTC assumes e.g. broadband network access and typically is embedded into a richer environment of applications, without being tightly integrated. RTC enables a set of modes of computer-mediated communication, some of which can be combined. We are trying to capture the specific ways in which users engage with RTC. In addition to facilitating various modes of communication (audio, chat, status signaling), it implies notions of availability, presence, awareness in a communication setting [Riemer et al. 2007b]. However, there is a considerable amount of flexibility towards the interpretation of what RTC does and does not or how the medium is shaping the message. Preliminary research on the use of the RTC tool Skype shows a great variance in usage patterns and interpretations by its users in different contexts; this points to a high degree of interpretive flexibility. As communication itself is a highly contingent way of acting (kommunikatives Handeln), RTC appears to be embedded in a multitude of communication settings and modes. Its role in these communicative acts varies a lot and is indeed open for different interpretations: Interpretations that reflect the actors' perspectives as much as different organizational-technical or socio-technical settings and certainly a range of interpretations of its affordances.

Drawing from these results, it becomes obvious that – contrary to reports on other types of IT artifacts – the flexibility of RTC is not the result of processes of redesign but has to be attributed to the ways in which the tools are appropriated by people in context. Hence, we argue that RTC systems are open,

general purpose tools that exhibit a high degree of interpretive flexibility that reveals itself as a result of appropriating the technology in situ. In this respect, communication systems differ from other types of technologies in that their set of features and characteristics does not reveal their potentials for usage in context, as is the case with other software. In ERP systems for example organizational processes and the logic of carrying out tasks becomes deeply embedded by way of their design [Kallinikos 2004].

Further research is needed to better understand the nature and complexities of communication systems (such as RTC) and the ways in which the systems become embedded in social practices. Following the above notion, existing research on RTC (i.e. instant messaging) can be criticized as following a technology determinism that tries to generalize the impact of the IT artifacts on organizational contexts. Viewing communication systems as exhibiting a high degree of inherent interpretive flexibility however requires more situated research approaches in order to grasp the complex interplay between the technology, its various complexities, characteristics of the context, the existing social practices and the meaning people inscribe to the technology. We plan to carry out more cross-case analyses that try to capture and learn from the diversity found in context; such research should explicitly aim at understanding first the appropriation processes that lead to shared communication practices and second the various characteristics of the technology that influence and shape these practices. As for suitable research methods rich methods of data collection are needed to appreciate and grasp existing social practices and their complexity and embeddedness. We expect our research to lead to a better understanding of the multi-faceted nature of the communication system artifact(s) and to make a contribution to the construct of interpretive flexibility. Most likely, different types of IT artifacts will be distinguished according to their (type/degree of) interpretive flexibility.

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8.6 Information Systems, Machine Agency and Social Structure

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Rose, Jones and Truex (2005) and five response articles (Hanseth 2005; Holmstrom 2005; McMaster et al. 2005; Orlikowski 2005; Walsham 2005) have squarely focused on a critical issue with the Information Systems discipline: the relationship between the IT artifact and the social collective in which it is implemented (organization, government or society). The relationship of the IT artifact within a social setting is truly at the heart of our research area (Benbasat et al. 2003; Orlikowski et al. 2001). It is also foundational to our understanding of the phenomena our field seeks to investigate. How can we understand such phenomena as acceptance/adoption/use of information systems if we don't understand how the organization relates to the information system? Surely any such approach will be impoverished.

In their paper, Rose, Jones and Truex (2005) offer an important discussion of the problem of social theory in information systems research. The key question is what is the relationship between technology and organization? In addressing this question, they review the positions of structuration theory and actor-network theory and how they view this key relationship. They close with six challenges that all deal with social theoretic issues and focus on the question of how IT relates to organizations. Can technology be said to have agency? If so, how does machine agency relate to human agency? How do technologies and organizations relate? What is the nature of the structure between them?

This paper seeks to give an answer to the question of machine agency by proposing that Margaret Archer's Analytical Dualist Social theory (AD) (Archer 1995) be employed as a social theory that is useful for explaining the relationship between machines, humans and human social structures. I believe that AD and the Critical Realist philosophy that under girds it, provide a way to conceptualize the relationship between the IT artifact and the organization that specifically deals with the IT artifact and provides a way forward to explaining such IS research topics as why software and systems are possess the features that they do, why implementation efforts often fail, how information system usage takes the configuration that it does etc.

In my presentation, I plan to make the following points
1. An introduction to Analytical Dualism and how it provides explanations of social structure change
2. A discussion of machine agency within the Analytical Dualist framework.
3. A theoretical account of the relationship between information systems and organizations.

This paper contributes to the discourse on agency and information systems begun by Rose, Jones and Truex by providing another social theory that provides a potential explanation.

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8.7 Theorizing the Multiple Roles of an IT Artifact in a Distributed, Mediated Problem Solving Practice: An Ecological Approach

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A distributed mediated practice is supported through an ecology of knowledge workers and technology artifacts including documents and data repositories. In this exploratory study, we take an ecological approach to understand how the introduction of an online knowledge base to a distributed, mediated help desk environment leads to a change in the problem solving practice. In so doing, we theorize multiple roles that the IT artifact takes on as it re-shapes the distributed mediated practice.

A longitudinal field study was conducted at the help desk that serves fifteen hundred geographically dispersed customers in the credit card division of a major financial services company in the US. These customers are responsible for generating reports that allow improved decision making in the consumer credit market. A team of four knowledge workers provide support for these customers in a help desk. The customers previously relied on the help desk and on peer-to-peer interactions to solve problems. This study looks at a two year period during which a knowledge base was implemented by the help desk team.

We collected data in two ways. First, using a post-implementation survey, we asked key help desk customers about the changes in their knowledge-seeking behaviors since the introduction of new knowledge base. In particular, we ask them to rank-order the pre- and post-knowledge base implementation importance of the three key sources of information to solve problems:
1. Knowledge workers at the help desk
2. Other peer customers
3. Knowledge base

Second, we analyzed the help desk records of all calls and emails in a log database during the two year period.

The analysis of our data shows that the introduction of a knowledge base is associated with an increase in the overall customer knowledge-seeking behaviors. The survey results further show that the introduction of a knowledge base led to the reduction in the knowledge-seeking behaviors from the help desk and from other peers. However, the increase in knowledge-seeking using a knowledge base was bigger than the reduction in knowledge-seeking behaviors using the other two sources. These changes seem to suggest that the knowledge base takes on at least three simultaneous, independent roles:

1. Knowledge Accelerator – Since the customers now have 24x7x365 access to information in the knowledge base, they are able to solve problems faster. This accounts for the reduction in the use of help desk.
2. Social Actor – The knowledge base becomes a proxy for peer-to-peer and help desk support and thus becomes a de facto social actor. This accounts for the reduction in the use of other peers.
3. Knowledge Expander – The knowledge base answers the simpler questions for customers and allows for more complex questions to be funneled to the help desk. This accounts for the pure increase in the overall knowledge seeing behaviors.

These results have important implications for knowledge management researchers and practitioners wrestling with knowledge repository business cases and personnel attributes.

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