THE ORGANIZING VISION FOR CLOUD COMPUTING IN TAIWAN

Shirley Ou Yang
Information Management, National Taiwan University
No.1, Sec. 4, Roosevelt Rd., Taipei City 106, Taiwan
d97725006@ntu.edu.tw

Carol Hsu
Information Management, National Taiwan University
No.1, Sec. 4, Roosevelt Rd., Taipei City 106, Taiwan
carolhsu@ntu.edu.tw

ABSTRACT

Cloud Computing has attracted increasing attention from both researchers and practitioners as a new paradigm of information technology. Many recent studies on technological innovation have focused on two confronting models: rational-actor decision and social construction. However, both models are rarely used at the industry level of analysis. This paper adopts the lens of organizing vision, and presents a secondary analysis on the institutional processes of the forming of the Cloud Computing industry in Taiwan. In doing so it examines several key institutional forces, including (1) community discourse, structure, and commerce; (2) IS practitioner subculture; (3) adoption of core technology; and (4) adoption and diffusion. Our findings suggest that the dynamics of institutionalization of society and technology in the collective sense better explain the formation of the Cloud Computing industry embedded in a large community network than the linear rational choice paradigm. These findings also suggest that decision makers in both the private and public sector should be more aware of the institutional forces that motivate them to adopt IT innovation.

Keywords: cloud computing, organizing vision, innovation transformation, innovation adoption and diffusion

1. Introduction

As the latest information technology (IT) architecture and business paradigm, Cloud Computing services are becoming increasingly widespread, and for many researchers, this new technology is profoundly important. Buyya et al. [2009] describe the idea of Cloud Computing as a "···massive transformation of the entire computing industry in the 21st century." Cloud Computing utilizes on-demand network access as a means to connect the user to a shared pool of resources (e.g., networks, servers, storage, applications, and services) based in the *cloud* (online), as opposed to the user actually possessing these resources on their computers. As this new paradigm is regarded as a solution for reducing IT investment costs, minimizing management effort, and improving business process [Armbrust et al. 2010], a growing number of industry-leading firms have jumped on the Cloud Computing bandwagon as the solution to their data needs. Recent International Data Corporation (IDC) cloud research forecasts that cloud-based services will jump from $17 billion in 2009 to $55.5 billion by 2014[IDC, 2010].

Recently, Cloud Computing has attracted significant attention from both researchers and government officials. Cloud platforms transcend national borders and bundle diversified market-oriented IT services for a global market. By doing so, the emerging Cloud Computing market challenges and reshapes the existing landscape of the IT industry. For many countries, enhancing the Cloud Computing capabilities of their domestic IT industry is critical for excelling in global competition. Examples of government-led projects include Britain's *G-Cloud* from their Digital Britain plan, the United States' *Apps.gov*, Japan's *Kasumigaseki Cloud* from their Digital Japan creation project, the European Union's *EuroCloud,* and South Korea's governmental Cloud Computing plan. Since most IT never gains momentum toward widespread adoption, the global Cloud Computing wave provides a unique potential case for IT and industry transformation.

The adoption and assimilation of IT innovation has been a key area of investigation within the Information Systems (IS) research community for the past two decades [Rogers 1995, Prescott & Conger 1995, Fichman 2000, 2007]. Prior research has offered a number of important insights, ranging from the motivations and factors that influence innovation adoption to the outcomes and processes of its diffusion [Cooper & Zumd 1990, Cool et al. 1997, Damsgaard and Lyytinen 2001]. Much of this literature is characterized by two distinct approaches: a rational-

actor decision perspective and a sociological perspective [Strang & Macy 2001, Kennedy & Fiss, 2009]. The first approach, the rational choice model, has been called the "dominant paradigm of IT innovation research" [Fichman 2004] and is rooted in economic literature. Most studies within this tradition assume that organizational adoption is directed by technical efficiency and related boosts to economic performance [Teece, 1980]. This linear discourse is commonly criticized as "overrationalized" and fails to provide plausible explanations for the institutional and technical complexities of modern organizational environments [Abrahamson, 1991]. The second approach represents a more sociological perspective, emphasizing the social embeddedness of technological innovation. This approach stems from a desire to appear legitimate to powerful constituents or various stakeholders.

For either approach, however, most studies have focused on the individual or organizational level of analysis. Very little empirical IS research has actually been conducted at the industry level. Chiasson and Davidson [2005] state that the diffusion of IT to diverse industries offers important opportunities for the IS field to develop its knowledge and broaden its relevance. New IT industries are likely to reveal novel phenomena, which were neglected in previous individual or organizational level studies on IT adoption and diffusion. Our aim is thus to respond to the call by IS scholars to take IT and industry studies seriously [Benbasat & Zmud 1999, Crowston & Myers 2004, Chiasson & Davidson 2005]. We argue that the diffusion of IT innovation among organizations is socially constructed by the technology discourse, as well as shared norms, values and beliefs about innovation. By observing the formation and change of this discourse and its impact on shaping organizations and legitimizing their actions, we can examine how closely institutional logic influences the social construction and diffusion of innovation.

To develop this argument, we draw on "organizing vision," a revised institutional view, as our analytical lens. Unlike a rational-actor decision model that claims early adopters are driven largely by logics of efficiency, we believe organizations are not alone in their struggle to make sense of IT. Instead, each individual organization belongs to the complex community of organizations in the dialogue process of development of technology discourses during the infant stage of innovation. Many stakeholders actively contemplate new technology to varying degrees of publicity, producing symbols, cultures, and values that lead to the formation of organized vision among community members and help diffuse new knowledge. Technology discourse not only facilitates this diffusion, but also helps to socially construct innovation through processes of interpretation, legitimization and mobilization [Swanson & Ramiler 1997].

The remainder of this paper is organized as follows. In the next section, we present a literature review on Cloud Computing and IT innovation, followed by introducing organizing vision as an analytical lens. We then detail our research methods. Next we analyze the organizing vision for Cloud Computing in Taiwan. Finally, we conclude with remarks about applying organizing vision and probe its three functions, which together facilitate the transformation and evolution of the Cloud Computing industry in Taiwan.

2. Literature Review

2.1. What Is Cloud Computing?

Cloud Computing services first emerged as an IT paradigm five years ago. It is first initiated by Amazon.com, several prominent technology companies, such as Google, SUN, IBM, Oracle, and Salesforce, soon followed. Combining elements of existing technologies such as virtualization, grid computing and distributed computing, Cloud Computing delivers scalable IT services via the Internet on a pay-per-use basis [Weinhardt et al. 2009]. Cloud services thus allow for more optimal resource utilization, easier access, and more effective cost reduction [Vaquero et al. 2009].

Currently, Cloud Computing services are divided into three layers: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). Each layer provides different business models. Weinhardt et al [2009] chose the term Cloud Computing ecosystems to describe "the interplay and competition between all players that realize different business models in the Cloud Computing context." Cloud Computing infrastructures are formed in a cluster-like structure, subverting conventional business models and providing profound new opportunities for IT entrepreneurs. Chen [2010] deems that emerging cloud services and applications enable integration and upgrades, restructuring existing IT practitioners in facilitating a brand new cloud industry ecosystem. For a country like Taiwan that has long engaged in industries of OEM server-based software, seizing Cloud Computing is crucial for surviving industry restructuring.

2.2. Literature on Cloud Computing

Since 2009, there has been a great increase in scientific publications on Cloud Computing [Buyya et al. 2009, Weinhardt et al. 2009]. Yang and Tate [2009] reviewed 58 Cloud Computing articles, and indicated that most of current Cloud Computing research is skewed toward technological issues, such as performance, network, and data management; however, a new theme regarding the social and organizational implications of Cloud Computing is

emerging. This result is similar to results reported by Martens et al's [2011]. According to their content analysis of Cloud Computing, there were 485 Cloud Computing-related articles from 2007-2010, with major topics including technology, costs, personnel, security, quality and compliance. However, there are some key differences in themes between scientific articles and those geared towards practitioners. Among 445 practitioner-oriented articles, general topics (20.7%), technical topics (14.4%), company perspectives in Cloud Computing (12.1%), company perspectives in IT outsourcing (8.3%), and SaaS provider (7%)/ Microsoft Azure (7%) were the six key topics, while general topics (40%), resource management (20.0%), Grid vs. Cloud Computing (20.0%), Saas/IT outsourcing (10%), and business management (10%) were listed as the major research topics within 40 science articles. This comparison shows the parallel development of the Cloud Computing discourse between academia and business.
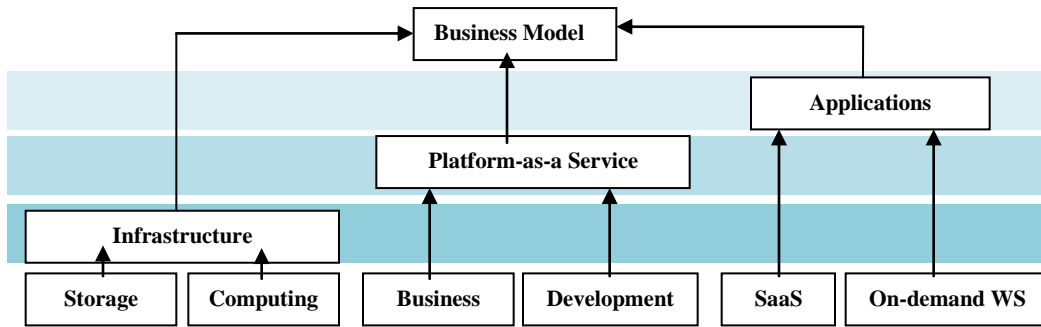

Figure 1: Cloud business model framework
Adapted from Weinhardt et al 2009

In general, the majority of research has so far focused on technical and economic issues, and only a handful of studies relate to security and adoption, as showed in Table 1. Weinhardt et al. [2009] propose five new research areas in the context of Cloud Computing: (1) application domain: issues on the IaaS level, such as maintaining capacities for testing purposes, dynamic purchasing of resources, and interactive web applications; (2) cloud API: a standardized API for migration of applications between the clouds of different providers; (3) business models: especially with respect to the licensing of software; (4) pricing of complex services: relates to pricing mechanism design, and (5) the long tail in clouds: developing products and services for many niche markets to identify the specific characteristics of the cloud environment. These research areas are in line with our survey of recent Cloud Computing research. Most research is based on a rational-actor decision model at the organizational level of study. Alternatives, such as social embeddness and the institutional setting of innovation have been barely studied in the literature. This paper, therefore, intends to fill this gap by investigating Cloud Computing from an organizing vision perspective and conducting an industry level of analysis. Its goal is to identify whether technology discourses play a significant role in spreading innovation during the initial stage of a technology's development.

Table 1: Recent Cloud Computing Research

Technology	Buyya et al., 2008; Youseff et al., 2008; Vaquero et al., 2009; Briscoe et al., 2009; Buyya et al., 2009; Vaquero et al.; 2009 Baars & Kemper, 2010
Business	Weinhardt, et al, 2009; Leimeister, et al., 2010; Koehler and Anandasivam, 2010
Pricing	Pueschel & Neumann, 2009; Anandasivam & Weinhardt, 2010
Adoption	Saya et al., 2010
Security	Ramireddy et al., 2010

3. Analytical Lens: Organizing Vision

The questions of how and why IS innovation has been widely adopted has remained a central topic in IS and organization studies. In the past two decades, significant progress has been achieved in furthering our collective understanding of the phenomena. Traditionally, the dominant paradigm of IT innovation research is deeply rooted in the rational choice models, in which the adoption of IT innovation is motivated by the technical efficiency and economic performance based on the adopters' independent rational decisions [Teece 1980, Strang & Macy 2001]. The new institutional theory, however, provides a different approach. The scholars within this tradition argue that not every outcome is the result of a conscious decision process [March & Olsen 1984, Scott & Meyer 1987, Powell & DiMaggio 1991], instead, they argue that institutions are composed of cultural-cognitive, normative, and regulative elements, that together provide stability and meaning to social life [Scott 2001, Scott & Davis 2007].

Although the concepts of institution and institutionalization have been defined in diverse ways, we emphasize the role of cultural cognitive process in the adoption and assimilation of IT innovation, which is not just referring to individual mental constructs, but also to common symbolic systems and shared meanings in social life. We employ Swanson & Ramiller's organizing vision framework [1997, 2003, 2004] to examine the adoption and assimilation of cloud computing in this case study, as it examines how social cognition drives the development, adoption, and diffusion of innovation in inter-organizational fields. Unlike the concept of collective sensemaking [Weick 1990, 1995], and technology frame [Orlikowski & Gash 1994, Davidson 2002] that normally deal with the collaborative process of creating shared awareness and understanding at the individual or organization level, organizing vision takes the unit of analysis on a broader perspective and analyzes the adoption process at an institutional level. This approach enables us to reflect on the specific role of a technology, its use and its impact on a specific sector, such as a country or countries. Therefore, it is well suited for use in exploring the cross-organizational discourses cloud computing drives within the IT industry in Taiwan.

Organizing vision represents the shared understanding of the organizational application of IT innovations that are established, maintained, and transformed through community discourse [Swanson & Ramiller 1997]. Previous research indicates that the spread of innovation at the early stage is based on economic-rational choices within organizations. However, Swanson & Ramiller believe from the very beginning innovation diffusion succeeds through institutional processes, not just through rational choices. The ultimate goal of innovation research is to provide guidance to managers on the question of "whether, when, and how to innovate with IT" [Swanson & Ramiller 2004].

Organizing vision of IT innovation—central to the early and late periods of diffusion—is created and used by a diverse inter-organizational community. This community, formed by heterogeneous networks of parties, collectively makes sense of innovations as organizational opportunities [Swanson & Ramiller 1997]. The community is comprised of developers, suppliers, customers, vendors, regulators, academics and journalists who contribute to such discourse. This community's discourses serve as the developmental engine for an organizing vision.

Laid out in the seminal work by Swanson and Ramiller [1997], a number of empirical investigations have employed the organizing vision perspective as a research lens to better understand the diffusion of different IT innovations. These studies include the examinations of organizing vision for CRM system [Firth 2001], application service provisioning [Kishore 2003, Currie 2004], electronic medical records [Davidson & Reardon 2005], the Wikipedia entry for Web 2.0 [Gorgeon & Swanson 2008], computerized physician order entry (CPOE) systems [Kaganer et al. 2010], and straight-through-processing (STP) [Lin & Hsu 2011]. These works have collectively created the value of organizing vision to explain how IS innovations originate, develop and diffuse over time, across firms and industries.

From the perspective of organizing vision, innovation adoption cannot be simplified as a linear determinism; rather, innovation is situated in its own history, needs, capabilities, and risks of adoption. This perspective is more social and historical, and is enriched by a pool of conceptual resources shared by the prospective adopter. Organizing vision opens up "windows of opportunity," serving as witnesses for an imagined future.

Swanson and Ramiller [1997] suggest that communities make sense of new technology through three aspects of the IT innovation process: interpretation, legitimization, and mobilization. First, organizing vision presents a community's on-going interpretations of the common social accounts of IT innovation: what it is about and how it could be used [Swanson & Ramiller, 1997, p460]. This public discourse explains the existence of technological innovation under a broader social, technological and economic context. Second, organizing vision provides an underlying rationale for IT innovation. Legitimization provides reasons to adopt; the isomorphic phenomenon of innovation adoption of organizations cannot be reduced to the behavior of a swarm. Organizing vision legitimizes innovation based on broader business considerations, allowing mangers to identify its value. Third, the vision also helps mobilize market forces to the material realization of the innovation. It plays a dynamic function to help activate, motivate and structure entrepreneurial and market forces that support the innovation's emergence in organizational practice. Together, these three aspects are beneficial to the shaping of "institutional production of organizing vision" [Swanson & Ramiller, 1997, p461].

Figure 2 illustrates institutional development of organizing vision, which is comprised of six features: (1) community discourse; (2) community structure and commerce; (3) subculture of information technicians; (4) business problems; (5) technology core; (6) innovation and distribution. These features could be segmented into four layers of organizational field: practical activity level, social structure level, interpretation and inference level, and cultural/linguistic level.

Swanson and Ramiller [1997] adopt the metaphor of a "hot-air balloon" to portray the flows and lifecycle of organizing vision. According to different combinations of practical activities and objects (technology invention, commerce, and adoption/diffusion), organizing vision may evolve and expand the vision, or it may fade into the

background of the cloud, losing the community's attention. Organizing vision may rise, fall, and drift along any number of complex paths, but still never arrive at a destination. When the organizing vision is institutionalized or abandoned, its ultimate fate is to be collectively forgotten.
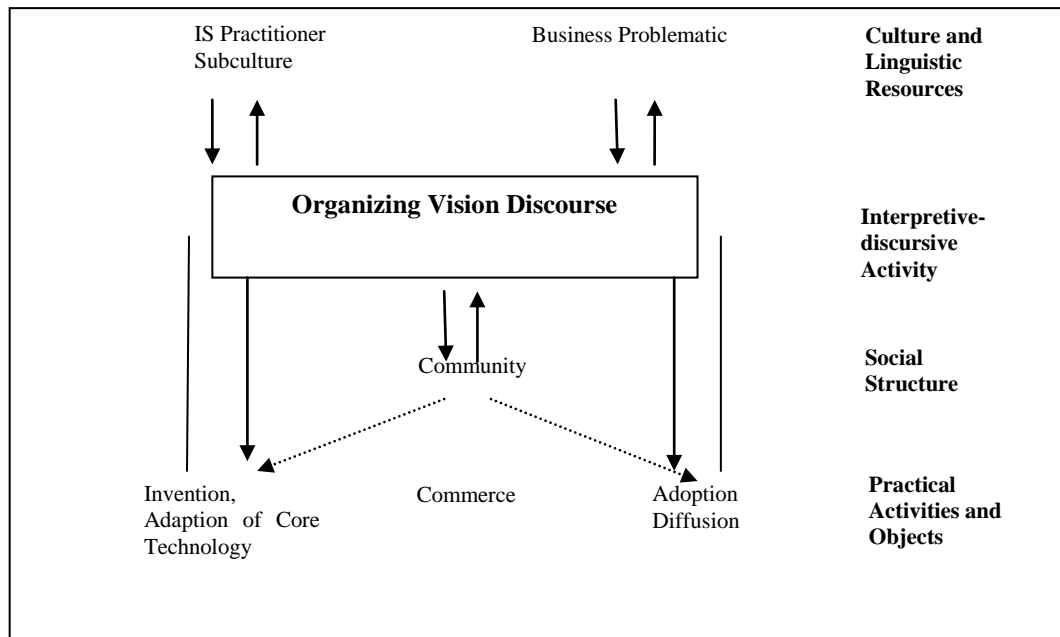

Figure 2: The Institutional Production of Organizing Visions
(Adapted from Swanson and Ramiller 1997)

4. Methodology

In this paper, we conduct a secondary data analysis to investigate the development of Cloud Computing industry cases in Taiwan. According to Bruce et al. [1984], one of the strengths of secondary data analysis is that the researcher can transcend the boundaries of time and space to accumulate massive data. It provides better scope and depth on a research topic than single-source, primary data gathering. Using documents and archives is beneficial in gathering a historical record of people's thoughts or actions, comparing different data of events over time.

There are three reasons to specifically adopt secondary data analysis for this study. First, original data is limited, because Cloud Computing has yet to be prevalent within the market. Relevant data is scattered among the documentation of company departments, internal and inter-organizational conferences, industry reports, and media outlets. The types and sources of documents are multiple and unorganized. Conducting cross-organizational research by collecting data from different sources, such as private and public sectors, helps us better observe the development of the Cloud Computing industry at the organizational ecological level.

Secondly, secondary data analysis preserves valuable historical records from the preliminary stages of innovation diffusion in Taiwan. The analysis contributes significantly to those interested in future studies and developments of Cloud Computing techniques. Thirdly, this data approach fits well with the interpretative stance of our theory—that we understand "reality" to be socially constructed and it can be articulated as a result of human sense-making activities on the part of participants and researchers [Orlikowski & Baroudi, 1991]. This research is conducted through various language sources, symbols and discourses, which makes it better fit for secondary data analysis. Besides, when the primary source of Could Computing is not abundant in Taiwan, secondary data analysis is a practical and economic approach.

An interpretative case study approach is adopted in order to obtain multiple interpretations of the cross-organizational evolution process of organizing vision over a period of time. Walsham [1993] argues interpretivist researchers conducting case research strive for "validity…not [from] the representativeness of such cases in a statistical sense, but on the plausibility and cogency of the logical reasoning, used in describing the results from the cases and in drawing conclusions from them." Data collection and analysis details as follows:

Data Collection: information collected from industry conferences, the Executive Yuan Gazette., business-related websites and blogs, Cloud Computing news coverage, relevant academic courses, studies, and research plans

in Taiwan. The documents collected were all in Mandarin Chinese and later translated into English. The research period is from January 2009 to August 2010.

Data analysis: the researcher first organizes the secondary data chronologically, lists major events of Cloud Computing in Taiwan, and cross-examines various data. We first analyzed the processes of Cloud Computing's major events. When there are inconsistencies within the same events, we triangulate data and findings on the same topic to examine different sources. After event analysis, based on the languages and symbols in the data as well as the analytical lens we adopted, we investigate the underlying Cloud Computing discourses in the context of Taiwan. Using this method, we processed partial and whole hermeneutic cycles of theory and data several times [Myers 2009] until we found sufficient evidence to account for representative signs, languages from various institutional forces.

Table 2: Source of Research Data

Industry conference	• Trend Micro "Cloud Computing Trend" Seminar, April 2009. • Invitation to Taiwan Executive Yuan"Information & Communication Security Strategy Review Board" Conference, August 2009. • Executive Yuan "Could Computing strategic development" forum, September 2009. • Invitation to Research, Development and Evaluation Commission "New Perspective in IT security in Cloud Computing era," July 2010. • Invitation to IDC "Cloud Computing Conference" August 2010. • Conference agenda and presentation materials were collected, consisting of hundreds of PowerPoint slides
Document archive	• Policy reports : Executive Yuan "2010 Major Policies and Programs," "Cloud Computing Industry Development Plan" • Gazette: Development and Evaluation Commission Monthly "An Interview of Cabinet member Jing- Fu Zhang on E-government & Cloud Computing" • Industry reports: White paper of Cloud Computing use cases. Institute of Information Industry "Cloud Computing applications and the business opportunity for Taiwanese IT practitioners," Trend Micro "The future of Threat and Threat Technologies," NIST IT Laboratory "Perspective on Cloud Computing and Standards," ENISA "Cloud Computing Risk Assessment" • News Release: Search keyword "Cloud Computing" and the major actors name at Yahoo Taiwan and Google Taiwan search engine, collected 72 news articles and interviews. Also collected news magazine articles on Cloud Computing from January 2009 to August 2010,including RunPC!, Scientific American, CommonWealth, GlobalView, Business Weekly, and Information Security
Online forum	• IT Knowledge Sharing Community http://ithelp.ithome.com.tw/question/10000239, collected all postings from January 2009 to August 2010. • Cloud Computing Association in Taiwan： http://www.twcloud.org.tw/Cloud/index.do, collected all postings from January 2009 to August 2010. • Salesforce.com： http://www.salesforce.com/tw/cloudcomputing/, collected all postings from January 2009 to August 2010. • TrendMicro Cloud Computing Security blog:http://cloudsecurity.trendmicro.com/, collected all postings from January 2009 to August 2010.
Reference websites	• Google：http://www.maximol.com.tw/cloudcomputing/ccs/aboutapps • Whitehouse：https://apps.gov/cloud/advantage/main/start_page.do • Open Cloud Computing Interface Working Group：http://www.occi-wg.org/doku.php • Cloud Security Alliance：http://www.cloudsecurityalliance.org/ • Jericho Forum：http://www.opengroup.org/jericho/

4.1. Case Background

The emergence of Cloud Computing reshapes the value chains of the IT industry, launching an era of global competition based on software and services. The US, South Korea, and other technologically-advanced countries are actively engaged in Cloud Computing policy planning, hoping it can sustain the forefront of their global competiveness, improve government efficacy and transform their IT industries. The UK, EU, Japan, China, etc. are setting up policy plans on Cloud Computing platforms, hoping to get a head start. Years after its launch, the concept of Cloud Computing has become the focus for governments concerned about the IT industry and the setup of its relevant infrastructures.

From the perspective of Taiwan's government, the emergence of Could Computing might tremendously challenge its existing IT-based industries. The strength of the domestic (Taiwan) hardware industry is manufacturing, yet the scale of its software industry is rather small, resulting in difficulties for Taiwan's hardware and software industries to restructure and collaborate. The government worries that its IT industries are being marginalized while other countries are turning to Cloud Computing as the mainstream technology of the times. Since 2010, the government has proposed a "Cloud Computing Development Industry Program," planning to invest 831 million USD in 5 years, letting 10 million people experience Cloud Computer Services, driving 450 million USD in investment in R&D and 3.5 billion USD in Cloud Computing. Through the program, the government seeks to create 50 thousand jobs and a Cloud Computing industry valued at 34 billion USD.

The Cloud Computing Development Program proposed by the Taiwanese government has two goals. First, it seeks to transform and upgrade the IT-based industry into a Cloud Computing one, giving Taiwan technical autonomy and advancing Cloud Computing services and systems, application software, system integration and service operation. Second, the program seeks to popularize Cloud Computing applications, developing Taiwan into a model of Cloud Computing service. The program incorporates the experiences of the government, IT businesses, and end users, and exports these experiences to other countries, aiming to improve national living standards, enhance government efficiency, and expand industry business (Cloud Computing Industry Development Programs, 2010).

5. Research Findings: the Organizing Vision of Cloud Computing and its Distribution

Stressing technology innovation and its irrational aspects of diffusion, organizing vision looks at the institutionalization process of IT innovation based on the organizational ecosystem, rather than the individual or single organization. It provides a story on how a cross-organizational community collectively makes sense of innovation, contributing to the discourse surrounding specific technology innovations [Wang & Ramiller 2004, 2007], and how the underlying "mindfulness and mindlessness" support or hinder adoption and diffusion [Swanson & Ramiller 2004]. To explore how the organizing vision for cloud computing disseminates in Taiwan. We structured our findings by adapting organizing vision framework Swanson and Ramiller [1997] proposed. Our findings are organized in the following sequence: (1) community discourse, structure, and commerce; (2) the IS practitioner subculture; (3) the adoption of core technology; and (4) adoption and diffusion. We preset some of the features appeared in adjacent sequences in group for the reason of conciseness.

5.1. Community Discourse, Structure, and Commerce

The formation of organizing vision comes from a collection of social actors who recognize its existence, and the vision is first produced and sustained through the discourse. The term 'Cloud Computing' was first introduced to Taiwan from a number of international Cloud Computing technology forerunners whose efforts in educating the global market were based on their market concern. In 2008, Cloud Computing pioneer, Google, first held a workshop, and strategically selected six universities in US and Asia, aiming at promoting the new concept to academia. The vision for Cloud Computing then stressed the high efficiency and data processing capability that Could Computing-based services could bring about.

Through this process, Cloud Computing became a *buzz word* among a small group of IT professionals, who were first 'educated' by the forerunners above. In 2008, Google launched a new browser, Chrome, declaring that "the future operating system is a web browser," and disclosing the vision of making Cloud Computing mainstream in the future. The company repeatedly sent its employees to Taiwan to visit the Industrial Technology Research Institute (ITRI), Institute for Information Industry (III), and to meet and exchange ideas with the top management of Taiwan's IT companies. However, at the time the organizing vision for Could Computing was not yet wide-spread in Taiwan, and domestic IT professionals in this initial stage saw Cloud Computing merely as "the latest trend of IT technology," but knew little about it.

Swanson and Ramiller [1997] suggest the discourse of organizing vision is shaped by a bunch of heterogeneous communities united by a common interest. Through their interactions, the discourses of vision for new technology,

both agreement and disagreement about its content, are enriched. These discourses draw actors who seek multiple business opportunities, in order to form and reform the discourse in an ongoing interpretation of the innovation's adoption and diffusion. In the case of Taiwan, in addition to Google's initiation, Trend Micro, a leading Taiwanese Internet security company also played an important role in promoting organizing vision for Cloud Computing. By taking collaboration with American Cloud Computing forerunners for upgrading their network security protection, Trend Micro became one of the first movers in the Cloud Computing market. By the end of 2008, Trend Micro introduced "Security in Cloud," its on-demand security service to the Taiwanese market, and stated that the issue of Internet security in the network age cannot be solved simply by purchasing software and hardware. Instead, they argued security can be more effectively tackled by taking into account Cloud Computing on-demand SaaS. The company also claimed that the evolution from individual information services and systems to Cloud Computing is just like "private-owned power generators in the past toward public-owned utility services." At this stage, the Cloud Computing discourse had gradually become a shared *buzz word* accepted by the community of IT practitioners, researchers, and Cloud Computing forerunners. Though IT practitioners could sense the pulse of IT transformation, they mostly chose to wait and see. There was no guarantee Cloud Computing services would succeed and become popular, or instead shortly disappear like other failed innovations.

By the end of 2009, various IT vendors such as Microsoft, IBM, VMware, and Cisco rolled out a variety of different Cloud Computing applications while Taiwanese companies remained in the exploration phase of technical and conceptual understanding without investment in the mass market. Only a few research institutes in Taiwan, such as ITRI, III, and Academia Sinica etc. started Cloud Computing research centers or conducted small-scale technology trials.

5.2. The IS Practitioner Subculture and Business Problems

Organizing vision draws meaning and language from a store of culture and linguistic resources provided in the subculture of IS practitioners [Swanson & Ramiller 1997]. Once the community finds the focus of the discourse, it can identify potential business problems. In this case, reflective comments from the chairman of Trend Micro during a Cloud Computing seminar raised problematic business issues. During a May 2009 speech, he declared that "the era of Cloud Computing has come. For IT enterprises, missing this wave, you will soon be out of the market." This technology discourse served as a wake-up call for IS practitioners in Taiwan and compelled them to take this new transformation into serious consideration.

This critical Cloud Computing discourse was presented not just for the benefit of individual organizations, but for the good of the whole IT ecosystem in Taiwan. The Cloud Computing community in the West had come into being through shared norms and beliefs; through the "Open Cloud Manifesto" in March 2009, more than twenty global IT players, such as IBM, Cisco, etc. jointly worked to create standards and generate shared principles to ensure compatibility among adopters. Trend Micro pointed out that Cloud Computing services are wide in scope, and that the entire Taiwanese IT industry might get phased out if the enterprises did not rely on teamwork to seize the market first and segment it later. Without taking a leading position to provide cloud infrastructure and services for Asian businesses, the IT industry in Taiwan could be marginalized, while US and Europe IT practitioners had long reached a consensus regarding cooperation on this matter. This suggests a business problem discourse to the Taiwanese IS practitioners in the Cloud Computing era.

Taiwan's IS practitioners' subculture is another factor that contributes to the formation of Cloud Computing discourse. In response to potentially losing the competitive edge of the entire Taiwanese IT industry, the Taiwanese government gradually fostered Cloud Computing as "the next Semiconductor Industry" with major governmental support. The government held a "Quasi-strategic Roundtable Board (SRB) Meeting for Cloud Computing," inviting global Cloud Computing leaders, practitioners, and more than five hundred local scholars and IS practitioners to exchange their knowledge and ideas on the new paradigm.

These global practitioners' language and discourse on Cloud Computing restructured local IS subculture and the worldview of local IS practitioners. Locals learned from the successful stories of global practitioners and exchanged ideas on best practices. Through networking with global practitioners, emerging discourses helped local IS practitioners make sense of the international competitive environment and the "lag" behind larger multinationals. This collaboration also helped converge what were originally diverging organizing visions; it focused simply on the product features and benefits of IT innovation, and helped reach consensus on a "to do or not to do" strategic position in facing future challenges and opportunities in world competitiveness. The consensus united various small and medium-sized IS enterprises who shared common interest in the "to do" cloud organizing vision.

On the other hand, the changing worldviews of the local IS practitioners also provided collective understanding to the organizing vision of Cloud Computing, causing a continuous co-evolution among organizing visions and the IS practitioners' subculture. After the discussion of the SRB meeting, the mainstream discourse of Taiwan's IS community recognized that the Cloud Computing market is a life or death battle for the next generation of Internet

transformation. Therefore, IS practitioners shifted their focus on Cloud Computing from technical feasibility to issues of practical and strategic value, such as "what applications are suitable for Cloud Services," "what data can be applied to Cloud Computing," and "what opportunities are posed for Taiwanese industries?" Moreover, this business problem discussion is another factor that facilitates the development of organization vision; it defines basic relevancy of organizing vision in a material economy [Swanson & Ramiller 1997]. One cabinet member described the outcome of this meeting: "Taiwan's Cloud Computing has finally found a sense of direction."

In April 2009, based on the results of the meeting mentioned above, the Taiwanese government passed the "Cloud Computing Industry Development program." Research institutes and information communication practitioners initiated a "Taiwan Cloud Computing Industry Alliance," linking more than 50 local IT and service practitioners to promote a highly integrated software/hardware cloud ecosystem and provide three types of cloud service applications. The aim of this association was to fashion Taiwan into a Cloud Computing technology innovation base, and establish a global competitive Cloud Computing industry chain. In the meantime, the Taiwanese government also established a Cloud Computing industry steering group to provide policy guidance to market players. In this case, we discovered that the heterogeneous community collectively constructed a Cloud Computing organizing vision in Taiwan. Together, this community transformed Cloud Computing into a window of opportunity. Through the "interpretation" and "legitimization" of these vision discourses, community members intentionally turned to future expectations. Therefore, these opportunities are technically and historically socially constructed [Swanson & Ramiller, 1997].

5.3. The Invention, Adoption of Core Technology

The development of organizing vision is both constrained and enabled by the core technology. According to Orlikowki's [1992] adaptive structure theory, when an industry community adopts Cloud Computing technology, the technology will shape and be shaped by the organizing vision in a reciprocal manner. Swanson and Ramiller [1997] indicate that core technology draws technology artifacts, organizational forms and work practices together.

One of the major characteristics of Cloud Computing is that its features, such as Infrastructure-as-a-Service (IaaS), Software-as-a-Service (SaaS) and Platform-as-a-Service (PaaS) involve the information infrastructure of countries. No single enterprise could completely dominate its services. Likewise, the interconnectivity of technology also expedites the development of organizing vision for Cloud Computing. For example, the Open Cloud Computing Interface Working Group, Jericho Forum etc. links individuals who share the same global interests in Cloud Computing. In the cloud, everyone is a client of each other; national frontiers are no longer boundaries for enterprises.

In our case, the interconnectivity of the cloud fosters collaboration among Asian countries. In November 2009, Asia's leading five telecommunication companies—China Mobil, Japan's NTT DoCoMo, South Korea's Telecome, Hong Kong's PCCW and Taiwan's Chunghua Telecome—held a "Cloud Roundtable Forum." In the following May, Chunghua Telecom proposed a plan to strategically ally with China Telecom, Singapore Telecommunications, and Japan NTT, to implement an international under-sea cable in response to increased data transmission between Taiwan and the globe. China Telecom has also taken the lead in building a Cloud Computing center and platform, cooperating with Trend Micro and Microsoft Taiwan, and aims at being a champion for Asian Cloud Computing services.

When Cloud Computing pioneers—Google, Microsoft, Apple—expand their territories by acquiring and merging small cloud application companies, strategically allying with multinational companies, Taiwan's core IT businesses also started a transformation, heading for Cloud Computing. For example, in August 2010, Chunghua Telecom invested 5.9 billion NTD to build two large Internet data centers (IDC) as a bridge for Taiwan's small and medium-sized enterprises to jump on the Cloud Computing bandwagon. In the same year, Quanta, a manufacturer of laptop computers, reorganized itself to start its own Cloud Computing Business. It now studies micro-cloud applications of regional sensitive data services and is actively involved in research and innovation. Likewise, the information security leader Trend Micro also established its first subsidiary, TCloud Computing, in 2010. The company plans to attract major Asian and European companies to adopt its platform and upset the monopoly of Google, Microsoft, and so on. These enterprises also collaborate with domestic and foreign universities and research institutes, actively cultivating talent for the Cloud Computing industry. This collaboration, IT transformation, and resource reallocation reflect what Swanson and Ramiller [1997] refer to as organizing vision challenging technology and being challenged by the technology's latent and evolving potential.

5.4. The Adoption and Diffusion of Cloud Computing

During the process of innovation and diffusion, organizing vision is formed and reformed in an ongoing interpretation of innovation. Swanson and Ramiller [1997] point out that individual organization rarely acts alone. It is typically supported by venders, consultants, subcontractors, and other business partners, especially in the early

stage of an innovation's diffusion, when adopters cannot easily gain community resources. In our case, the Taiwan government's *Cloud Computing Industry Development Program* and the corporate self-organized *Cloud Computing Industry Association of Taiwan* integrate ICT and IT service providers, urging Taiwanese business owners to devote themselves to the Cloud Computing industry. In 2010, Taiwan and China signed a "Cross-Strait Economic Cooperation Framework Agreement" (ECFA), setting Cloud Computing as one of their prioritized areas for cooperation. In August, the Taiwanese government started to draw foreign and domestic capital for its Cloud Computing plans, thus putting Taiwan in tune with global trends and snowballing Taiwanese enterprise's strategic investment on Cloud Computing. Organizing vision for Cloud Computing has become what Swanson and Ramiller [1997] expect: the drive of "mobilization."

According to a recent 2011 survey, nearly 60.1% of Taiwanese large enterprises expressed their willingness to adopt Cloud Computing services and expect Cloud Computing to be a mainstream information need for enterprises in the future [Market Intelligence & Consulting Institute, MIS survey), further implying how the Cloud Computing trend is unstoppable. Meanwhile, referring to the practices of South Korea, Chunghua Telecom played the role of a locomotive, announcing the establishment of a large-scale "Cloud Computing test center," providing a platform for testing and services, and facilitating the members of the "Cloud Computing Association" to develop and test commercial practices of cloud services.

Both the government's efforts and industry networking in Taiwan support the earlier adoption of a unique, understandable, reasonable, vital organizing vision that continuously sustains and expands innovation diffusion. Swanson and Ramiller [1997] note that such "compelling stories" enabled the early adopters to start embracing innovation, and pushed the major system integration providers in Taiwan, such as Trade-Van, Wistron, Ling groups, and Jauquin Information, to start actively supporting research and development and launch their own cloud application services in 2011.

Successful innovation adoption and distribution requires the support of different layers of interpretation. The story of earlier adopters must be told, shared and communicated within the community to sustain the rise and drift of an organizing vision, and must be allowed to continuously evolve through stakeholder modifications. In this study, the researchers found that several mechanisms contribute to the process of storytelling. For example, increasing news coverage and magazine reports cover Cloud Computing organizing vision by repeating the images of "success stories." Starting from 2010, at least two to three Cloud Computing seminars are held each month by various early adopters or corporate bodies to introduce diversified strategic concepts, products, and applications to Taiwan's IS communities.

These successful innovative organizations serve as role models for potential adopters. Following the steps of the incumbent Chunghwa Telecom, new telecom operators, such as Taiwan Mobile and Fareastone also made plans to build Cloud Computing IDC in different cities. Moreover, the Taiwanese government now holds large-scale, global 'Invest in Taiwan' orientations to attract foreign investment, actively inviting investments from the US and Japan.

This evidence explains an ongoing evolution of organizing vision for Cloud Computing organization, and its discourses continue to reshape the processes of innovative adoption and distribution over time. Success stories help to conceptualize Cloud Computing through interpretation, facilitating the legitimization of Cloud Computing and rationales for adoption. The lessons learned from the first successful Cloud Computing adoption help highlight when, why and how to launch a Cloud Computing innovation. In this case, organizing vision, though commonly accepted or sometimes questioned, informs those interested in the vision about innovation opportunities and merits, and facilitates production activities and market exchanges of material processes for innovation. This demonstrates why Swanson and Ramiller [1997] call organizing vision the driving force in facilitating the adoption of new innovation.

6. Discussion and Conclusion

In our study, we incorporate an organizing vision lens to evaluate the institutionalization process of Cloud Computing in Taiwan. Our overall findings support the premise that adoption and assimilation of IT innovation is not solely based on technology efficacy. The results are in line with Swanson and Ramiller's [1997, 2003, 2004] argument that when an individual organization makes a rational choice, many considerations do not come from within the organization; rather, they are embedded in a larger community network, connecting mainly with internal cycles of interpretation to those at the institutional level. This process of institutionalization manifests itself when various stakeholders make sense collectively of innovation, and thus becomes a normative pressure within the community. The organizing vision serves the core of these interpretive activities. In this case, we see how different actors, such as Trend Micro, the Taiwanese government, global and local IT practitioners, research institutions and journalists, collaborate to create an organizing vision to interpret, legitimate and mobilize resources in shaping Cloud Computing diffusion within the Taiwan IT industry.

When a new technology starts to diffuse, institutionalized environments will make sense of the emerging technology and its potential values. In our case, the concept and whispering of Cloud Computing was embedded in a broader global market and technology network, with a large group of stakeholders: international forerunners, domestic IS practitioners, as well as academic and other research institutes (the Information Industry, Industrial Technology Research Institute, and the Executive Yuan Science and Technology Advisory Group, Department of Industrial Technology in Taiwan). These stakeholders collectively defined and clarified the characteristics and applications of Cloud Computing. Through their conversations and interpretations in conferences and seminars, they helped form collective meaning—the discourse of organizing vision of Cloud Computing. This pragmatic evidence echoed the views of a deeper relationship underlying the technological and industry structures in the diffusion process [Crowston & Myers 2004, Chiasson & Davidson 2005].

In addition to interpretation, the institutional forces also support the legitimization and mobilization functions in developing organizing vision. Several recent studies have begun to investigate how institutional factors shape the diffusion of IT innovations, advancing the original OV landscape from assessing institutional effects to understanding institution building. For example, Wang and Swanson [2007] found that institutional entrepreneurs play a significant role in making favorable institutional arrangements for innovation in the very early phase of diffusion. In line with their findings, we also found two major actors in our case (Trend Micro, a Cloud Computing pioneer, and the Taiwanese government) hand-in-hand taking the lead as institutional entrepreneurs to facilitate and persuade community members and help the deployment of innovation.

Yet, unlike Wang and Swanson's [2007] suggestion that institutional entrepreneurs incorporate success stories in order to launch IT innovation, in our case the driving force encouraging local IT practitioners to jump into the Cloud Computing bandwagon is the motivation to avoid losses, rather than motivations for profit and efficiency gains. Kennedy and Fiss [2009] suggest that early adoption is associated with opportunity farming and motivations to achieve gains, while late adoption is associated with threat framing and motivations to avoid losses. Our case reveals that local IT practitioners hold the motivations for late adopters rather than early adopters as Kennedy and Fiss [2009] suggest. When Trend Micro points out their collective business problem—the original equipment manufacturing (OEM) based Taiwanese IT industry might be marginalized in the global Cloud Computing wave— the legitimization of organizing vision for Cloud Computing does not simply involve an individual enterprise, but rather cross-enterprise organizations. Therefore, the issues of organizational-level discourse become an isomorphic concept of national competitiveness, an institutional level problem. As a result, they win the attention of the public sector, which spearheads relevant coordination to increase the legitimacy of cloud vision.

The differences of Wang and Swanson's findings and ours might result from the different cultural context of these two studies. Carton et al. [2007] identifies significant differences between France and the US in organizing vision production systems and their cross-organizational discourse. They find that the organizing vision for IT innovations in France is often centered on technological concepts, such as ERP, tracking capability etc., and more specifically along institutional lines. In contrast, the American OV for IT innovation are more directly centered on specific products or product types, and the OV content is greatly enriched through local visions. These differences help explain why threat framing drives OV for Cloud Computing in Taiwan more clearly. From a global markets viewpoint, American companies generally have greater autonomy with leader-oriented strategies, while Taiwanese IS practitioners first make sense of international competition and "lag" behind larger multinationals. Thus, although IS practitioners in the local market adopted the Cloud Computing vision early, they still regard themselves as late adopters in the global market, and are therefore driven by threat framing.

Regarding mobilization, our findings show that community networks and strategic alliances also serve as an institutional vehicle to transmit knowledge of Cloud Computing among global and local businesses. For example, global players such as Google and Trend Micro first introduced innovation and development of Cloud Computing to local businesses, whereas Taiwan's IS communities, infused by the new concepts and worldviews of global players on local industry, struggled to set their strategic positions in the global economy. Therefore these local companies went beyond the individual or organizational level, and structured their vision based on a cloud ecosystem approach with the support of the Taiwanese government, bringing a broader mobilization. This study also witnessed clear institutionalization: how Cloud Computing shapes the market while also being shaped by the invisible hand of the market. The threat framing and large-scale investment activities after the ECFA accelerated the mobilization of the competitors of the early adopters, pushed them to enter the market. As a result, the vision of Cloud Computing is spread among the Taiwan IT industry. This is the manifestation of the mobilization of organizing vision.

Kaganer et al. [2010] investigate the role of legitimacy and legitimation in shaping diffusion of IT innovations and suggest that alliance-related strategies are aimed at building influence legitimacy among actors in the entrepreneurial community. Likewise, Möller and Svahn [2003] suggest that a strategic business network facilitates firms to overcome the dispersion of knowledge and technological resources by seeking knowledge transfer, and

more ambitiously, the joint creation of knowledge and innovations through vertical and horizontal networking [Powell et al. 1996, Teece et al. 1997]. Worthy to mention, unlike the US leaving the business networking to market forces, the Taiwanese government is regarded as an engine to legitimize and mobilize the alliance in the entrepreneurial community, and aid the deployment of innovation. The interesting role the government plays in organizing vision demonstrates how a *developmental state* strategically engages in the forming of discourses so as to create and promulgate coherent visions [Wade 2004, Wang & Swanson 2007].

Our findings also echo the argument in Agarwal and Lucas [2005] and Crowston and Myers [2004] that advanced information technologies have a potential to foster profound transformational effects involving not only individual organizations but also entire industries. This study witnesses the ongoing processes of institutionalization between IT innovation and society (including global and local IS practitioners, businesses, research and development institutes, researchers, governments and journalists etc.) with the organizing vision as its core. This innovation is shaping and shaped by organizing vision, and organizing vision is modified and reshaped throughout the constant discussion and communication of symbols and discourses, thus resulting in new cognition, attitude, assumptions and different social practices and institutional constraints.

Still, our case study presents an example of how an Asian *developmental state* responds to the global market in a knowledge-based society. Gibbons [1994] states that the ability to reconfigure knowledge is a strategy normally adopted by industrial nations to gain comparative advantage in the context of global economic competitiveness. With the rapid development and spread of industrial capitalism, *developmental states* such as Taiwan, South Korea, and Japan, learned to reconfigure their national social capital through the close cooperation of public and private sectors, and bureaucratic elite organization, together fostering the development of domestic industries. This phenomenon could be regarded as a means by which the local bounces back against the institutionalization of the global. The organizing vision of technology innovation plays a significant role in framing the isomorphic phenomenon globally.

In sum, our secondary data analysis approach is helpful for looking outside from a single organization point of view to extending research beyond the organizational boundary. Our contribution to IT innovation literature is this insight on the institutional processes involved in shaping the diffusion of Cloud Computing at a cross-organizational level. We also contribute to the Cloud Computing literature by expanding the current research scope with this Cloud Computing ecosystem approach in the context of an Asian *developmental state*. This study adds further value to decision makers both in the private and public sector, by making them more aware of the institutional factors that motivate them to adopt IT innovation. For adopter firms, our research will help inform better adoption decision-making from a global market view.

Drawing on Matens et al. [2011] sentiment analysis of Cloud Computing discourses, additional work is suggested to understand how positive and negative discourses affect the drifting of an organizing vision. Future research would shift this focus to further longitudinal models of practice adoption and its relationship with the life cycle of the organizing vision.

Acknowledgments

REFERENCES

Agarwal, R. and H. Lucas Jr., "The Information Systems Identity Crisis: Focusing on High-Visibility and High-Impact Research," *MIS Quarterly*, Vol. 29, No. 3:381-398, 2005.

Abrahamson, E., "Management Fads and Fashions: The Diffusion and Rejection of Innovations", *Academy of Management Review*, Vol. 16, No. 3:586-612, 1991.

Anandasivam, A. and C. Weinhardt, "Towards an Efficient Decision Policy for Cloud Service Providers," proceeding of International Conference on Information Systems, 2010.

Armbrust, M., A. Fox, R. Griffith, A. Joseph, R. Katz, A. Konwinski, G. Lee, D. Patterson, A. Rabkin, I. Stoica, and M. Zaharia, "A View of Cloud Commpting," *Communications of the ACM*, Vol. 53, No. 4:50-58, 2010.

Baars H. and H-G. Kemper, "Business Intelligence in the Cloud?" Proceeding of Pacific Asia Conference on Information Systems, 2010.

Benbasat, I. and R. Zmud, "Empirical Research in Information Systems," *MIS Quarterly*, Vol. 23, No.1: 3-16, 1999.

Briscoe, G., and A. Marinos, "Digital Ecosystems in the Clouds: Towards Community Cloud Computing," proceeding of Digital Ecosystems and Technologies Conference, 2009.

Bruce, A., M. Howard, and L. Stan, Social Science Research Methods, Prentice-Hall, Inc., New Jersey, 1984.

Buyya, R., C. Yeo, S. Venugopal, J. Broberg, and I. Brandic, "Cloud Computing and Emerging IT Platforms: Vision, Hype, and Reality for Delivering Computing as the 5th Utility," *Future Generation Computer Systems*, Vol. 25, NO. 6:599-616, 2009.

Buyya, R., C. Yeo, S. Venugopal, "Market-oriented Cloud Computing: Vision, hype, and reality for delivering IT services as computing utilities," Keynote paper, proceeding of the 10th IEEE International Conference on High Performance Computing and Communications, 2008.

Chen, Y., Cloud Computing Strategy, Taipei: CommonWealth, 2010.

Chiasson, M. and E. Davidson, "Taking Industry Seriously in Information System Research," *MIS Quarterly*, Vol. 29, No. 4:591-605, 2005.

Cool, K., I. Diericks, and G. Szulanski, "Diffusion of Innovations within Organizations: Electronic Switching in the Bell System, 1971-1982," *Organization Science*, Vol. 8, No. 5:543-559, 1997.

Cooper, R. and R. Zmud, "Information Technology Implementation Research: A Technological Diffusion Approach," *Management Science*, Vol. 36, No.2:123-139, 1990.

Crowston, K. and M. Myers, "Information Technology and the Transformation of Industries: three research perspectives," *Strategic Information Systems*, Vol. 13, No.1:5-28, 2004.

Currie, W., "The Organizing Vision of Application Service Provision: a process-oriented analysis," *Information and Organization*, Vol. 14, No. 4:237- 267, 2004.

Dacin, M., J. Goodstein and W. Scott, "Institutional Theory and Institutional Change: Introduction to the Special Research Forum," *Academy of Management Journal*, Vol. 45, No.1: 45-56, 2002.

Damsgaard, J., and K. Lyytinen, "The Role of Intermediating Institutions in the Diffusion of Electronic Data Interchange (EDI): How Industry Associations Intervened in Denmark, Finland, and Hong Kong," *Information Society,* Vol. 17, No.3:195-211, 2001.

Davidson, E., "Technology Frames and Framing: A Socio-cognitive Investigation of Requirements Determination," *MIS Quarterly*, Vol. 26, No.4:329-358, 2002.

Davidson, E., and J. Reardon, "Organizing Visions for IT Healthcare: Analysis of the Discourse Surrounding Electronic Health Records," proceeding of Academy of Management Conference, 2005.

DiMaggio, P. and W. Powell, "The Iron Cage Revisited: Intuitional Isomorphism and Collective Rationality in Organizational Fields," *American Sociological Review*, Vol.48, No.2:147-160, 1983.

Fichman, R., "Going Beyond the Dominant Paradigm for Information Technology Innovation Research: Emerging Concepts and Methods," *Journal of the Association for Information Systems*, Vol. 5, No. 8:314-355, 2004.

Firth, D., "The Organizing Vision for Customer Relationship Management," Proceedings of the Seven Americas Conference on Information Systems, Boston, MA, pp. 834-840, 2001.

Gibbons, M., C. Limoges, H. Nowotny, S. Schwartzman, P. Scott, and M. Trow, The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies, London: Sage Publications, 1994.

Gorgeon, A. and E. Swanson, "Organizing the Vision for Web 2.0: A Study of the Evolution of the Concept in Wikipedia," proceeding of WikiSym, 2009.

Kaganer, E., A. Pawlowski, and S. Wiley-Patton, "Building Legitimacy for IT Innovations: The Case of Computerized Physician Order Entry Systems," *Journal of the Association for Information Systems*, Vol. 11, No. 1:1-33, 2010.

Kishore, R., "Implementation of the ASP Organizing Vision: The Role of Participation and Trust," *Business Strategies for Information Technology Management*, IGI publishing, Hershey, PA, pp. 160-167, 2003.

Kennedy, M. and P. Fiss, "Institutionalization, Framing, and Diffusion: The logic of TQM adoption and implementation decisions among U.S. Hospitals," *Academy of Management Journal*, Vol.52, No.5:897-918, 2009.

Koehler, A. and A. Anandasivam, "Cloud Services from a Consumer Perspective," proceeding of Americas Conference on Information Systems, 2010.

Iacovou, C. "Electronic Data Interchange and Small Organization: Adoption and Impact of Technology," *MIS Quarterly*, Vol. 19, No. 4:465-485, 1995.

IDC "IDC's New IT Cloud Services Forecast: 2009-2013," 2009. Retrieved from http://blogs.idc.com/ie//?p=730

Leimeister, S., C. Riedl, M. Bohm, and H. Kremar, "The Business Perspective of Cloud Computing: Actors, Roles, and Value Networks," proceeding of European Conference on Information Systems, 2010.

Lin, Y. and C. Hsu, "Unfolding the Organizing Vision for Straight-Through-Processing in Taiwan Financial Industry," proceeding of Hawaii International Conference on System Sciences, 2011.

March, J. and J. Olsen, "The New Institutionalism: Organizational Factors in Political Life," *The American Political Science Review*, Vol. 78, No.3, 1984.

Martens, B., J. Poeppelbuss, and F. Teuteberg, "Understanding the Cloud Computing Ecosystem: Results from a Quantitative Content Analysis," proceeding of Wirtschaftinformatiks, 2011.

Möller, K. and S. Svahn, "Managing Strategic Nets—A Capability Perspective," *Marketing Theory*, Vol. 3, No. 2:209-234, 2003.

Myers, M., Qualitative Research in Business & Management. LA: Sage, 2009.

Orlikowski, W., "The Duality of Technology: Rethinking the Concept of Technology in Organizations," *Organization Science*, Vol. 3, No. 3:398-427, 1992.

Orlikowski, W. and D. Gash, "Technological Frames—Making Sense of Information Technology in Organizations," *ACM Transactions on Information Systems,* Vol. 12, No. 2:174-207, 1994.

Orlikowski, W. and J. Baroudi, "Studying Information Technology in Organizations: Research Approaches and Assumptions," *Information Systems Research*, Vol. 2, No. 1:1-28, 1991.

Orlikowski, W. and S. Barley, "What can Research on Information Technology and Research on Organizations Learn from Each Other?" *MIS Quarterly*, Vol. 25, No.2:145-165, 2001.

Perrow, C., Complex Organization: A Critical Essay (3rd ed.), New Work: McGraw-Hill, 1986.

Powell, W. and P. DiMaggio, The New Institutionalism in Organizational Analysis, Chicago: University of Chicago Press, 1991.

Prescott, M. and S. Conger, "Information Technology Innovations - a Classification by IT Locus of Impact and Research Approach," *Data Base for Advances in Information System*, Vol. 26, No.2-3:20-41, 1995.

Premkumar, G. and S. Nilakanta, "Implementation of Electronic Data Interchange: An Innovation Diffusion Perspective,' *Journal of Management Information Systems*, Vol. 11, No. 2:157-186.

Premkumar, G. and K. Ramamurthy, "The Role of Interorganizational and Organizational Factors on the Decision Mode for Adoption of Interogrannizational Systems," *Decision Science*, Vol. 26, No. 3:303-336, 1995.

Pueschel T. and D. Neumann, "Management of Cloud Infrastructures: Policy-Based Revenue Optimization," proceeding of International Conference on Information Systems, 2009.

Ramireddy, S., R. Chakraborthy, and T. Raghu, "Privacy and Security Practices in the Arena of Cloud Computing-A Research in Progress," proceeding of Americas Conference on Information Systems, 2010.

Rogers, E., Diffusion of Innovations (5th ed.), New York: The Free Press, 2003.

Saya, S., L. Pee, and A. Kankanhalli, "The Impact on Institutional Influences on Perceived Technological Characteristics and Real Options in Cloud Computing Adoption," proceeding of International Conference of Information Systems, 2010.

Scott, R., Institutions and Organizations (2th ed.), California: Sage, 2001.

Scott, R., "The Adolescence of Institutional Theory," *Administrative Science Quarterly*, Vol. 32, No. 4:493-511, 1987.

Scott, R. and G. Davis, Organizations and Organizing—Rational, Natural and Open System Perspectives, New Jersey: Pearson Education, Inc., 2007.

Strang, D. and M. Macy, "In Search of Excellence: Fads, Success Stories, and Adaptive Emulation," *American Journal of Sociology*, Vol. 107, No.1:147-182, 2001.

Swanson, E., and N. Ramiller, "The Organizing Vision in Information System Innovation," *Organization Science,* Vol.8, No. 5:458-474, 1997.

Swanson, E. and N. Ramiller, "Organizing Visions for Information Technology and the Information Systems Executive Response," *Journal of Management Information Systems*, Vol. 20, No. 1:13-50, 2003.

Swanson, E. and N. Ramiller, "Innovating Mindfully with Information Technology," *MIS Quarterly*, Vol. 28, No.4:553-583, 2004.

Suchman, M., "Managing Legitimacy: Strategic and Institutional Approaches," *Academy of Management Review*, Vol. 20, No.3: 571-610, 1995.

Teece, D., "The Diffusion of an Administrative Innovation," *Management Science*, Vol. 26, Vo. 5:464-467, 1980.

Teece, D., G. Pisano, and A. Shuen, "Dynamic Capabilities and Strategic Management," *Strategic Management Journal*, Vol. 18, No. 7:509-533, 1997.

Tolbert, P. and Zucker, L., "Institutional Sources of Change in the Formal Structure of Organizations: The Diffusion of Civil Service Reform, 1880-1935," *Administrative Science Quarterly*, Vol.28, No.1:22-39, 1983.

Vaquero, L., L. Rodero-Merino, J. Caceres, and M. Lindner, "A Break in the Clouds: Towards a Cloud Definition," *ACM SIGCOMM Computer Communication Review*, Vol. 39. No. 1:50-55, 2009.

Wade, R., Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization (2nd ed.), New Jersey: Princeton University Press, 2004.

Walsham, G., Interpreting Information Systems in Organization, Chichester: Wiley, 1993.

Wang, P. and N. Ramiller, "Community Learning in Information Technology Fashion," proceeding of International Conference of Information System, 2004.

Wang, P. and E. Swanson, "Launching professional services automation: Institutional entrepreneurship for information technology innovations," *Information and Organization*, Vol. 17, No. 2:59-88, 2007.

Weick, K., "Technology as Equivoque: Sensemaking in New Technologies, " in P. S. Goodman & L. Sproull (Eds.). Technology and organizations, San Francisco: Joss-Bass, 1990.

Weick, K., Sensemaking in Organizations, California: Sage, 1995.

Weinhardt, C., A. Anadasivam, B. Blau, N. Borissov, T. Meinl, W. Michalk, and J. Stößer, "Cloud Computing—A classification, Business Models, and Research Directions," *Business & Information Systems Engineering*, Vol. 1, No.5:391-399, 2009.

Weinhardt, C., A. Anandasivam, and J. Stoesser, "Business Models in the Service World," *IT Professional*, Vol. 11, No.2:28-33, 2009.

Yang, H. and M. Tate, "Where Are We at with Cloud Computing? A Descriptive Literature Review," proceeding of Australasian Conference on Information Systems, 2009.

Youseff, L., M. Butrico, and D. Da Silva, "Towards a Unified Ontology of Cloud Computing," *Grid Computing Environments Workshop*, 2008.