

From the Faculty Editor

This is the second edition of the iSChannel, a journal on the social study of Information Systems, produced, edited and double-blind peer reviewed by the students of the Information Systems and Innovation Group at the LSE. The papers provide a fascinating snap-shot of the interests of the MSc students within the group. Core subjects such as Information systems development remain of concern, with articles on agility, project escalation and user involvement included in this edition. It is also interesting to note the increasing recognition of Governmental stakeholders and policy debates as central, with less of a dominant role for commercial sectors among the papers. This does not discount the commercial sectors importance, but does highlight that Information Systems has much to learn and contribute away from the commercial world. Hokwon Song's opinion piece in particular highlights how an unusual, little studied, and often disregarded area (in Song's case modern churches in the US) can provide startling points of debate for our field. Information systems should not simply be servants of the powerful elite (Baritz, 1960) of commercial organisations in financial services and consulting, but also include research and consideration of industries and sectors of society often overlooked. If we are to, as Claribelle Guanco's article requests, bridge the perceived "relevance gap" (Starkey & Madan, 2001) in management research then we must ensure that we ask the question "relevant for whom?", ensuring that all in our world are represented. I would be keen to see such areas reflected in future issues of the iSChannel.

Dr Will Venters, Faculty Editor.

Baritz, L. (1960) *Servants of power*. Wesleyan University Press, Middletown.

Starkey, K. and Madan, P. (2001) Bridging the relevance gap: Aligning stakeholders in the future of management research. *British Journal of Management* 12 (Supplement 1), S3-S24.

Welcome to the Second Edition of iSChannel

Last year we had an abstract idea take shape into a laudable student journal, it was produced and edited by none other than the students of the Department of Information Systems. This year we renew the vision set by our predecessors. While the first edition of the iSChannel was our benchmark, with our second edition we hope to provide a journal of superior quality that showcases the plethora of academic work and opinions from the LSE students.

It comes as no surprise that this journal is the outcome of hours of handwork. The board of editors worked consistently with the reviewers and faculty editor who despite busy schedules always contributed their time and effort. We especially would like to thank our reviewer Charles Abdul Wahab for his commendable enthusiasm and support during the reviewing process. There have been trying times when feelings of camaraderie have transformed into feelings of chaos but now we take great pride in presenting to you the second edition of the iSChannel.

The second edition of the journal encompasses an interesting collection of student academic work ranging from traditional topics to the more recent issues in the limelight such as biometrics. We start our edition with an article by Claribelle Guanco, who discusses the issue of the gap between Information Systems research and practice. A piece by Mohammad Wasif Ali uses a risk categorization framework to identify the causes of IT project escalation. Ganni Tulusan evaluates various models and theories within the healthcare sector. The next two articles explore Information Systems Development: Gurpal Sohal covers user involvement in systems development while Werner Keplinger draws attention towards agility in Information Systems.

Articles on e-government by Jakob Hesse and on Civil Society organizations by Holly Peterson focus on the popular arena of Information Systems within the public sector. We conclude our publication with the opinion section. Divya Titus in her article about biometrics poses a question of whether this ground breaking technology is affecting humankind's basic right to privacy. On an unusual note we have an opinion piece by Hokwon Song who sheds light on the growing influence of technology on modern churches.

Once again we would like to thank everyone who helped us produce the second edition and we hope that you will enjoy reading it as much as we enjoyed working on it!

The Editorial Board

Mind the Gap: A Critical Review of the Information Systems Research and Practice Relationship

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The gap between information systems research and practice has been widely recognized and observed. The exchange of knowledge and resources between IS research and practice are facilitated by mechanisms such as IS publications, education, funding organisations and conferences. Using the literature from the reflections of IS academics and practitioners on the research relevance debates and empirical papers, each mechanism is discussed in detail to identify where the gap occurs. Suggestions and some positive developments have been put forward to bridge the gap. However, the longstanding debates in the identity, status and value of IS research remains to be a structural challenge in building this bridge. No easy solutions are offered, nor are there any immediate ones in sight. This paper concludes with some important caveats and suggestions for future research.

Introduction

Information systems (IS) can be defined as “an *instantiation* of information technology” (Lee, 1999a) “embedded in a complex web of social norms and practices” (Hirschheim & Klein, 2004). This definition underlines the social and technological aspects in the study and practice of IS.

IS research and IS practice cannot be divorced for “[w]ithout MIS¹ as a profession or corporate function, there would be no *raison d’être* for MIS research” (Lee, 1999a). The use and application of information technology in the organizational context is one of the motivations that has given rise to the study of IS (Avgerou & Cornford, 1998; Khazanchi & Munkvold, 2001). A “symbiotic relationship” between IS research and practice (Benbasat & Zmud, 1999) is most desirable, where both inform and impact the other (Galliers, 1997).

The gap between IS research and practice has been long recognized (Farhoomand, 1987; Grover & Sabharwal, 1989; Sjazna, 1994; Pearson et al, 2005). This gap has manifested itself in many forms—in the lack of relevance in IS research (e.g. Benbasat & Zmud, 1999; Westfall, 1999), in the disconnect between university education and industry requirements (Lippert & Anandarajan, 2004; Beckman et al, 1997), in the divergent interests of IS researchers and practitioners (e.g. Gosain et al, 1997), in the lack of communication, collaboration and shared goals between them (Desouza et al, 2006; Glass, 2001; Moody, 2000), in the difficulty of accessing each other’s resources and in the social, institutional and political complexities of disseminating research to practice (Nevill & Wood-Harper, 2001).

Evidence of this gap can be found in the literature of unresolved IS debates and the critical reflections of IS researchers in the relevance of their work to practice. This paper focuses on the mechanisms that connect, or disconnect, the exchange of knowledge and resources between the two constituencies. Its aim is to engage the reader to raise more questions than offer answers in order to have a greater appreciation on the developments of the IS field.

The IS research-practice relationship

The goal of IS research cannot be removed from its source—the practice which it intends to support. Its goal is to encourage thinking, widen knowledge (Pearson et al, 2005), and

more importantly to impact practice (Orlikowski & Baroudi, 1991). Galliers (1997) and Moody (2000) described what the research-practice relationship ought to be against what actually happens (see Figure 1 and 2). Ideally, research is informed by problems in practice. Research findings are disseminated and applied to improve practice. IS research could emulate studies in medicine, law or business finance which enjoy a tightly coupled relationship with practice (Moody, 2000; Davenport & Markus, 1999; Banville & Landry, 1989).

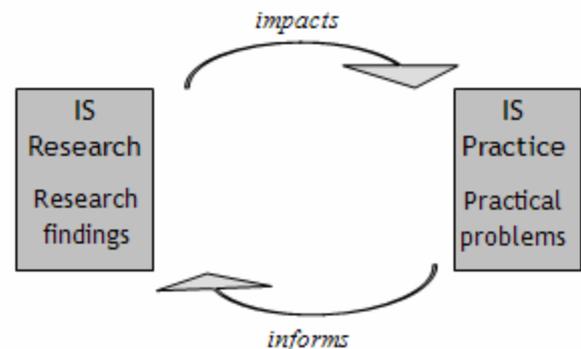


Figure 1: The ideal IS research-practice relationship (adapted from Galliers, 1997 and Moody, 2000)

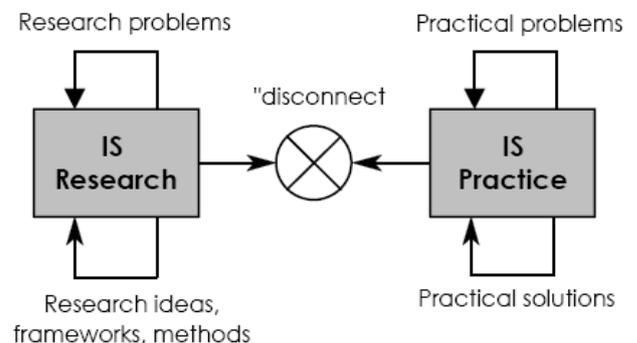


Figure 2: What actually happens: the gap between research and practice (taken from Moody, 2000)

In reality, however, IS research and practice form self-referential silos or two quite separate worlds (Galliers, 1997). The ‘disconnect’ occurs when problems and solutions are disseminated within their own communities with “little over-

¹MIS is a commonly used term in the US. For the purpose of consistency, this paper uses the term IS.

lap or knowledge transfer between them” (Moody, 2000). For example, practitioners rarely follow techniques and methodologies prescribed by research in information systems development (Bansler & Bødker, 1993; Fitzgerald, 1997; Lang and Barry, 1997).

The diagrams above assume a linear and functional relationship between IS research and practice. But the socio-technical nature of the study of IS means that research and practice are embedded in the social context. They exist in a complex web of social institutions, mechanisms and stakeholders— “the web of researching” (Lee, 1999a). Nevill and Wood-Harper (2001) expounds on this perspective. Based on their interpretive research and the responses of 35 IS academic leaders in the UK, they outline the resource-dependency relationships in IS research and the various stakeholders involved (Figure 3). They argue that socio-political influences and limited resources affect the choice, intended audience and relevance of IS research. They mention role of publications, funding organisations, education and conferences in disseminating research to practice and facilitating exchange of knowledge and resource. In the next section, we take a closer look at each of these mechanisms to identify the disconnections between IS research and practice.

Mechanisms of (dis) connection

(1) Publications

Publications such as journals, the “lifeblood of all academic professions” (Gray et al, 2004), are important mechanisms in diffusing and communicating knowledge from research to practice (Sjazna, 1994; Gosain et al, 1997; Nevill & Wood-Harper, 2001). IS practitioners are most interested in publications that address their critical concerns (Sjazna, 1994; Benbasat & Zmud, 1999). To be effective mechanisms, publications should be relevant, readable, timely and accessible (Benbasat & Zmud, 1999; Robey & Markus, 1999; Pearson et al, 2005; Desouza et al, 2006).

The question of whether IS research pursued and published is relevant to practice comes to the fore. The rigor versus relevance debates hit a ‘raw nerve’ among academics (Gray, 2001) as evident in a number of IS journals special issues, conference discussions and empirical studies (see Table 1). Rigor and relevance are not mutually exclusive goals of research (Applegate, 1999) but the debates suggest that the pendulum has swung far to the pursuit of excessive rigor at the expense of being relevant to the IS practice it intends to support (Moody, 2000). Many academics contend that long-standing emphasis in publishing rigorous research has created a gap with its intended audience—the IS practitioners. A recent survey by Pearson et al. (2005) point out that most IS/IT practitioners do not read, value or apply research because only a few are familiar with IS publications. Darroch and Toleman (2005) interviewed practitioners who expressed dismay over the inaccessibility of IS publications and the time-consuming efforts in searching for the applicable research material. Another compelling evidence is the subscription withdrawal from MIS Quarterly, a top IS journal aimed for academics and practitioners, by the Society of Information Management International, an organization composed of CIOs (Westfall, 1999; Benbasat & Zmud, 1999).

Several periodic analysis of IS journals have revealed that IS research topics diverged from the critical concerns of IS practitioners. Using statistical analysis and mapping to analyse whether the top IS and business journals published between 1984 to 1993 reflected key concerns of IS practitioners, Sjazna (1994) discovered that research converged with practitioners’ concern in the area of IS-business alignment but diverged in the area of software development where it continued to be a pressing concern for practitioners. These findings were echoed in the comparative analysis between academic and practitioner-oriented journals by Gosain et al (1997).

Some practitioners opine that academic publications should be as practical and accessible like the New England Journal of Medicine (Byrne, 1990). However, the ‘publish or perish’

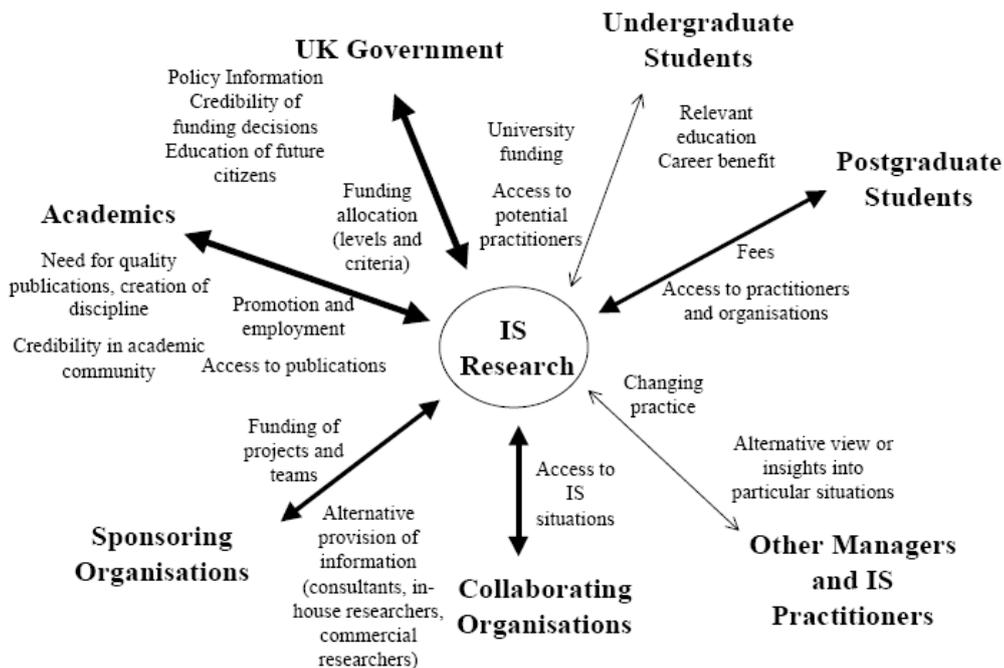


Figure 3: The resource-dependency relationships of stakeholders in IS research (taken from Nevill and Wood-Harper, 2001)

Special Issues of Academic Journals	<ul style="list-style-type: none"> • Information Resources Management Journal 1998: • Saunders, 1998; Robey & Markus, 1998; Senn, 1998; Mandviwalla and Gray, 1998 • Management Information Systems Quarterly (MISQ) 1999: • Applegate, 1999; Benbasat & Zmud, 1999; Lee, 1999b; Lyytinen, 1999; Davenport & Markus, 1999 • Communications of the AIS, Volume 6, 2001
Conferences and Panel Discussions	<ul style="list-style-type: none"> • Grover et al., 1999 • International Conference on Information Systems (ICIS) 2002 conference; Australian Conference on Information Systems (ACIS) 2003 and Pacific-Asia Conference on Information Systems (PACIS) • ICIS 2005 panel (Desouza, El Sawy, Galliers, Loebbecke and Watson, 2006)
Empirical Research	<ul style="list-style-type: none"> • Grover & Sabherwal, 1989 • Sjazna, 1994 • Gosain et al., 1997 • Lippert & Anandarajan, 2004

Table 1: Special issues, conferences and studies on IS research relevance

predicament of many IS academics has lead to publishing as an ends rather than a means for disseminating research (Moody, 2000). IS journals have become mechanisms of promotion for academics rather than communication to practitioners. The institutionalized university reward systems impose that recognition, promotion and tenure will be granted to IS researchers whose work is published in the top IS journals (Westfall, 1999; Jennex, 2001). To illustrate, Avison et al (2006) notes that the Research Assessment Exercise (RAE) in the UK evaluates universities according to their research published in top IS journals listing. They argue that the excessive fixation in publishing has caused the decline of high quality books and monographs. Insights from their interview of UK IS academics reveal that achieving credibility, career promotion and fulfilling RAE requirements have become the purpose of publishing since ‘papers produced for practitioners don’t usually count’ (Nevill & Wood-Harper, 2001). These institutional pressures combined with the lengthy, and often political, journal reviews (Gray et al, 2004), the lack of accessibility and availability of research (Desouza et al, 2006), and the time constraints and problem of information overload faced by practitioners (Darroch & Toleman, 2006) weakens the effectiveness of IS publications in bridging research and practice.

(2) Education

Education received by students, the main audience of research, is another linking mechanism between IS research and practice (Nevill & Wood-Harper, 2001). Students, the would-be practitioners, are conduits in transferring the knowledge and skills they acquired in their education (Ellis et al, 2003; Pearson et al, 2005). Academics play an important role in imparting their knowledge and research findings to students (Lee, 1999b). Textbooks are an important medium for disseminating academic research (Olfman, 2001). The IS curriculum should therefore reflect current practice (Avison & Fitzgerald, 2001), expose students to both rigorous and relevant research (Pearson et al, 2005) and prepare them to work in the industry (Lippert & Anandarajan, 2004).

However, the divergent interests of academics and practitioners results to a “disconnect between university offerings and organizational necessities” (Lippert & Anandarajan, 2004). In software engineering education, for example, graduates are not equipped with requirements of the industry (Beckman et al, 1997; Coulter & Dammann, 1994). The slow effects of IS research in the curriculum (Moody, 2000) and the lengthy publication process of textbooks results to teaching that is outdated and lagging behind practice (Lyytinen, 1999). The increasing demand for competent IS graduates provides a high motivation for IS education to explore alternative avenues to connect to practice—cross-disciplinary programmes, distance education, industry centers (Larsen & Levine, 2005), sabbaticals and faculty internships in companies (Kohli, 2001; Khazanchi & Munkvold, 2001), joint university-industry careers (Moody, 2000) and collaborative partnerships such as the Carnegie-Mellon Software Engineering Institute (Ellis et al, 2002) or the University of Queensland and Boeing partnership (Carrington et al, 2005).

(3) Funding organisations

Research is made possible through the financial support of funding organisations, the third mechanism. Sources for funding could be internal i.e. from the limited university budget, or external i.e. from government grants or Research Councils, charities, industry sponsors or through consultancy (Arnott et al, 2005; Nevill & Wood-Harper, 2001). To quote Loebbecke in Desouza et al (2006), sponsors are the major stakeholders in research. Through industry sponsorship, IS research gains access to practical problems and the financial resources to carry out their relevant research aimed to impact practice.

The exchange of resources and access between the two communities has weakened and the gap between them has become more evident because of the perception that IS research lacks relevance to practice (Hirscheim and Klein, 2004). Acquiring external funding is competitive and dependent on the researcher’s credibility, personal networks, and other stakeholders such as the government and the RAE whose evalua-

tion weighs heavy in obtaining favorable funding decisions (Nevill & Wood-Harper, 2001). An analysis of the research literature to investigate the funding sources for decision support systems (DSS) research by Arnott et al (2005) provide empirical evidence on the IS research-practice gap. First, the significantly low percentage of industry-funded DSS research attests to the dwindling confidence in the relevance of research. Second, topics that were dominant in practice received little research grants. This confirms that research remains divergent from the concerns of practice. Third, positivist research papers, primarily published in top US journals and almost never in the major European journals, received the bulk of industry funded grants. Research methods are influenced by funding policies and positivism remains as the dominant approach (Orlikowski & Baroudi, 1991; Chen & Hirscheim, 2001). Since sponsors favor positivistic research, academics who pursue alternatives such as interpretivism (Walsham, 2006), action research (Baskerville & Myers, 2004) or multimethodology (Mingers, 2001) are in a tight spot. IS researchers recognize the shortcomings of positivism (Orlikowski & Baroudi, 1991; Benbasat & Zmud, 1999; Bacon & Fitzgerald, 2001) but they need funding to pursue these alternatives.

However, the perception that IS research is not relevant may only be partially true. Loebbecke points out that relevant IS research is not published because its value is derived from the confidentiality and exclusivity of research findings for utilization of the sponsoring organization (Desouza et al, 2006).

(4) Conferences

Conferences are mechanisms for networking, discussing ideas and dissemination of research (Davis, 1987; Nevill & Wood-Harper, 2001). For example, the Pacific Asia Conference on Information Systems has been instrumental to the establishment and development of IS research in Asia (Chau et al, 2005). The IFIP TC8/WG8.2 working conference in 2001 was particularly aimed to realign research and practice (Russo et al, 2001). However, these networking activities have been limited within the boundaries of each community, instead of facilitating an exchange. IS researchers and practitioners hold separate conferences with little cross-participation and representation (Moody, 2000). IS conferences discusses topics that are already passé (Glass, 2001). Moreover, the pressure to publish in top IS journals, has a knock-down effect in diminishing the variety and quality of submitted conference papers (Avison et al, 2006).

Bridging the gap?

Academics did not stop short with explanations of the IS research-practice gap. Their reflections have called for changes in the status quo. Journal editors are challenged to shorten review times and to be 'facilitators' rather than 'gatekeepers' by encouraging pragmatic and relevant research (Benbasat & Zmud, 1999; Chen & Hirscheim, 2004). Pearson et al. (2005) suggested guidelines to increase research relevance research to practitioners—(1) choose topics interesting to practitioners via partnerships with them; (2) write in a readable language and style; (3) offer usable research findings; (4) increase timeliness of publications through shortened lead times; (5) a paradigm shift to esteem academics who publish in practitioner journals; (6) publish in targeted journals or magazines that practitioners read; (7) increase access to published research. The re-evaluation and expansion of the 'top' IS jour-

nals ranking list (Avison et al, 2006), the increase of online visibility and availability of more journals (Chen & Hirscheim, 2004; Gray et al, 2004) and the inclusion of publications in practitioner journals as criteria for promotion (Westfall, 1999; Jennex, 2001) are significant changes that could result to increased relevance and disseminating capacity of IS publications. Adopting an open resource research approach where researchers and practitioners with the same interest can openly communicate, freely conduct peer reviews, collaborate in agenda-setting can better facilitate dissemination of research whilst in its development stage (Hardaway, 2005).

The IS curriculum could be amended to include hands-on experience and teaching of current technologies such as the Enterprise Resource Planning systems (Watson & Schneider, 1999). Collaborative university-industry initiatives such as the Working Group on Software Engineering Education and Training (Ellis et al, 2002) are positive efforts in of universities re-educating practitioners to competent software engineers. MSIS 2006 (Gorgone et al, 2006), the fourth collaborative effort by ACM and AIS, is an example of a model IS curriculum for graduate level that has been updated to accommodate changes in the industry. Watson and Huber's (2000) paper contained innovative programs employed by various IS academics to establish a closer partnership with practice. Close interaction with practitioners will ensure that research remains relevant to attract greater funding whilst practice is guaranteed a supply of competent problem-solvers (Watson & Huber, 2000).

Structural problems

Though intended to connect IS research and practice, each of the mechanisms discussed above seem to be unsuccessful. Nevertheless, to conclude that IS research-practice gap exists because of the ineffectiveness of the linking mechanisms is quite myopic. Building and preserving a bridge on shifting foundations is problematic. The same analogy applies to the IS field whose foundations are built on longstanding debates about its identity, status and value (Banville & Landry, 1989; Orlikowski & Iacono, 2001; Avison, 2003; Benbasat & Zmud, 2003; Larsen & Levine, 2005) and whose 'empirical referent is itself always in a state of change' (Lee, 1999a).

The fragmented nature of the IS field, its lack of cumulative tradition and coherent themes (Swanson & Ramiller, 1993; Bacon & Fitzgerald, 2001; Larsen & Levine, 2005) have resulted to a body of knowledge that is similarly disjointed and heterogeneous. Furthermore, the multiplicity of theoretical paradigms, epistemological approaches, and research methods (Orlikowski & Baroudi, 1991; Avison & Fitzgerald, 2001; Chen & Hirscheim, 2001) not only leads to different ways of researching the same thing, but also makes understanding research a daunting and complicated task for the IS practitioner. Wixon (2003) argues that the evaluation of IS research methods is irrelevant to practitioners and that the case study approach produces the most practical and usable research findings. Alternatives to the dominant positivist methods such as reflection-in-action (Heiskanen & Newman, 1997) and action research methods (Baskerville & Myers, 2004) are aimed to bridge the gap between research and practice. These similar methods encourage practitioners to be active whilst situated researchers develop practice-oriented theory.

Conclusion and caveats

The IS research-practice relationship is influenced by social, political and institutional complexities which affect the mechanisms that operate between them. The four mechanisms discussed above are not exhaustive or treated extensively; the limited space of this paper does not allow for such. The goal of research has been explicitly limited to its relation to practice. While this was intentionally restrictive, it is equally important to remember that although research and practice have overlapping interests to work with each other, they do not operate with the same goals. Beyond rigor and relevance, IS research has a greater responsibility of tackling societal problems and improving the way of life (Lee, 1999b; Desouza et al, 2006). Thus far, the implied meaning of 'practice' in the literature has been limited and equated to the industry. Future studies could re-examine the domain and definition of IS practice, explore innovative mechanisms of knowledge transfer and report on the positive actions taken to bridge, not just mind, the gap.

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Project escalation and IT management

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Escalation is considered a costly problem that occurs frequently in IT projects. Project escalation has been a major issue in academic research for several decades. According to the relevant literature, the factors that contribute to escalation can be mainly categorised into tangible and intangible; more specifically, project and organizational factors are seen as tangible risks that can hinder project success. A brief overview of a risk categorization framework is presented here for its validity in identifying project escalation factors. In contrast, the IS literature deals primarily with intangible factors, as it provides a solid theoretical base for understanding escalation as a social phenomenon. Within this context, four prominent theories (self-justification theory, prospect theory, agency theory and approach avoidance theory) are discussed and contrasted for their relative applicability for explaining escalation of commitment. Moreover, escalation is reviewed as a phenomenon and suggestions for further research are also presented (for example, certain considerations on de-escalation).

Introduction

The extensive literature available on project escalation in the Information Systems (IS) field clearly indicates that it is a well documented and costly problem. However, what is concerning is that this problem is certainly not uncommon. Alarming findings from the Standish group's (2003) survey indicates that 43% of software projects were over budget and 54% had time overruns (Pan *et al.* 2006). Through their lifetime, these projects continue to absorb scarce resources (time and money) while failing to deliver any real value to the organization. According to Mahrng (1998) successful IT project management requires specific competences and various other prerequisites that in several ways differ from those required for managing an ongoing business. It is a skilful and complex task that demands the successful alignment of both technical and social systems that are operational within an organization (Keil *et al.* 1998, Leitheiser 1992).

The issue of IT project management failure has enticed both practitioners and academics alike for several decades. The phenomenon of '*escalation of commitment*' to IT projects has attracted much attention in recent years (Keil 1995, Mahrng and Keil 2003). Keil and others describe escalation as a situation where decision makers continue to invest resources into a course of action that is not producing the desired result (Keil and Robey 2001, Pan *et al.* 2006). Other researchers suggest that managers continue to do so when they are faced by uncertainty of goal attainment as a cause of negative feedback relating to previous resource allocations (Brockner 1992, Keil 1995).

The majority of literature on escalation is comprised of works from both management and IT/IS journals. The literature from management journals predominantly adopts a critical perspective of IT management and considers the organizational factors involved. On the other hand, literature found in IT/IS journals adopt an explanatory perspective, by providing a set of theoretical tools for understanding the phenomenon. As an overall result, the literature forms a bilateral view of escalation, from an organizational (tangible), as well as a social (intangible) perspective.

Another useful way of categorising the literature is by using

the Burrell and Morgan social paradigms framework. The two different approaches found in the literature (tangible and intangible) fall into the 'functionalist' and the 'interpretivist' paradigms, respectively. Literature in management journals takes a functionalist view, as it tries to formalise project management and thus develop best practices. Whereas the majority of literature in IS/IT journals is highly interpretive (Burrell and Morgan 1979). However, the main focus of this paper will be to consider the latter, looking at the theories considered in the IS field.

Escalation of commitment

While any type of project is at risk of escalation of commitment, Montealegre and Keil (2000) proclaim IT projects are especially vulnerable to this phenomenon. Software by nature is intangible, thus making it difficult to determine accurate estimates of the quantity of work completed. Consequently managers continue to invest resources without having any bearing of where the project is headed.

The aforementioned literature suggests that there is a positive correlation between project complexity and project escalation of commitment (Brock *et al.* 2003, Glass 1997, Montealegre and Keil 2000). Complexity factors can be defined as inherent risks that can hinder project success. These complexity factors may include: absence of a clear vision and statement of requirements, size (resources required to complete the project), lack of stakeholder involvement, unrealistic expectations due to estimating difficulties and organisational politics and a lack of strategic focus.

Practitioners and academics who advocate IT project risk management recommend that by mitigating these risks to success, the frequency of project failure can be reduced (Keil *et al.* 1998). Extensive research is underway to establish a framework for identifying these project risks. One key example is a Delphi study that presents a categorisation of the main risk factors identified by project managers into a 2x2 grid (Keil *et al.* 1998). The grid is constructed under two dimensions: (1) '*perceived importance*' of a particular factor in relation to the other risk factors identified; (2) '*perceived level of control*' representing the degree to which the project managers believed they could prevent the risk from arising; see

(Figure 1).

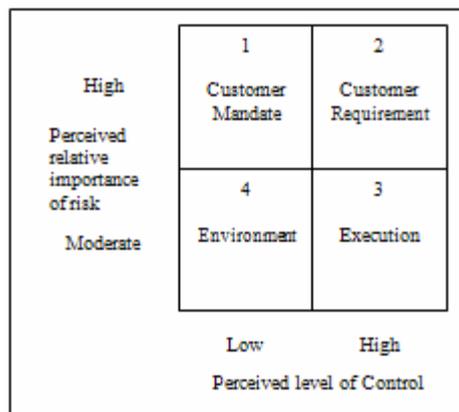


Figure 1 A risk categorization framework (Keil *et al.* 1998)

Theories to explain Escalation behaviour

The discussion of the various theories to explain escalation of commitment dates back over four decades. While some have gained much support and stood the test of time others have been quick to be dismantled and rejected by the majority (Brockner 1992). This has generated a great deal of controversy with relation to the integrity of some of the theories put forward. The end result falls into three categories. First, some theories have been extended and adapted; second, new theories have been offered as replacements and finally some have been put forward as supplementary to each other. However, four theories are clearly distinguishable in respect to the extent they are cited and their application in empirical research (Keil *et al.* 2000).

Self-Justification Theory (SJT)

According to Keil and others (2000) '*self justification theory posits that individuals tend to escalate their commitment to a course of action (and risk unpredictable outcomes) in order to self justify prior behaviour*' (Keil *et al.* 2000, Staw and Ross 1987). The central construct to self-justification theory is based on the theory of cognitive dissonance put forward in the 1960s by Festinger (1957). Self-justification theory asserts that individuals will try to justify prior erroneous decisions by rationalising them against a perceived error in judgement so that future decisions are grounded in a '*retrospective rationality*'. Henceforth prior losses or costs incurred are considered relevant for making decisions in the future (Keil *et al.* 2000, Staw and Ross 1987). This creates a paradoxical status quo at every decision making round because the need to justify prior decisions encourages further resource commitment. Moreover, according to a role playing study carried out found that personal responsibility plays a central role in the notion of psychological self-justification (Staw 1976). Findings from the study concluded that those individuals with a high level of responsibility for previous decisions are more likely to find a greater need to justify the previous decisions they have made.

Since its first proposal in the mid 1970s, numerous publications have either extended or invoked self-justification theory to explain and understand escalating commitment. However, later studies carried out to replicate Staw's classic example failed to find escalation. Therefore in recent years research has advanced to explore alternate or "supplements" to explain

the phenomenon (Brockner 1992). Brockner (1992) suggests that although self-justification theory proves to be both a good starting point and explains a significant portion of escalation behaviour, its theoretical base is more coherent when considered in conjunction with other escalation behavioural theories.

Prospect Theory (PT)

Whyte (1986) contrasts prospect theory with self-justification theory and suggests that it better serves as a replacement for explaining escalating commitment (Keil *et al.* 2000). Prospect theory explains decision makers' risk taking propensities when faced by uncertainty. The underlying construct is that individuals whom have not accepted previous decisions as being wrong will exhibit risk seeking behaviour. Consequently they will continue to follow a failing course of action. Moreover, they are more likely to practice risk seeking behaviour when posed with two negative alternatives (Keil *et al.* 2000, Whyte 1986). The decision maker will thus have to either choose to abandon and accept the definitive loss of the initial investment or continue with their chosen course of action and risk a possibly larger loss in quest of goal attainment.

The results from Garland and Newport (1991) laboratory experiments support the prospect theory interpretation of escalation. The participants were said to exhibit the so called '*sunk cost effect*' in which they continued to invest resources into a failing course of action in pursuit of goal attainment (Keil *et al.* 2000). Considering this, it can be legitimately argued that prospect theory explains the retrospective decision making process decision makers' exhibit in self-justification theory; whereby, the decision maker justifies to him/herself that previous decisions were correct (not coming to term with an earlier loss) and continues to invest resources in the hope of success. Therefore by adopting this perspective it can be said that prospect theory facilitates a more coherent understanding of self-justification theory rather than replacing it (Brockner 1992).

Agency Theory (AT)

The underlying concept of an agency relationship can be best defined as a 'contractual agreement'. This relationship arises when one individual (the principal) engages another individual (the agent) to perform some activity on their behalf. Also, this often involves delegating some responsibility and autonomy to the agent (Jensen and Meckling 1976, Keil *et al.* 2000). Central to this concept is the notion of '*goal incongruence*'; in this situation, an agent will act in a way that will maximise their utility or safeguard their interests, rather than follow a path that maximises the best interests of the principal. Also the concept of '*information asymmetry*' is said to be central to all principal-agent relationships. The concept postulates that the agent possesses some private information that the principal cannot access without a cost and as a result encourages self interested behaviour.

Findings from Harrison and Harrell (1994) lab experiments support the agency theory interpretation of escalation. In the experiment subjects were made to believe they had knowledge of some private information which was not available to their superiors. The result was that the subjects continued with questionable projects, in the hope to safeguard their reputations (Keil *et al.* 2000). Moreover, according to Keil *et al.* (2000) agency theory does particularly well to explain es-

calation within a software management context as noted before. The inherent risks in software projects make them very difficult to monitor and control. Therefore, it is possible for agents to conceal the status of a software project from their superiors and allow it to escalate. This approach also suggests why some software projects suffer from the '90% syndrome' – where the project is reported to attain 90% successful completion in a short period of time relative to how long it takes to complete the remaining 10%; hence the true progress of the project is never truly realised and additional resources are continued to be committed by agents for project completion (Abdel-Hamid 1988)

Approach Avoidance Theory (AAT)

Approach avoidance can best be conceptualised as a 'behaviour that results when driving forces that encourage persistence seem to outweigh restraining forces that encourage abandonment' (Keil *et al.* 2000). These driving forces can include: (1) the size of the reward; (2) the cost of withdrawal (sunk cost effect); and (3) proximity to goal attainment (completion effect). Consequently these competing forces create inconsistencies in the decision maker's rationale for abandoning a failing course of action.

Proximity to goal attainment or the *completion effect* is a key tenet of approach avoidance theory. The concept suggests that a decision maker is more likely to commit to a particular course of action depending on how close they feel they are from goal attainment. The closer the person feels they are to completion of a specific course of action the less likely they are to abandon it. The aforementioned *90% syndrome* serves as a good example to explain the concept.

Results from a series of experiments carried out by Conlon and Garland (1993) uphold the goal proximity theory of approach avoidance. However, they argue that the *sunk cost effect* may in fact be invoked from within 'proximity to goal attainment' and the two should not be considered as the same. In other words goal proximity is a 'pulling' force on the decision maker because of the possible rewards in the future. Conversely the cost of withdrawal act as a 'pushing' force for goal attainment (Keil *et al.* 2000). Later works by Mann (2003) suggest that the approach avoidance rationale could serve as a foundation to bring several other theories into one over-arching model to understand escalation. Pan and others (2006) support this suggestion and propose that approach avoidance captures the essence of complex escalation situations that often comprise both push and pull factors. Where self-justification theory serves to better understand the pull; and agency or prospect theories explain the push factors that encourage escalation of commitment.

De-escalation- the way forward

While escalation attempts to understand why individuals adhere to a failing course of action, de-escalation tries to examine how they may extricate themselves from it (Pan *et al.* 2006). De-escalation of commitment can be defined as the process that leads to a reduction in commitment and the enactment of redirection away from a previous decision (Montealegre and Keil 2000). According to Keil and others there is relatively limited empirical research available on de-escalation of commitment (Keil and Robey 1999, Montealegre and Keil 2000, Pan *et al.* 2006). However, recently the focus of research has been and is changing more towards de-

escalation as a model and its practical implications in practice (Keil 1995, Keil and Robey 1999, Ling Pan *et al.* 2005, Montealegre and Keil 2000).

In a study by Keil and Robey (1999) in which they examined the specific actors and the actions needed to de-escalate they found top-management to be the most frequently cited actors that brought about a de-escalation of commitment. Moreover, they found that actors who were not directly involved in projects are the most likely to initiate de-escalation. This is interesting because the lack of involvement from senior management is often cited as a key reason for escalation (Brock *et al.* 2003). Also, it is not surprising that indirect stakeholders are more likely to initiate de-escalation considering the central tenets of self-justification theory. Conversely Keil (1995) suggests a list of implications that managers and organizations can apply to reduce escalation. The overall approach is to set up pre-emptive measures to stop escalation from occurring rather than suggest best practices on the process of de-escalation. He suggests that managers can take measures at an individual level to minimize their own risks. Moreover, they can introduce policies to reduce their organization's exposure to escalation. Both approaches are beneficial because they open new deltas for further research and discussion, paving the way towards a research area where the accumulated knowledge on escalation can be adapted to develop implemental models of de-escalation. For instance Montealegre and Keil (2000) in their study on the Denver International Airport baggage handling system develop a model of the de-escalation process (Pan *et al.* 2006). The model outlines de-escalation as a four phase process: (1) problem recognition; (2) re-examination of prior course of action; (3) search for alternative course of action; and (4) implementing an exit strategy.

Implications, Limitations and Conclusions

One approach to developing a rational model of de-escalation for IT projects can be to adopt a pre-emptive approach as suggested by Parnas and Clements (1986) for software design. By recognising the intrinsic factors involved in software design developers can counteract them by adopting risk mitigating strategies. In other words by accepting these risks one can better prepare for and stop them from happening. Therefore, using the theories and de-escalation models available, practitioners can develop policies to stop escalation from occurring from the outset. As Mahring (1998) points out IT management differs from organisational management in that it demands a strong appreciation of technology in business and technical competence as well as traditional organisational management skills including project management, leadership and organisational control. When considering this, practitioners need to develop a new hybrid management methodology for managing IT projects as is suggested by Markus (2004). In her paper she advocates that it is not sufficient to use managerial methods from both technology and change management for using IT as a driver for change. But instead to adopt a new set of managerial practices altogether, adeptly named 'Technochange' (Markus 2004). Therefore, IT managers need to develop a new set of project management practices that are coherent with software development.

The main aim of the paper has been to provide a concise overview of escalation as a phenomenon and its significance within an IT management context. The main limitation of the

paper is its generalist view and the relatively low level of detail provided for the various factors involved, however a more detailed examination is beyond the scope of the paper. Also, another area which needs to be considered is how escalation is defined by the various stakeholders e.g. users, developers and management as is the nature of escalation it is highly open to different interpretations. However, the approach adopted here was to address the reasoning for escalation rather than to consider its effects. To rid of escalation is a difficult task but one that is not impossible; the theories considered above serve as an excellent starting point to achieve the end goal of reducing escalation of commitment.

Conclusively, all four of the theories considered work to highlight that project escalation is a multi-faceted phenomenon that can be a result of several underlying factors. Through the review of the theories and the examination of the literature on the factors of escalation in the theories, it can be seen that no single theory is able to fully explain escalation. Also the diversity in the perspectives adopted in the theories serves to show that escalation is a highly complex phenomenon. There are a great many issues that need to be considered when trying to prevent escalation; self and project evaluation, resource management, technical competence and many more. The usefulness of each factor is dependent on the situation; therefore it is difficult to fully understand escalation through the use of a single theoretical perspective. Instead the practitioner needs to be aware of these factors and hence be ready to deal with them. However, a key point to note is that this does not necessarily mean that each factor is operational independent of the others. But, instead as the theories considered above show it is often the case that not only do they contribute to a better understanding of the other but they may also be the cause of the other as is the case for self-justification theory and prospect theory. The two together serve to better understand why agents may choose to hide project progress from their principal which is the central cause of escalation as proposed by agency theory. On the other hand, approach avoidance theory encompasses all the other theories in an overarching framework to explain escalation. In the end escalation as a phenomenon requires a holistic consideration of all four theories as a starting point to reducing escalation.

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Perspectives of Success and Failure in Healthcare Information Systems: An Evaluation of Existing Theories and Models

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The phenomena of successful or unsuccessful implementations of healthcare information systems have been widely discussed. In fact, there is very often a dichotomy if the new implemented information and communication technology is a success or failure or even both at the same time. This literature review therefore compares success theories, models and frameworks in the healthcare industry and how these theories are applied in the field to evaluate a healthcare information system implementation. It starts with a discussion of the definition of success (and respectively failure), gives an overview of different schools of thought in the healthcare industry and finally critically compares success theories and models with each other. The outcome shows that the success and failure of a healthcare information system cannot be analysed by only one theory or factor but needs many interrelated and emergent factors.

Introduction

Successful implementation of information and communication technologies (ICT) in complex organisations such as hospitals has been a source of much research and claimed as one of the most challenging and promising research areas (Reinhold, 2006). It is evident that ICT in hospitals offer tremendous opportunities to reduce clinical errors, increase efficiency and improve quality of patient care (Ammenwerth *et al.*, 2003). At the same time, however, many challenges such as complete failures or resistance from practitioners like physicians, clinicians, nurses and clerical staff can have negative effects on the patient focus process, and even loss of life may occur (Fitzgerald & Russo, 2005; Han *et al.*, 2005). Han *et al.* (2005), for instance, identified that the mortality rate of children after an ICT implementation increased from 3.86% to 6.57%.

Most of the literature that analysed these failures, though, either focuses only on specific points supported by one case study or comes up with generic “cookbook” recommendations (Reinhold, 2006). Fundamental points of situation-specific working practices and interrelated societal factors in an emergent environment are seldom specified for each particular ICT case (Heeks, 2005). Therefore, this paper does not come up with guidelines of successful ICT implementations; rather, it tries to analyse how these universal approaches, theories and criteria to analyse success (respectively failure) are presented in the current literature. While focus is on healthcare information systems (HIS) in hospitals, examples from electronic health record (EHR) systems are mainly used to illustrate the nature of this complex environment.

First, different criteria and perspectives of success and failure are outlined, and then different epistemological approaches that have been used in the current literature are presented. The main part critically evaluates and compares theories, models and frameworks through which authors analysed successes and failures of HIS.

Drawing these different theories and models together enables to identify a specific structure or evolution of thought, from technical to socio-technical over emergent organisational and psychophysical and lastly hermeneutic theories could be iden-

tified. This theme shows an evolution of theories and models applied in the current HIS literature to analyse success and failure.

Discussion of success and failure perspectives

The current literature has an ongoing debate about the definition of success or failure and defines success in a multidimensional and elusive nature (Berg, 2000; Berg, 2001). Many criteria to define success such as technical-centred, socio-technical, organisational, economical, level of patient satisfaction and complexity of the medical business process have been stated (Berg, 2001; Reichertz, 2006; Fitzgerald & Russo, 2005; Klecun & Cornford, 2005; Andersson *et al.*, 2002). Berg (2001) outlines that “no simple formulae exists for success”. In turn, for other authors it is obvious that the main goal for a successful HIS implementation is to contribute to patient-centred, high-quality, efficient care (Reinhold, 2006). By contrast, other authors focus on technical criteria, examples of which are to define a technical standard to be able to facilitate integration of data (Hersh, 2002) or only looking at the functions and features of an EHR system itself. This approach, however, mistakenly assumes that medical stakeholders are changing their work habits along a sequenced and defined process defined in a HIS system (Berg, 2000).

Social aspects highlight HIS within their environment and organisations where human players form new user ecology (Ammenwerth *et al.*, 2003). In addition, identification of user psychology and behaviour plays an important part in the socio-technical development process (Reichertz, 2006; Berg, 2001). It may be further argued that multiple decision-makers such as physicians or clinicians with different subjective interests and backgrounds play an important role for the system’s success, since one group can view the system as a success, while the other simultaneously views it as a failure (Fitzgerald & Russo, 2005; Elbdabi & Paul, 2002). For instance, an EHR system implementation is successful for specialists since they can directly get the structured patient data from the database, while for physicians the system is too rigid to capture the essence of a patient’s visit and has been neglected (Berg, 2001). Organisational approaches, on the con-

trary, emphasise implementing systems in the whole organisation and design systems that support the process flow in the complex medical environment (Andersson *et al.*, 2002). Berg (2001), however, contradicts this opinion since organisational implementations demand a wider span of implementing the system, apparently making it much more complex and difficult to achieve success (Berg, 2001).

As a consequence, in drawing these different viewpoints together it is not only difficult to measure success but also to define success. “*It is not clear how to measure the success or benefits of a system, or even what ‘success’ really means, or for whom*” (Klecun & Cornford, 2005, p 230). Heeks mentions the various perspectives of failure, “*one person’s failure may be another’s success*” (Heeks, 2005, p 126). Saleem *et al.* (2006) in their empirical studies, though, define specific success criteria such as user satisfaction, user attitudes, and perceived system quality and system usage. Berg (2001) provides an even more complex criterion: the dynamic success, meaning that the success of an HIS changes over time, especially when stakeholders start using the system and change their view of a successful implementation (Berg, 2001; Lapointe, 2005). Furthermore, the organisation and HIS transform to each other during the implementation process (Berg, 2001).

From these positions, we can conclude that this interrelation between HIS’s technical functions, work habits of various stakeholders and emergent organisational aspects makes it difficult to define success only by a single factor. Rather, it must be defined by many interrelated and emergent factors, such as socio-technical, individual opinions of stakeholders and economical etc. (Berg, 1999; Berg, 2001).

Epistemological approaches

In health informatics, a discrepancy to apply a rational functionalist or rather interpretative approach to evaluate success is still evident (Klecun & Cornford, 2005). The central question concerns whether this is due to the methodological insufficiencies or rather to the complexity of measuring improvements of the quality of patient care with various stakeholders involved in a medical process (Ammenwerth *et al.*, 2003). An innate organisational resistance to evaluation and to publicise and measure failures have been identified by Ammenwerth *et al.* (2003). Consequently, to apply the appropriate approach can be a cumbersome task even before the analysis of a specific case has started.

A majority of authors explore the issue of HIS from an interpretative point of view and use case studies, such as electronic health records system implementations, to gain a deep understanding of the administrative rationalities. The complex and unique medical environment, however, makes it difficult to analyse and compare many cases, and it is difficult to legitimately generalise conclusions or even define generic guidelines (Heeks, 2005). Ammenwerth *et al.* (2003) also highlight that the quality of evaluation studies should further improve. Walsh (2004), for instance, uses only one case study to analyse the complexity of capturing relevant data from patients for an electronic patient care system. Since every patient is a unique case it is a very complex task to define a system capable of capturing all relevant data from only one case study (Walsh, 2004). In addition, many case studies refer only to pilot projects, short-term outcomes and efficacy rather than effectiveness have been evaluated (Heeks, 2005).

Furthermore, to get a better understanding of the multiple decision-makers in hospitals, semi-structured interviews followed by an interpretative analysis are conducted in all identified case studies (Heeks, 2005; Reinhold, 2006; Moser & Law, 2006; Walsh, 2004). Ammenwerth *et al.* (2003) underline that “*stakeholders often have different conceptions and views of successful information technology*”. Hence, while semi-structured interviews depend on adequate methods and questions, many studies try to integrate different views and questions. These different views and questions lead to a complex study with changes to questions frequently occurring during the evaluation (Ammenwerth *et al.*, 2003). To analyse intangible effects of improvements in quality of patient care is another obstacle since it is difficult to relate these with such things as having a better structure in a patient care records (Reinhold, 2006).

Positivistic approaches to measures quality of patient care improvements or impact of EHR systems implementations have not been found very often. Rather in tangible rationalities such as systems usage, measurement of the skill set of stakeholders or economical rationalities such as cost and benefit analysis (Saleem *et al.*, 2006). These tangible benefits are easier to quantify, but they do not represent a complete picture of the impact of HIS and should be complemented with other interpretative methods such as semi-structured interview techniques (Ammenwerth *et al.*, 2003). Furthermore, the call for analysing organisational impacts and process changes demands the interpretative rather than the formalist school of thought (Klecun & Cornford, 2005). Nevertheless, due to the limited time and focus of EHR systems, it could be that other important positivistic approaches were omitted.

Critical evaluation of theories and models used to analyse success and failure

This chapter evaluates current theories and frameworks that are used by authors to analyse perspectives of success and failure. Many authors, however, did not use any theory to analyse their case studies and only identified interpretative recommendations. The credibility of these articles should be questioned and therefore are not included in this analysis.

The focus in the 70s and early-80s to analyse HIS on only technical aspects has been overcome after many HIS implementations failed. For instance, it was not only important to define how a technical artefact captures data in an EHR system but also to assign a meaning in the emergent interaction between practitioners and patients (Berg, 2000; Berg 2001). Recent theories go far beyond technical rationales and analyse success in multilevel aspects such as organisational, socio-technical and process-based. Theories that focus on these success criteria are classified in the table (see Table 1) and critically compared with each other.

Socio-technical theory (see Table 1) has been one of the first to analyse the social aspect; however, it usually only focuses on social and technical aspects to enhance job satisfaction (Berg, 1999; Andersson *et al.*, 2002; Reinhold, 2006). Berg (2001) enhances this theory with specific success criteria defined as three interrelated myths - technical, socio-technical and organisational/architectural myths - which are important for a successful HIS. Especially, the organisational criteria show the complexity of healthcare business processes and that change management theories must be applied for a suc-

Theory / Model / Framework	Success Criteria
Socio-Technical	<ol style="list-style-type: none"> 1. Technical 2. Socio-technical 3. Organisational
Theory of Reality Gap (ITPOSMO Model)	ITPOSMO criteria: <ol style="list-style-type: none"> 1. Information, 2. Technology, 3. Processes, 4. Objective and values, 5. Staffing and skills, 6. Management systems and structures, 7. Other resources
<ol style="list-style-type: none"> 1. Actor Network Theory 2. Exchange Framework 3. Mutli-Perspective Psychophysiology Methodology 	<ol style="list-style-type: none"> 1. Sociotechnical (without a hyphen) 2. Social and political within an interwoven emergent environment
Evaluation Programme	<ol style="list-style-type: none"> 1. Social 2. Political 3. Historical 4. Hermeneutic
Discret Event Simulation	<ol style="list-style-type: none"> 1. Socio-technical 2. Stakeholder satisfaction 3. Quality of model/simulation

Table 1: Theories, Models and Frameworks classification

successful implementation. However Berg (2001) does not explain these theories further and also does not present any theoretical framework to support and interlink his myths. Heeks (2005) and Andersson *et al.* (2002), on the other hand, analyse the topic with a well grounded model: the reality gap model (see Table 1). This model not only looks at the three success criteria defined by Berg (2001) but also includes further aspects that are important for the topic at hand. In particular, the objective/values and staffing/skills criteria are distinct since it is crucial to have a detailed understanding of the skill set of various stakeholders, culture and political environment. The strength of this model is to analyse the gap of the initial situation with the outcome defined by many success criteria with an emergent and improvising approach (Heeks, 2005; Berg, 1999).

Fitzgerald & Russo (2005), Moser (2006), Berg (2000) and Berg (1999) evaluate further IS theories that go far beyond technical aspects and specifically analyse sociotechnical (without a hyphen) and political aspects within an interwoven emergent environment. Actor Network Theory (ANT), Exchange Framework and Mutli-perspective Psychophysiology Methodology analyse and reflect actors within their environment or network (see Table 1). Fitzgerald & Russo (2005), however, only use Sauer’s exchange framework in the end to analyse the London Ambulance case. The power of Sauer’s exchange framework is to analyse the information system, project organisation, supporters and its environmental influences dependently from each other. Fitzgerald & Russo

(2005) conclude in their article that after successful implementation of the HIS, the organisation itself was not ready and hence such a disaster occurred. Moser (2006) also criticises the use of ANT, arguing that they have analysed complex medical networks too simplistically in one defined process. Hanseth *et al.* (2004) mention the fundamental problem of reducing human beings to the same level as IT artefacts. In HIS the networks should rather be analysed in a local, contingent and seamless web rather than taken apart in social and technical settings or as technology in an organisation (Moser, 2006; Klecun & Cornford, 2005). Further studies of historical behaviour of actors in society are superficially defined in ANT but should rather explicitly stated. These issues have been the analysed of Klecun’s & Cornford’s (2005) evaluation programme model.

Klecun & Cornford (2005) focuses not only on technical, socio-technical, individual and organisational characteristics, but also on historical societal perspectives. They argue that it is not enough to evaluate only on success criteria but that one must also evaluate profound interrelated societal factors. Therefore, they defined an ICT Evaluation Programme (see Table 1) based on critical theory principals that focuses on social, political and historical conditions under which a system is implemented and used (Klecun & Cornford, 2005). Furthermore, it also based on a hermeneutic tradition, which explores the historical and cultural dimension of meaning (Klecun & Cornford, 2005). Applied to EHR systems, a patient record can be interpreted differently by different practi-

tioners depending on the context in which the patient record is read. These criteria have not been seen in any other related healthcare literature and could promise a new and richer theory to analyse success of HIS. Further case studies and specifically ones regarding EHR systems should be done to prove and test the practicality of the evaluation programme.

Eldabi *et al.* (2002) introduces another interesting theory, using a modelling framework based on an engineering approach, to improve the acceptance rate of users to the new system. Discrete Event Simulation (DS) (see Table 1) helps during the design and evaluation stage to give users a better understanding of the requirements of HIS and improve the communication between the various stakeholders since the model will be used as a basis for discussion (Eldabi *et al.*, 2002). This approach, however, is only successful when the model is able to represent the real life system and also focuses only on stakeholder analysis. In addition, organisational aspects as used by Fitzgerald & Russo (2005) and Berg (2000) should complement the DS theory.

Taking all analysed theories, models and frameworks presented into consideration, a common theme from technical to socio-technical over organisational and psychophysical towards hermeneutic concepts leads to a better understanding of the behaviour of every stakeholder in an emergent interwoven environment.

Limitations of literature review

The literature of failures in HIS is comprehensive and vast. Many articles analysed success and failure with different viewpoints and theories with various recommendations. Therefore, it is possible that certain issues, theories and models could have been omitted.

Another issue is the focus on interpretative epistemology, such as case studies that tend to be more subjective and could therefore bring a more subjective analysis to the literature review. More positivistic epistemological data could have complemented the analysis to get a more objective point of view.

Finally, the literature review focuses predominantly on HIS articles from healthcare journals specifically in the hospital environment. Other insights could have been gained if articles from non-medical journals or case studies from general practitioners would have been evaluated.

Conclusion

This literature review sought to analyse the different research approaches and theories that are used in the medical field to evaluate success and failure for healthcare information systems, with mainly examples from electronic healthcare records systems. First of all, success and failure criteria had to be discussed due to the ongoing debate. Since multiple stakeholders have different subjective opinions of success and failure, it is a difficult task to define success or failure in HIS (Berg, 2001).

The critical evaluation of different theories and models found in the literature shows a specific theme. Theories that highlighted the interplay of stakeholders and the environment, such as Actor Network Theory or Sauer's Exchange Framework, have been further enhanced with historical, societal and hermeneutic perspectives to gain a better understanding of the

stakeholders' habits and historical and cultural dimension of meaning in the medical context (Klecun & Cornford, 2005). These concepts focus much more on the analysis of stakeholders in an emergent interwoven environment.

The theories and success criteria evaluated in this paper should be applied interdependently with each other and would be much more powerful if they could be used in the right context with an appropriate and flexible framework as used by Heeks (2005) in his reality-gap model. For instance, the resource-based view applied in organisational contexts could define an asset as a single theory; capabilities would be the combination of different theories and core capabilities to use them in the right context for each specific case. Further quantitative measurements criteria to which degree HIS improve the patient care itself are very difficult to measure but would be another area for further research (Reinhold, 2006). Another research of interest would be the level of IT knowledge stakeholders, especially clinicians, physicians and nurses learn during their education. If the use of IT would be taken for granted even before stakeholders start working, it could reduce the barrier of acceptance of HIS.

In conclusion, while the different perspectives used to analyse success and failure broadens one's horizon, it is very likely that the success rate will still not increase due to the highly complex medical environment. Probably a fundamental change of the stakeholders' thinking towards IT artefacts has to evolve. Therefore this evaluation presented could help to gain a better understanding of recent theories and models which analyse the stakeholders' thinking and behaviour within an emergent medical environment.

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The process of user involvement in systems development

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User involvement has been perceived to bring benefits in the systems development process. The process of involving the user emerged in the 1980's, as this is the period where the socio-technical approaches to development had already appeared (Mumford 1981). User involvement can be either considered as part of systems development or as a separate process. Hence this paper considers approaches to user involvement as opposed to systems development methodologies. There is a considerable amount of empirical research, which has been undertaken to provide evidence for the proposed benefits, however it remains inconclusive. There is a need to understand the issues surrounding the user involvement process. The two major issues are the user-developer relationship and the degree of user involvement. Studying these issues shows the social and political complications that are apparent in this concept. Therefore it becomes evident that there is a need to remodel the process of user involvement.

Introduction

A significant number of information systems development projects can be considered as failures because they are either "excessively over budget, months or years behind schedule, of poor quality, or simply because they fail adequately to satisfy users' requirements" (Doherty and King 1998, p.41). A recent study by Verner (2006) identified that from a survey of 400 projects, 49% of the organisations had one or more failures. In addition to this, 33% of projects said they had no risk, yet 62% of these resulted in failure. There remains a growing concern that organisational issues are not being addressed during the development process and that this is a result of weaknesses in user involvement during systems development (Hornby *et al.* 1992).

The literature on user involvement in systems development leads to the understanding that for successful systems development the user must be involved in the process (Kujala 2003, Nandhakumar and Jones 1997). Research indicates that involvement is most effective in the early stages of the systems development, this is because costs and the difficulty to implement changes increase in the latter stages of the development process (Noyes *et al.* 1996).

The terms user participation and user involvement are often used interchangeably. It has been argued that user involvement refers to the psychological state of the user and user participation is the event which influences this state of mind (Barki and Hartwick 1989). However Kujala (2003, p.1) defines user involvement as "a general term describing direct contact with users and covering many approaches".

The increasing complexity of technology has caused a shift from the traditional hard approach to a 'softer' approach (Howcroft and Wilson 2003). This is vividly illustrated in the socio-technical approach, which combines the needs of both the social and technical aspects of systems development.

The research and literature surrounding user involvement suggests benefits such as system acceptance and increased system usage (Baroudi *et al.* 1986). However there remains ongoing review and empirical research into issues such as the differing approaches to user participation (Saleem 1994),

perceptions of user involvement (Foster and Franz 1999), the political reasoning for involving the user (Howcroft and Wilson 2003) and the challenges proposed by user involvement (Kujala 2003).

This review considers four approaches to user involvement, the reasons for user involvement and then considers the ongoing challenges of user-developer relations and differences in the degree of user involvement.

The review aims to answer the following question: with a growing number of system development methodologies reliant upon user involvement, is it not essential to first remodel the user involvement process before developing new system methodologies?

Approaches to user involvement

Kujala (2003) suggests four main approaches to user involvement. The number of systems development approaches is continually growing therefore it is appropriate to concentrate on the approaches to user involvement (see Table 1).

The aim of user-centered design is to develop a product, which is both useful and usable to its end-users. There is no fixed method for involving the user in this approach however methods include prototyping and usability evaluations. Prototyping is likely to be an iterative process, allowing the user to be involved throughout the design phase of the development cycle.

Participatory design originates from Scandinavia. Involvement takes place in a democratic form and the importance of user and organizational needs are central to this approach. This approach differs to participative decision making (PDM), a concept identified by Saleem (1994). PDM is an approach based on group decision making.

Ethnography aims to describe both human activities and culture with a focus on the social aspect. Hence it is fundamentally a social based approach. Involvement takes place through observation and developers often watch videos of the user to understand the nature of the tasks performed.

Contextual design is focused on the processes within the organization. The user involvement takes place directly with the developer through one-to-one observation sessions. This enables the developer to gain an insight of the user role in the context of the organization. Ethnography is often used within the contextual design approach.

Though the four approaches differ in the type of user involvement, the approaches originate from the same theory (Kujala 2003), which states that user involvement is beneficial in systems development. The epistemology behind these approaches is that knowledge of the organisation and technology is acquired through the communication and coordination of the user and the developer (Kensing and Bloomberg 1998).

The potential benefits of user involvement

The involvement of the user is required for the developer to gain an improved understanding of the functional requirements of a system. Involving the user enables the developer to understand the context of the users' tasks (Kujala 2003, Wilson *et al.* 1997). Jiang *et al.* (2002, p.507) identify three drivers for successful systems development; "user involvement and participation, executive management support, and a clear statement of user requirements". The statement of requirements and user involvement are related. It can be said that to achieve a clear statement of requirements user involvement is a necessity. The system should also be of higher quality due to the accuracy of the requirements (Damodaran 1996). With reference to the waterfall model for systems development, gathering requirements is the first stage of this process (Royce 1970). The requirements are considered a basis for the design and development of a system. Hence there is constant referral in the literature to involve the user early in the development process. Involving a user during the requirements phase is likely to have an impact on the final design as the requirements have been gathered directly from the end users.

An empirical study carried out by Baroudi (1986) concludes that involving the user results in increased satisfaction amongst users and increased system usage. However there are limitations to this research. A functionalist approach was taken towards the research, the 'user' was restricted to middle level management and there was little evidence to indicate that the user had any influence in the design process. To be considered as evidence for the need for user involvement it is essential that different levels of users are researched, in particular the lower level users. The reason for this is that the political issues in organisations often affect lower level users whose involvement is restricted by higher levels of management.

Mumford (1996) states that there is an increasing level of user involvement in systems development projects and management strongly believe that this leads to the creation of a more committed and motivated workforce. User involvement should increase system quality by improving the level of understanding by the user (Ives and Olsen 1984). These papers take a social perspective towards the involvement of the user and do not consider the effects in an economic or political view.

An effort can be made to minimise user related risk through increased user involvement. User related risks include user

resistance to change, lack of support and unwilling IS users (Jiang *et al.* 2002). Involving the user prior and during systems development can help address these problems. The research was carried out by a mail survey to random members of a project management group. This functionalist approach fails to consider the user involvement process in systems development. An overall response rate of 37% further adds to the limitations and questionable accuracy of this research.

User involvement is also said to improve buy-in, greater system acceptance and usage (Gallivan and Keil 2003). The user involvement process in the early stages of development often raises requirements that developers may have never considered. Inclusion of such requirements in the system then leads to buy-in of the system. This is because users feel they have influenced the design of the system and that their opinion has been taken into consideration. However a study conducted by Ives and Olsen (1984) found that from a total of 22 studies only eight represented a positive relationship between user involvement and system success. User involvement is also considered to facilitate the implementation of a system. This is achieved by ensuring acceptance of the system and also providing continuous support for the users (Nandhakumar and Jones 1997).

Though there have been various benefits of user involvement discussed by different authors, the issues of user-developer communication and continuing failure of IS projects raises concerns about the practical use of the user involvement concept. The result of a case study carried out by Iivari (2004, p.294) suggests that "user involvement might be used as a buzzword and as a ritual that has form but no substance".

The user-developer relationship

One common issue surrounding user involvement is that it may lead to the gathering of incorrect or irrelevant requirements. This is because users are often unaware as to what information is needed by the developers (Kujala 2003). Developers may agree with the principles of involving the user however there are few who follow them. This then causes communication problems between the user and the developer (Webb 1996). Discovering the problems with user-developer relationships begins to show that user involvement is a concept which both the user and developer find challenging.

The perception of user involvement often differs between the user and the analyst. This difference in perception can result in problems with successful systems development and user satisfaction. This also leads to communication problems between the analyst and the user (Foster and Franz 1999). A field study conducted by Foster and Franz (1999) concluded that analysts and users do not rate user involvement the same. The study also stated that there was a positive impact on system acceptance through user involvement. An interpretivist approach was taken towards the research allowing it to include a wide range of organisations and used the lead analyst when possible. The research only included users who had been involved in more than one of the development stages.

A study conducted by Wilson *et al.* (1997) shows the importance of selecting the right users. Kujala (2003) also states that there can be difficulties of identifying the appropriate end users. It is common for a developer to be unable to include all users due to constraints which may be physical, social or individual (Nandhakumar and Jones 1997). The selec-

Table 1. User involvement approaches.

	User-centred design	Participatory design	Ethnography	Contextual design
Emphasis	Usability	Democratic participation	Social aspects of work	Context of work
Typical methods	Task analysis, Prototyping, Usability evaluations	Workshops, Prototyping	Observation, Video-analysis	Contextual inquiry ¹ , Prototyping

¹Contextual Inquiry is a field interviewing method which combines observing and interviewing (Beyer and Holtzblatt 1998).

*Source Kujala 2003

tion of users is often affected by political conflicts. Some users express a willingness to be involved as they feel their input towards the system requirements is essential. The developers feel they have the knowledge and expertise to select the right users to be involved. The final conflict comes from management; Howcroft and Wilson (2003) take a political stance towards user involvement by identifying that higher level management motives are likely to go beyond the system such as reducing absenteeism and increasing productivity. Therefore this three way conflict indicates the political issues which arise during user involvement in systems development. The user involvement process needs effective management as it potentially has more conflicts than system development methodologies. Hence it is necessary for developers to have some form of training on organisational relations (Howcroft and Wilson 2003).

Wilson *et al.* (1997) discusses the “facilitators and obstacles” to user involvement. Educating the user is seen as a facilitator to this process. Users often have knowledge of the organisation however it is the developers who design the system. The lack of knowledge in designing systems prevents full user involvement and can result in users having passive involvement (Howcroft and Wilson 2003). Though much of the literature concentrates on the necessity of users educating themselves for the involvement process, there is little to indicate the weaknesses of the developer. It is common to find a set of principles and guidelines for involving users in the development process. Gathering requirements is often achieved by interviewing the user. This process requires the developer to have social skills (Kujala and Mantayla 2000). Social skills can be used by the developer not only whilst interviewing but also to overcome constraints which cannot be solved through practical negotiation (Nandhakumar and Jones 1997).

Degree of involvement

The degree of involvement “refers to the amount of influence the user has over the final product” (Ives and Olsen 1984, p.590). Mumford (1981) stated three types of user involvement:

1. Consultative – the users are consulted when decisions are being made however the final decision is not made by the users
2. Representative – a group of users are selected to represent the needs and requirements
3. Consensus – this is the extreme of both previous

types. The users make the decisions and take full responsibility for implementation.

Howcroft and Wilson (2003, p.7) argue that the degree of involvement is heavily influenced by “power relations inherent in the workplace”. They feel it is often the management who decide what approach will be taken towards user involvement. Kensing and Bloomberg (1998) suggest that participative design (an approach to user involvement) aims to “rebalance the power” not only between users and the developers but also between the users and management. This political stance is then challenged by Webb (1996, p.76) who questions the degree to which users should be involved through the use of a metaphor, “when computers are theatre, do we want the audience to write the script?” This metaphor has weaknesses as it is assumed that user involvement means consensus involvement. A consultative approach towards involvement can be used and the use of this metaphor does not suggest this. Iivari (2004) suggests that user involvement is influenced by the culture of the organisation. The culture of the organisation facilitates the user involvement process and the degree of involvement is influenced by the importance of people in the organisational culture.

Vroom and Jago (1988) define the degree of involvement differently from Mumford (1981):

1. Direct or indirect
2. Formal or informal
3. Performed alone or shared.

Direct refers to the user having personal involvement and indirect refers to the views of the user being represented by others. Formal refers to structured involvement such as meetings and informal refers to discussions, which may have taken place with the developer. Performed alone refers to activities unique to the individual user and shared refers to activities which are common amongst a number of users (Barki and Hartwick 1994). Comparing the definitions of the degree of involvement of Mumford (1981) with Vroom and Jago (1988) shows a relationship between the two. It is possible that both methods be used in conjunction. Mumford (1981) defines the degree of user involvement and Vroom and Jago (1988) define the various forms in which this involvement can occur. However both definitions are from the 1980’s and there is little literature in recent times which illustrates a different understanding or approach to the degree of user involvement in the development process.

It is important to consider the degree of involvement because it is the approach towards this, which will determine the influence that user involvement has had on the systems development. Therefore it can be said that the type of involvement is separate to the channel of involvement. For example a user may have consultative involvement, which takes a formal or informal channel.

Limitations

The review has no standardised quantitative measure for the benefits of user involvement in systems development. As an effect, the benefits have been discussed in a qualitative manner, however there is little statistical evidence providing support to this argument. It can be argued that the benefits of user involvement are not quantifiable. This is not only a weakness of the review it is also apparent in the IS field.

The cost-effectiveness of user involvement has not been considered. The benefits on user requirements, system usage and system satisfaction have been discussed. However the volume of information which users generate and the cost impact on development has not been discussed in detail.

There is a high percentage of literature used from the 1980's. Thorough research was conducted, however the user involvement concept was the topic of the 1980's as this is when the concept was adopted into systems development.

Finally, it should be noted that the review has not taken the engineering perspective into account. It concentrates mainly on the social and political issues which can surround the process of user involvement. Including the engineering or economic perspective may have allowed a greater examination of the user involvement process.

Discussion and conclusion

The empirical research reviewed demonstrates some relationship between user involvement and system acceptance. However there is no hard evidence to suggest that there is a definitive relationship between user involvement and system acceptance. As stated by Howcroft and Wilson (2003) there remains myths that user involvement leads to successful systems development.

A considerable amount of the literature reviewed comes from the 1980's, as this was a key period of growth for the socio-technical approach. So, the recent literature has been concentrating on systems development methodologies such as rapid applications development (RAD), extreme programming (XP) and the socio-technical approach. However there is a need to return and review the process of user involvement as opposed to system development methodologies.

User involvement can lead to successful development and increased usage however the process needs to be remodelled. As identified in this review, the process of involvement can be a conflict of differing rationalities, commonly the social and the political. It is important that the degree of involvement is determined between the user and developer, not by management. This is because management motives may hinder the process.

Reviewing the developers role can assist with the user in-

volvement process during systems development. Research into how the developer can gain organisational knowledge is vital. Any "information system is a social system" (Smithson and Angell 1991) therefore the developer requires more than technical expertise. Social skills are now a necessity for the developer. It can be argued that possibly both the user and developer need educating *before* the development process begins as opposed to learning during the process. With a user having some technical knowledge they will be in a position to provide relevant requirements. For the developer having knowledge and understanding of the organisation will enable them to incorporate this unique context into the system.

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Agility in information systems development: characterisation, motivation and conceptualisation

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Agility in information systems development has recently received a considerable amount of attention. It is seen as a radical response to the difficulties organisations face when following a rigid traditional software development approach in the context of constantly evolving requirements in an increasingly competitive business environment. Although practiced in industry for years, agility is still an elusive concept and researchers have only just started to conceptualise it. This paper reviews literature on how software engineering accounts for agility by delineating agile and traditional methodologies. Motivations for agile methodologies, given by information systems literature are reviewed and attempts of conceptualising agility are presented. The theoretical underpinnings used by researchers to conceptualise agility are found to be very diverse and range from military, manufacturing, complex adaptive systems theory to information technology innovations and organisational learning. Finally a novel way of investigating agility is briefly presented by linking it to the new socio-technical view on systems development.

Introduction

The highly competitive business environment organisations operate in is characterised by constant change. In order to manoeuvre through or even take advantage of the turbulences created by internal and external change factors, organisations are increasingly confronted with the need to respond and adapt in a quick and resourceful fashion – they need to be *agile* (Mathiassen & Pries-Heje, 2006). Information technology (IT) has a crucial, and at the same time ambivalent role with regards to agility: it can be an enabler and a disabler (van Oosterhout *et al.*, 2006). While a malleable and simple IT infrastructure may support an organisation in its attempts to reconfigure its capabilities and business processes in order to take advantage of expected and unexpected turbulences, a rigid and complex IT infrastructure may hinder those efforts. Organisations developing software or software-supported products face additional challenges, as not only their IT infrastructure, but also their software development processes need to be agile (Mathiassen & Pries-Heje, 2006).

As a reaction to numerous problems with traditional information systems development (ISD) approaches, new methodologies incorporating agility have emerged and recently received a considerable amount of attention within the fields of software engineering and information systems (IS). A catalyst was the publication of the Agile Manifesto (Beck *et al.*, 2001), which lays down the main values of agility from a practitioners' point of view. The first part of this literature review introduces what agility in ISD is. Then follows a discussion of the main motivations for agility as identified in the literature. In the third part different attempts of conceptualising agility are put forward. Finally a conclusion is presented, which reflects on the reviewed literature and proposes directions for further development.

What is agility in ISD

New and rather unorthodox ISD approaches emerged at the end of the 1990s and indicated the beginning of a new era, a '*post-methodology era*' (Avison & Fitzgerald, 2003), or better a post-traditional-methodology era. Those new approaches were informally referred to as lightweight approaches to distinguish them from the traditional, well-established, heavyweight engineering methodologies they sought to challenge (Fowler, 2006). Although the lighter methods, among which

the most prominent were and still are Extreme Programming (Beck, 1999) and Scrum (Schwaber & Beedle, 2001), had different emphases and priorities, they shared a set of common principles, which were expressed by their proponents, a group of independent practitioners, in the coining of the term agile for their methods and in the subsequent publication of the Agile Manifesto:

*“Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan”*
(Beck, 1999)

Although the Agile Manifesto gives evidence of when a methodology may call itself agile and when it may not, it does not actually define the term. In fact, there does not seem to be a generally accepted definition of agility in literature (Conboy & Fitzgerald, 2004). However, as agile methodologies are a counter-movement to traditional methodologies, reviewing how software engineering literature delineates both approaches in terms of process, product and people, presents an insightful picture of agility and yields an implicit definition.

Process

A process, in the context of an ISD methodology, defines a strict sequence of phases and a specific set of conditions that need to be met before moving on to the next phase (Boehm, 1988). Traditional methodologies are fully specified and steered by a statistical process control model (Humphrey, 1988). Different aspects of the process are measured and used as input to stabilize the process and make it repeatable, so that it delivers the same result when executed repeatedly, as with industrial processes. In contrast to traditional approaches agile processes are adaptive and follow an empirical process control model (Schwaber & Beedle, 2001). The loosely defined agile process is steered towards a desired end by constantly assessing and redirecting the process, without aiming for repeatability, as the environment is assumed to be volatile.

People

Traditional methodologies define roles for project members, for example analyst, developer or tester (Fowler, 2005). Those roles and their associated fully specified tasks drive the project forward, from one phase to the next. A good process

is seen as the critical success factor (Humphrey, 1988). Agile methodologies are different; they do not regard the process, but the people, who work as a team to achieve a desired outcome, as crucial for success or failure (Cockburn & Highsmith, 2001). A premium is therefore placed on the excellence and superior capabilities of the project members to thrive in the uncertainties of an adaptive process. However, as Boehm (2002) cynically points out almost half of all software developers are below average. Another peculiarity of agile methodologies is the strong collaboration with customers. While traditional methodologies limit direct contact to and collaboration with customers to the early upfront specification of the requirements, agile methodologies aim to have a customer as a permanent member of the team (Baskerville *et al.*, 2006, Beck, 1999, Schwaber & Beedle, 2001). It is difficult however, to convince a client organisation to give away an employee with high domain knowledge and enough authority to push decisions as Nerur *et al.* (2005) point out.

Product

Traditional methodologies aim at delivering at once at the end of a project a fully-fledged product, which hopefully meets the set out specification. Agile methodologies are different; they frequently deliver working software to the customers, who see immediate benefits and are given the opportunity to reprioritise their requirements and to propose new ideas for further development (Beck, 1999, Schwaber & Beedle, 2001). The product is delivered quickly in a base version and then growing in an organic way (Truex *et al.*, 1999).

Delineating agile and traditional methodologies using literature by the creators of agile methodologies (Beck, 1999, Beck & Andres, 2005, Cockburn, 2002, Cockburn & Highsmith, 2001, Fowler, 2005, Schwaber & Beedle, 2001) conveys a somewhat uncritical view towards the new approaches and their advantages. A more balanced view is given by Boehm (2002), who argues that both traditional and agile methodologies have their '*home grounds*', in which they perform best. Nerur *et al.* (2005) also take a more unbiased stance towards agile methodologies and point at challenges and problems ISD organisations face when they adopt the agile approach.

Motivations for agility

Literature by creators of agile methodologies often very broadly identifies change as the key motivation to be agile (Beck, 1999, Cockburn & Highsmith, 2001). The IS literature on system development is richer and identifies various push factors for agility, which are all directly or indirectly related to a mismatch of traditional methodologies with modern organisations.

Traditional rational software design processes, as Parnas & Clements (1986) argue, can hardly be strictly followed. They are too idealized and do not reflect the inherent uncertainties of our world and the limitations of human mental capacity. However, it can be tried to follow a rational process as closely as possible and where workarounds or deviations from the ideal process are needed, the required intermediate results can be faked. This argument is supported and enhanced by Nandhakumar & Avison (1999) who contend that traditional rational ISD methodologies are merely a '*necessary fiction*' to simulate being in control of a world full of uncertainties, in which improvisations and workarounds are an ongoing practice and exist tacitly within the rational methodology. These workarounds and improvisations can be

seen as '*amethodical*' (Truex *et al.*, 2000) agile practices which have always existed within traditional methodologies. They have just been distilled and moved into the foreground by agile methodologies as Pries-Heje *et al.* (2004) indicate.

Truex *et al.* (1999) see the fast moving business climate driven by globalisation and technological advances as factors undermining the stability of an organisation. Organisations are in constant motion, they are '*emergent*'. This transformation of the nature of an organisation has implications on IS and redefines the way how IS need to be developed. It is argued that systems must evolve with their organisational environment and as a result systems must be under constant development. Users are provided with systems as soon as possible and then the systems grow organically, while virtually being in perpetual development and maintenance. Such a development model can hardly be realised with conventional traditional ISD methodologies as long-term planning and meticulous up-front specification are not possible. Agile methodologies however, fit such a development model as they regard organisations as complex adaptive systems with emergent properties (Highsmith & Cockburn, 2001). The '*emergent organisation*' can thus be seen as a push factor for agility in ISD.

Technological characteristics have changed in the last decades, from monolithic mainframe computers to the distributed nature of the internet. Agility in ISD is often associated with the rise of the internet (Aoyama, 1998, Baskerville *et al.*, 2003, Baskerville *et al.*, 2006). The effects of the internet on ISD are visible in two dimensions - on the one hand as a business driver in the form of a reduced time-to-market, on the other hand as a technological driver, which has brought about a novel technological platform and provided developers with tools to quickly develop applications. In fact Baskerville *et al.* (Baskerville *et al.*, 2003) note that ISD for the internet, has led to a strong dependence of developers on tools, which is somewhat in contrast to the Agile Manifesto, which plays down the importance of tools.

Higher-order agility, such as '*enterprise agility*' (Overby *et al.*, 2006), i.e. '*the capability of quickly sensing and responding to change*', can also be identified in the literature as a driver for agility on a lower level, i.e. the IS production level. Overby *et al.* (2006) argue that the responding capability can be improved by rapid and cost-efficient systems development. Agile methodologies match these systems development characteristics better than traditional approaches and can be seen as an enabler for enterprise agility.

Conceptualisation of agility

Although chief information officers strongly feel they need agility, their notions of agility differ and they have difficulty pinning down the term (Schrage, 2004). A reason for this can be seen in the missing theoretical underpinning of agility in ISD as Conboy & Fitzgerald (2004) point out. Theory in ISD has historically had problems keeping up with best practice in industry (Fitzgerald, 2000). In the case of agility this seems to be validated once again. Slowly, however theory tries to catch up with practice as scholars embark on conceptualising agility.

Conboy & Fitzgerald (2004) try to broadly conceptualise agility by drawing from manufacturing and systems thinking. By combining principles of flexible and lean manufacturing they

propose a definition of agility:

“...the continual readiness of an entity to rapidly or inherently, proactively or reactively, embrace change, through high quality, simplistic, economical components and relationships with its environment”.

The underlying aim of agility in ISD is identifying and coping with change, according to Conboy & Fitzgerald (2004). They propose an agility framework for ISD organisations, which identifies four main activities in regards to handling change: ‘creation’, ‘proaction’, ‘reaction’ and ‘learning’. Accordingly, an agile ISD organisation is supposed to handle change as early as possible by actively creating change and proactively eliciting change. Being surprised by change and having to react to change is to be avoided. The learning activity aims at improving the change handling capabilities over time. A similar avenue is taken by van Oosterhout *et al.* (2006), who enhance the concept of flexibility to define agility as having the capacity to quickly respond to familiar and unfamiliar changes. The definition of agility given in Oosterhout *et al.* (2006) is however at enterprise-level and not as in Conboy & Fitzgerald (2004) at process-level. An agile IT-infrastructure facilitated by agile ISD is seen by van Oosterhout *et al.* (2006) as an enabler for higher-level agility. Fowler (2005) calls for prudence in terms of drawing analogies between manufacturing and ISD as Conboy & Fitzgerald (2004) and van Oosterhout *et al.* (2006) do, since manufacturing and its underlying scientific management paradigm have historically brought many problems into the ISD domain, such as a strict separation of design, implementation and test for instance.

A different and rather unorthodox approach to conceptualise agility in ISD is taken by Adolph (2006). He draws on military literature, in which a fighter pilot is regarded as agile and as likely winner of an air combat, if she runs an ‘*observation, orientation, decision and action (OODA) – loop*’ faster than her opponent. Accordingly, development teams that can orient themselves quickly and make fast decisions in times of uncertainty, will be able to take better action and will be more likely to survive in the fast-paced business world. A corporate culture facilitating agility is presented in terms of the German Blitzkrieg, where the principles of ‘*Einheit* (unity or trust)’, ‘*Fingerspitzengefühl* (skill or expertise)’, ‘*Austragstaktik* (intent)’ and ‘*Schwerpunkt* (vision)’, are claimed to help an agile team to thrive in an uncertain and unpredictable environment.

Highsmith & Cockburn (2001) argue that agility in ISD is based on the worldview that organisations are complex adaptive system. That thought is taken up by Meso & Jain (2006), who describe the concept of agility by mapping agile practices to complex adaptive systems theory principles. Especially phenomena like emergent requirements, growing systems or self-organising teams find a strong theoretical foundation in the rich and well-developed literature on complex adaptive systems theory.

Lyytinen & Rose (2006) make a case that agility in ISD can be conceptualised as having the dynamic capability to balance the organisational learning concepts of exploration and exploitation in order to match the level of innovation and speed required within the ISD process. Speed and innovation are seen as conflicting goals. During exploration ISD organisations sense and adopt innovations from organisations de-

ploying their products and from organisations delivering base technologies. During exploitation ISD organisations strive to speed up their delivery process by incorporating and adapting the acquired innovations. As agility is often associated with speed, Lyytinen & Rose (2006) argue that agile ISD methodologies (Beck, 1999, Schwaber & Beedle, 2001) may improve the exploitation capabilities of an ISD organisation, but are of little help to drive exploration. A contrasting view is provided by Vinekar *et al.* (2006), who regard agile methodologies as appropriate for supporting the exploration ambitions of an ISD organisation, which take place in a volatile environment. Traditional methodologies are associated with exploitation activities, which are assumed to be executed in a stable environment. As an organisations’ environment can have both, fast changing parts and relatively more stable parts, they propose an ‘*ambidextrous*’ ISD organisation, which has agile development units as well traditional development units.

Conclusion and reflections

Early research in and descriptions of agility in ISD have predominantly come from the discipline of software engineering and from practitioners, who saw the short comings of the traditional highly formalised methods in a changed and highly accelerated business world. The first publications about agility in ISD were a novel combination of best practices based on simple values (Beck, 1999, Beck *et al.*, 2001, Cockburn & Highsmith, 2001, Schwaber & Beedle, 2001). Many of those best practices and values are rooted in the social sciences and are not of a technical nature. The movement from traditional formalised ISD to agile ISD can therefore be seen as an interpretivist one (Casey & Brugha, 2005). Recently IS research has taken up agility in ISD and made attempts to ground it in theory. The range of theoretical links and underpinnings is very diverse and includes military (Adolph, 2006), complex adaptive system theory (Meso & Jain, 2006), flexible and lean manufacturing (Conboy & Fitzgerald, 2004) and organisational learning and IT innovation (Lyytinen & Rose, 2006). IS research on agility in systems development has just started and the concept is still elusive. Further efforts are needed to enhance existing IS research topics to accommodate agility in systems development or to link agility in systems development to enduring IS themes, such as the new socio-technical approach to systems development for instance.

The author sees strong similarities between the agile approach to systems development and the new socio-technical view on systems development. In agile ISD, system developers and users find themselves within a continuous feedback loop, try to make sense of the changing organisational environment and do not believe in objective pre-specifiable requirements. Users participate in the agile design process as much as developers. They are encouraged to feed back new requirements and ideas while the system is incrementally growing. Systems in agile ISD are in an ongoing state of design, as the traditionally separated activities of analysis, design and implementation are practically merged and executed in very short cycles (Beck, 1999). The new socio-technical view on systems development similarly stresses that systems are to be designed and shaped ‘*in-use*’ (Lin & Cornford, 2000) and are to co-evolve with ever changing work practices (Berg, 1999). Also Ciborra’s (2002) notion of ‘*hospitality*’ can be found in the agile approach to ISD. Users and devel-

opers align themselves with the growing systems. They decide in the context of the current situation with no meticulous long-term plans and formalisations imposed on them and they have the '*negative capability*' (Ciborra & Lanzara, 1994, quoted in Ciborra 2002) to thrive in uncertainty. It is thus very surprising that scholars have not yet drawn from socio-technical literature to explain and conceptualise agility in ISD.

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Electronic Government – The Key to Good Governance in less Developed Countries?

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International development agencies carry out development projects in order to promote ‘good governance’ standards. Increasingly, electronic government (e-government) projects are being initiated in Less Developed Countries (LDCs) with the goal of ‘e-enabling’ good governance in the public sector. However, the contribution e-government can make to achieving good governance is not without controversy. This essay classifies the relevant literature according to the predominant schools of thought, categories of good governance, available empirical support and theoretical perspectives. On the basis of this classification, an evaluation is carried out. The areas of analysis are scope/focus of the research, empirical foundations and term definitions. The essay concludes that the revealed research gaps show that an adjusted problem focus and more empiric underpinning is required.

1 Introduction

Information and Communication Technologies (ICTs) and Information Systems (IS) are not only used in private organisations but also in the public sector. Since its emergence approximately 15 years ago, e-government is increasingly being seen as an influential driver in supporting the development of Less Developed Countries (LDCs). Furthermore, many international organisations regard e-government as being a driver for good governance in LDCs, and fund e-government projects in LDCs accordingly.

While there are claims that e-government implementations lead to development ‘leapfrogging’ of government institutions in LDCs – thus achieving good governance – , it can also be argued that the usage of e-government as such does not directly result in an improved functioning of the public sector according to good governance standards. Furthermore, review of the literature also shows that these discussions are often based on different definitions of the terms e-government and good government .

The literature on this field will be categorised to get an overview of the current status of the debate. A classification framework will be used to show the contrasting views found in the literature and to identify research gaps. The definitions of good governance and e-government by international organisations will be discussed, as they have significant implications for the type of e-government initiatives which are being launched.

Beginning with the definitions and interconnections of the terms good governance and e-government (section 2), the following section (section 3) will look at the current arguments. The essay will conclude with an evaluation and outlook (section 4), stating the needs for further research. Many reviewed articles lack empirical support and often focus on only one e-government aspect. Furthermore, the meaning of the terms good governance and e-government should be reassessed.

2 The terms ‘good governance’ and ‘e-government’

The term good governance emerged in the 1980s, as the World Bank began to describe factors and requirements for market-oriented growth in LDCs (Haldenwang 2004). In the “Monterrey Consensus” (2002), international development agencies (IDAs), non government organisations (NGOs) and

governments agreed on a set of development aid policies and guidelines, stressing the importance of good governance (Ciborra and Navarra 2005).

The World Bank defines 5 dimensions of good governance: public sector management, competitive private sector, structure of government, civil society participation and political accountability (WorldBank 2006). Similarly, the United Nations (UN) define good governance as having 4 different dimensions: economic, political, administrative, systemic (UN 1997). In even more general terms, good governance can be described as a “commitment to democratic values, norms & practices, trusted services and just & honest business” (Okot-Uma 2001, p. 2).

In summary, it can be concluded that the core concepts of good governance are better *accountability*, improved *transparency* and increased *citizen participation* (Okot-Uma 2001). *Accountability* refers to the fact that public servants are being held accountable for their actions (Heeks 2000). *Transparency* refers to a more transparent process of decision making within government institutions. Greater *citizen participation* means that citizens should be able to interact closer with the government and that government-to-citizen (G2C) communication should be increased (Seifert and Bonham 2003). For many rich states and IDAs, good governance has become the *conditio sine qua non* for supplying aid to LDCs (Ciborra and Navarra 2005).

Following the Monterrey consensus, e-government projects began to be regarded as a catalyst for wide ranging reforms of the public sector in LDCs (Haldenwang 2004). The main sectors of e-government are government-to-government (G2G; this includes sharing data between government institutions), government-to-business (G2B; improved procuring and streamlined regulatory processes) and G2C (improved accessibility of government services via ICT) (Seifert and Bonham 2003). Okot-Uma (2001, p.9) defines e-government as “the processes and structures pertinent to the electronic delivery of government services to the public”. The OECD has a more narrow definition: “The use of information and communication technologies, and particularly the internet, as a tool to achieve better government” (OECD 2003, p. 23). Although the plethora of definitions show that e-government initiatives may take on many forms, summarising the definitions points towards the importance of using e-government not only as a tool for improving citizen interaction and involvement with

public services, but also towards using e-governance as a means to change process structures within government institutions. Because of this, e-government is viewed by some as being a tool for achieving good governance.

3 Classification of relevant literature

Drawing from the definitions of good governance from section two and the classification into the categories *accountability*, *transparency* and *citizen participation*, this section will introduce different points of view in regards to using e-government to lead to these three characteristics of good governance. Items will also be categorised according to the type of empirical support given and the theoretical perspective used (see table 1).

3.1 School of thought: Pessimistic in tendency

Ciborra (2005) states that the impact of technology solutions cannot be viewed in isolation. The author doubts whether the implementation of e-government improves democracy and fosters development. Focussing on a field study which looks at e-government projects in Jordan, he shows that even the implementation of a comparably simple e-government application (in this case: a drivers and vehicle licensing programme) with a supposedly low risk and high yield will produce a high number of unexpected difficulties (Ciborra 2005). In sum, such a small application “turns out to be a hologram in the small of the difficulties of e-government in a developing country: extremely complex, high risk, and calling into question the role of the state in relation to its citizens” (Ciborra 2005, p. 266). He goes on to say that rather than increase transparency, the introduction of e-government offers bribery to new intermediaries. In order to achieve public sector reform, transformation and learning capabilities are needed; the roles of ICT in this context are not very significant (Ciborra 2005). This view is also supported by (Ciborra and Navarra 2005), who argue that it is unclear how the costs of transition to reformed government institutions can be re-

duced by supporting the diffusion of ICT. By using an interpretive perspective, both articles state that the biggest challenge of implementing e-government is the high complexity of the state apparatus and “[...] the push for democratic reforms without real popular participation” (Ciborra and Navarra 2005, p. 156).

A similar point is being made by (Wade 2002). He states that in many academic articles about e-government, authors wrongly generalise from successful pilot projects without paying attention to the “scaling up” of problems (Wade 2002). E-government projects may be successful for one particular set of functions, but the scope of the project cannot be easily expanded. Occurring problems on a practical level can include insufficient resources to secure proper teaching and maintenance. A far more complex problem is the already existing process structure within the government: providing G2C services in a single rural village may “just” be a technical problem. But implementing G2G projects (i.e. increasing transparency in bureaucratic processes) in a complex structured government ministry requires not only technology, but also political support. He goes on to say that ICT restructuring projects cause “drift”: they tend to cause a loss of control, productivity and accountability (Wade 2002), as there are always unintended interactions between different subsystems within an ICT structure and human actors. He emphasises that ICT-for-development literature is biased towards the supply side (donor countries, international organisations), and doesn’t take into account the demand side (Wade 2002). In addition, measurable indicators of the effect ICT has on human development *over time* do not exist, instead, the literature merely presents anecdotes about successful e-government projects (Wade 2002).

The issue of sustainability of e-government projects is another source of pessimism: it can be argued that even if e-government projects are successful, the long term effects are often not measured. Kumar and Best (2006) study a rural

Author	Discussed categories of good governance	Empirical support / case studies	Theoretical perspective
<i>School of thought: Pessimistic in tendency</i>			
Ciborra and Navarra (2005)	Citizen participation, transparency	1 field study	Interpretivist
Ciborra (2005)	Citizen participation, transparency	1 field study	Interpretivist
Wade (2002)	Accountability	Numerous projects quoted	Positivist
Kumar and Best (2006)	Citizen participation, transparency	1 field study	-
<i>School of thought: Optimistic in tendency</i>			
Basu (2004)	Citizen participation	3 G2C projects quoted	Positivist
Haldenwang (2004)	Citizen participation, accountability	-	-
Okot-Uma (2001)	Citizen participation	4 G2G project quoted 1 G2C project quoted	Positivist
Hammond (2001)	Citizen participation, transparency	4 G2C projects quoted 1 G2G project quoted	Positivist
Zhang (2001)	Transparency	1 G2G project quoted	-
Heeks and Davies (1999)	Citizen participation, transparency, accountability	1 G2C project quoted	-

Table 1: Categorisation of the literature

G2C project in Melur, India which is a positive example for an e-government project. Village “e-kiosks” were successfully allowing citizens to make simple transactions with the local government (i.e. order income certificates). Two years later, the project was given up because of missing political and administrative support to remain institutionally viable (Kumar and Best 2006). The authors conclude that even “simple” G2C e-government projects have no effect on good governance if such a project is being undertaken in an isolated context. Reforms can never be solely driven by technology.

3.2 School of thought: Optimistic in tendency

Basu posits that e-government, coupled with “smart and timely government policies” (Basu 2004, p. 114), has the potential to achieve development objectives in LDCs much faster than development projects that do not utilise e-government. He says that the underdeveloped ICT infrastructure in LDCs and lack of adequate training possibilities are the major constraining factors for successfully implementing G2C e-government services. However, by summarising three successful G2C projects from Brazil, Africa and Asia (Basu 2004), the paper concludes that these projects reaffirm “the faith in what has been termed ‘leapfrog’ technology” (Basu 2004, p. 119). In a similar manner, Okot-Uma (2001) emphasises that e-government projects must primarily support G2C projects. Both authors base their conclusions on multiple G2C projects which they cite from other sources.

Just focusing on G2C, the tasks and issues involved with implementing e-government may be clearly outlined. However, even a comparatively simple G2C project may have far reaching impact on internal procedures of public institutions, which affects the distribution of power and material resources (Haldenwang 2004). Because of these effects, e-government can be seen as being a tool for supporting existing reform programmes. E-government projects only make sense if the political, social and economic reforms are supported by reform-oriented actors in politics. The author sees e-government as a powerful tool: just as e-government can be used to facilitate change, it also has the capability to change the distribution of power within the public administration.

One may also argue that introducing e-government in a LDC will actually jump-start development. Hammond (2001) supports this argument by quoting from a mobile phone development project in rural Bangladesh: the rural mobile telephone system, having been installed in a couple of villages, became a success, providing “economic benefits” and “improving the lives of villagers in ways that put most antipoverty programs to shame” (Hammond 2001, p. 100). The author provides four further examples of how G2C e-government projects have improved the lives of people in LDCs. In contrast to Wade (2002), who believes that a successful e-government project requires backup by political actors, he argues that individual G2C projects can accelerate bottom-up development, even if the government didn’t plan or expect this type of outcome from a G2C e-government project. This might even lead to improved transparency inside public sector institutions, because improved communication channels facilitate this (Hammond 2001).

Zhang (2001) shares this point of view. Looking at China’s e-government project “Government Online Project” (which was started in 1999), Zhang (2001) claims that e-government will

increase transparency in the public sector. Although the political motivation behind this project was to implement a system which allows for an easier communication with citizens (Zhang 2001), the use of the government intranet system has in fact sparked moves toward more transparency within the public sector, because the information exchange between communal, regional and national government bodies has been made easier.

While some view ICT as having a primary role in government reform, it is crucial to first understand what role ICT may have in a reform process (Heeks and Davies 1999). Only by initiating cultural and structural changes in government organisations it is possible to introduce technology as the “servant of reform” (Heeks and Davies 1999, p. 45). The authors call this the “integrate approach” to information age reform, and they regard that approach as being the key to successfully employing technology in the public sector: public officials must become information literate and ICT must be integrated into an overall process of organisational change. E-government projects will be part of a wider reform process, and thus contribute to achieving good governance. However, numerous structural, cultural and technical barriers make this approach a difficult endeavour, and Heeks and Davies (1999) can quote only one example from a LDC where this approach has been successfully used.

4 Evaluation and outlook

Most of the available literature on e-government projects in LDCs deals with project failure in a very narrow perspective. The aim of this literature review was to “take a step back” and look at the link between e-government and good governance, because in some cases, researchers seem to attribute a transformative potential to e-government projects without questioning this. Due to space constraints, not all available literature could be reviewed. However, the selected literature gives a good impression of the current status of research. By relating to the categorisations in table 1, the findings can be evaluated and placed in a broader picture to indicate research gaps.

4.1 Scope of research

As stated in section 1, the term good governance comprises of the three segments citizen participation, transparency and accountability. Table 1 shows that the literature concentrates on citizen participation and – to a lesser extent – on transparency issues of good governance. Only six papers discuss more than one characteristic. This indicates that current research focuses on individual aspects of good governance, without looking at the impact on government institutions as a whole. Most reviewed articles place an emphasis on improved citizen participation through G2C e-government projects. Success and failure of such a project can be empirically assessed. However, G2C projects address just one aspect of improved citizen participation according to good governance standards. The effects of G2G e-government projects on improved transparency and accountability, however, are more difficult to measure, and have not been covered in the literature to the same extent.

4.2 Empirical support and theoretical perspectives

As can be seen in table 1, the vast majority of the reviewed literature does not contain specific empirical field studies.

Most quoted case studies do not focus on long term effects and do not address sustainability issues. In some cases, conclusions are drawn from merely one project. The derived conclusions are not always appropriate, as they only selectively point out singular issues of good governance. Furthermore, these case studies are often interpreted under a positivist perspective (see table 1). But as the underlying case studies cannot be used for generalisations (they are often highly country and environment specific), the author's conclusions often lack an empirical foundation. An interpretivist viewpoint might better contribute to the understanding of the problem, as the dependencies of various actors and organisations can be exposed more clearly. As the use of new technology in the public sector is intrinsically embedded into social contexts, such a research philosophy may be more appropriate to examine this question.

4.3 Evolving focus of research

The term good governance has evolved independently from the term e-government, although some good governance definitions mention e-government. As a result, research literature often focuses only on one of these terms. While good governance has mainly been discussed in law and government journals as well as in publications of international organisations like the UN and the World Bank, e-government has been in the focus in many IS journals, with an emphasis on technical implementation issues. As a result, a coherent form of research discussion which sees the two terms entangled was missing. Since the beginning of the 21st century this has begun to change, as more articles appear that view e-government in the light of achieving good governance (see for example Ciborra and Navarra (2005)).

4.4 Definitions of the terms 'good governance' and 'e-government'

The definitions for good governance used in the literature come predominantly from international organisations like the World Bank. These definitions have underlying assumptions, one of which may be that by striving for an accountable and transparent state, achieving an efficient market economy is an important goal of good governance. Due to international organisations being the main initiators of development projects in LDCs, their definitions are often implicitly being followed in the literature. Similarly, some definitions for e-government are one dimensional (i.e. see the OECD definition in section 1). By reassessing the definitions, researchers might be able to find further (i.e. non market centred) criteria for good governance.

4.5 Outlook

The mentioned research gaps and problems of focus show that the question of whether e-government leads to good governance has not been extensively discussed, although it is a pressing issue: donor countries and IDAs heavily sponsor and initiate e-government projects in LDCs, assuming – perhaps wrongly – that this leads to good governance. Further questioning the underlying assumptions with further research and empiric foundations is one of the key issues that need to be addressed.

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An Examination of the Literature on Civil Society Organisations and the Internet Artefact

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This paper reviews the literature on civil society organizations (CSOs) and the Internet artefact. There is much agreement and some (recent) dissent within the literature about the importance of the Internet artefact to and within CSOs. Much of the research has an undisclosed institutionalist framework which normalises the presence of the Internet artefact in the workings of CSOs without examining the process of institutionalisation. There is a slant to the ideological left in most research on CSOs and the Internet, and a number of authors employ the same examples in their arguments. This review examines these issues and offers suggestions for further research to address the institutionalisation of the Internet artefact in civil society organisations.

Introduction

One application of information and communication technologies (ICTs) is within civil society organizations (CSOs). This essay reviews the available literature on the Internet artefact and CSOs, and puts this research in context, examining its ontological assumptions. The literature demonstrates an ongoing debate about how Internet artefacts can be used by CSOs. The authors ask *how* CSOs should adopt the Internet, but they do not question *if* they will adopt it. Thus, most authors agree with and contribute, albeit unconsciously, to the institutionalisation of the Internet artefact within CSOs.

Although some of the newer literature draws on critical theory to examine the Internet artefact and CSOs, there is an “administrative” viewpoint pervading many of the works (for an explanation of critical vs. administrative research, see Lazarsfeld, 1944). The authors Cleaver (1998) and Whaley (2000) examine how CSOs can effectively adopt Internet artefacts to advance their missions (by increasing membership, engaging members in action, etc.). While this will likely be appreciated by those working for CSOs, there is a need to examine more critically this underlying institutionalisation of the Internet artefact, and the impact this normalised view has on further critical research. Do we assume, as Moore (1999, p. 41) does, that “the power of the Internet for real-world group organization has been tested and proven,” or do we take a broader view that activism “will not be extended merely through the diffusion of a new technological artefact” (Dahlberg, 2001, p. 630)? The authors make ontological assumptions: how the Internet artefact should be adopted is in question in the literature; the adoption (institutionalisation) of the Internet artefact is not. Only a small fraction of the more recent literature identifies this embedded institutionalist viewpoint; the authors largely fail to acknowledge their part in the institutionalisation of the Internet in CSOs.

Definitions

This review uses Garrido & Halavais’s definition of a CSO as an “activist NGO” with a “particular social mission” that is “non-commercial”, “non-governmental” and “specifically engaging in activism” (Garrido & Halavais, 2003, p. 174). Likewise, this essay draws on Avgerou’s (2002) concept of institutionalism as a normative process through which ICT artefacts become accepted as fixtures in organisations.

There is a lack of consensus on what constitutes the Internet artefact. Many older works (Pal, 1998; Diani, 2000) focus heavily on Usenet, listservs or bulletin boards (through which users can post comments on a website or email list for others to read), while a small number of more recent works (Clark & Themudo, 2003; Chadwick, 2006) focus on the Internet or online communities as the important Internet artefact. This review includes the range of Internet-enabled ICT artefacts (email, listservs, online communities, websites, etc.) discussed in the literature.

Organizing Vision

The literature demonstrates the emergence of an organizing vision: a “focal community idea for the application of information technology in organizations” (Swanson & Ramiller, 1997, p. 460) of CSOs and the Internet. By framing this debate in certain ways, the authors are not only engaging in the debate; they are shaping it. Diani (2002) argues for a technologically determinist point of view, noting the Internet “improves the effectiveness of communication dramatically, and in doing so it often makes the very existence of these [activist] networks possible” (p. 395). Clark (2003) notes that the Internet enables activism across national borders, giving rise to “virtual CSOs” and “dotcauses”, thus arguing that the Internet changes the nature of activism (p. 2-3). The “grandfather” of the virtual community, Rheingold (2002), posits that new kinds of political organizing are not possible without Internet-enabled technology.

The most vocal proponent of the benefits of the Internet artefact for CSOs is Cleaver (1998) who argues that Internet-enabled communication was behind much of the success of the Zapatista movement in Mexico. He argues that this success made other CSOs examine the ways they could use the Internet and ICTs to reach organizational goals. He further argues that the Internet is changing the ways in which CSOs are structured and the scope of their efforts, thereby changing the world order through Internet-enabled CSO action. However, he may be neglecting other factors which could also be influencing the success of CSO movements.

Interestingly, Ward (2005) embodies rather than identifies the underlying acceptance of technology as an autonomous player in this debate. In his study of political youth websites, he discusses how website users can sign up to “receive email from the website” (ibid, p. 242) rather than from *the CSO*

running the website. The important player becomes not the CSO (run by real people) but the technology itself. Thus, the Internet artefact creeps into the very conceptualization of who/what is in charge; it becomes not just a representation of the institution, but the institution itself, perhaps without our critical examination or consent.

Meanwhile, Pal (1998) notes that the key differences in discussions about the Internet and CSOs are questions about "the degree to which ICT" can make the CSO successful (Pal, 1998, p. 108). Pal examines *how* the Internet artefact may be used to help CSOs, but he is not critically examining the normalisation of the use of ICTs for activism. While Doctor & Dutton (1999) argue that there is "little empirical research" to support or refute claims of effectiveness of the Internet in the work of CSOs, they too adopt a normative view of the artefact: "technology can be viewed as being just as important to the social structure as laws, economic institutions or social beliefs" (Doctor & Dutton, 1999, p. 224). Rheingold (2002) questions CSOs' "uncritical embrace" of technology, calling for "an informed consideration of what we are getting ourselves into" (p. xviii). However, while he asks how CSOs should use the Internet, he reinforces the conclusion that CSOs must "get ourselves into" (institutionalise) Internet artefacts. These authors support the implicit organizing vision in which the incorporation of ICTs into CSO is inevitable.

In contrast, a few authors do problematise this technological determinism. Wilhelm (1999) notes that the "causal story of ubiquitous access to technology leading to an expanded interest in political matters...is accepted, almost with blind faith, although there is scant empirical evidence" to back this up (Wilhelm, 1999, p. 157). Whaley (2000) notes that Internet artefacts do not create successful activism or social justice of their own accord; they are not imbued with democracy. Coleman (1999) echoes this, noting specifically that there is a "technological determinism" behind the idea that Internet artefacts "possess inherently dialogical, democratic and libertarian characteristics" (p. 197). Chadwick (2006) is the most explicit in addressing these larger questions of institutionalisation, arguing that ultimately society chooses and designs tools that carry or shape social meanings.

Examples

Specific theories provide examples of the technologically driven and institutionalised nature of the debate about CSOs and the Internet artefact. The resource-based view (RBV), which examines the Internet artefact as a tool or asset of the CSO, is employed in a number of sources. Cleaver (1998) focuses on the importance of the speed and constant availability of the Internet in fact-checking information. Dahlberg (2001) notes that CSOs must "compete" with corporate "activist" websites which are also using Internet-enabled tools (Dahlberg, 2001) to attract users. Whaley (2002), from an administrative perspective, focuses on the Internet artefact as a tool, arguing that CSOs need to determine their organizational strategies first and adapt internet strategy around these strategies. Clark & Themudo (2003) discuss the importance of Internet communication in reducing costs, hinting at transaction cost theory.

In a more critical vein, Silver (2003) notes that previous research has focused "more on what politicians and political parties on doing *with the Net* and less on what citizens and

activists are doing *on the Net*" (Silver, 2003, p. 280 - original emphasis). This view, paired with Chadwick's, could break the institutionalist domination by viewing the Internet as a *space* rather than as a *tool*. However, the idea is not developed further. McCaughey & Ayers (2003) problematise the RBV by asking if the Internet is "for protest" or merely to "support protest"; in other words, is the Internet artefact an actor in itself (hinting at actor-network theory), or just a tool (McCaughey & Ayers, 2003)? In turn, Paragas (2003) asks if political movements use technology or are shaped by technology: "Mobile communications technologies and democracy perhaps reflexively define each other" (p. 259). (While Paragas (2003) is not talking about the Internet artefact per se, his comments are relevant as mobile communications are only possible because of other, Internet-enabled technical artefacts, and the dispersed and user-driven nature of mobile phone technology is mirrored in Internet artefacts such as email, IM and blogs. The lines between mobile and Internet artefacts, especially in regards to activism, are becoming increasingly blurred. The IS field would benefit from additional research on technological convergence as it relates to technology adoption in CSOs.)

Much of the newer research addresses the idea of "hacktivism" or "netwar" – direct activism which only exists inside the Internet. Cleaver (1991) defines hacktivism as "the use of modern computer technologies as weapons of criminal acts or political struggle" (p. 1). While Pal (1998) touches on this idea, it is only in more recent years that the idea of "hacktivism" has been extensively discussed in the literature by Rheingold (2002), Clark & Themudo (2003), Vegh (2003), and Chadwick (2006) among others. This is an example of how the research is evolving through time, focusing first on the ideas that the Internet artefact was going to change CSOs: "The rise in the visibility and density of these transnational social movements cannot be divorced from the communications technologies that have empowered them," (Deibert, 1998, p. 33), to a more critical approach of how the Internet artefact is both shaping and being shaped through its employment by CSOs. Garrido & Halavais (2003) discuss this through the example of the Zapatista movement, noting that the movement benefited from its use of Internet artefacts, but also that the movement served as a central organizing "node" for other activist networks, thus serving the network (the Internet artefact) as well (Garrido & Halavais, 2003). This moves the literature towards a more nuanced examination of the Internet artefact and CSOs, but it does not fully counteract the entrenched institutionalist viewpoint.

Recurring Themes

While the research is growing more critical through time, it would benefit from new examples and conceptualisations. Much of the research uses the same examples as the basis for examination; the repeated use of these examples limits and reinforces the dominant (technologically deterministic) viewpoint in the literature. Four of the sources deal heavily or exclusively with the Zapatista Movement (Cleaver, 1998; Clark & Themudo, 2003; Garrido & Halavais, 2003; Chadwick, 2006). Three of the examples use the overthrow of President Estrada in the Philippines as the basis for their discussion or as prominent examples (Rheingold, 2002; Paragas, 2003; Chadwick, 2006), and three sources discuss the WTO "Battle for Seattle" (Rheingold, 2002; Clark & Themudo, 2003; Chadwick, 2006). These examples highlight the bene-

fits of the Internet to CSOs; they reinforce the idea that CSOs must adopt Internet artefacts to be successful. These examples persist through time, despite the availability of newer, perhaps more relevant, examples, which might provide alternative conceptualisations of the Internet and CSOs.

Hanafi (2005), Ward (2005), and Chadwick (2006) offer a few of these newer examples. Hanafi (2005) profiles the Palestinian Scientist and Technologists Abroad (PALESTA) discussion list. Ward (2005) analyses a number of political activist youth organisations in the UK and Ireland during the 2004 European Parliament elections, and Chadwick (2006) includes examples from the Howard Dean presidential campaign in the United States in 2004, as well as MoveOn.org and the Cult of the Dead Cow. These new examples show an evolution, offering the ability to examine new applications of the Internet in CSOs, and also to see how, with the evolution of the Internet, the relationship between the Internet artefact and CSOs grows more interdependent and complex (Chadwick, 2006).

It is important to note the ideological bias of much of the research. There is a slant to the ideological left in the examination of the employment of the Internet artefact for "positive" action by progressive social movements, or "negative action" by "terrorist" or "right-wing" movements. Rheingold (2002) notes the potential for technology to be used for ill purposes, but does not examine his own bias toward which groups are "good" or "bad." He neglects to see how one person's terrorist group may be another's freedom fighter. A critical examination could lead to a more nuanced view of the employment of the Internet in all types of CSO movements. Silver (2003) recognizes this bias, arguing that there is too much focus on "cyberactivism of the left" and that there should be further examination of how CSOs on the right are harnessing Internet artefacts (p. 290).

A few sources examine embedded "western" cultural values of the Internet artefact in their discussions of the Internet and CSOs. Clark & Themudo (2003) discuss western cultural dominance and issues of the "digital divide" in the use of the Internet artefact, but they again simply accept that "dot causes" help to "democratize" activist movements (Clark & Themudo, 2003, p. 120). Salter (2003) also notes that the structure of the Internet is created from a western hegemony and may therefore be exclusionary to non-western audiences. Lebert (2003) goes so far as to argue that, "others will not necessarily welcome the values expressed on the Web – a medium that remains profoundly Americanized" (Lebert, 2003, p. 224). Despite their identification of these issues, these authors see the introduction of the Internet artefact as a necessary part of CSO development. They do not problematise the idea of a "digital divide", or examine whether non-western CSOs need to employ the Internet artefact to be successful. The institutionalist assumption is that CSOs must employ the Internet. The authors unconsciously narrow their focus to examine ways to counteract a bias they see as a negative by-product of the advantages of the Internet artefact, but they do not question the existence of these biases or the propagation of the Internet artefact itself.

Conclusions, Limitations and Further Research

As Silver (2003) argues, the Internet is "a historical construction" (Silver, 2003, p. 283), and it will evolve in the coming years. Research on CSOs and the Internet artefact must

evolve with it. Much of the research on the Internet and CSOs has an undisclosed institutionalist bias. Although the authors claim a neutral viewpoint, their arguments reinforce the idea that Internet technology is necessary to the success of CSOs, or at least that it must be considered as a tool. The research largely focuses on how the Internet artefact can be employed by CSOs, and on whether the Internet has a positive or negative effect on CSOs (and vice versa). The ideas that (1) the Internet artefact shapes CSOs and (2) the inevitability that CSOs will employ the Internet artefact are not generally in question in the literature. Rheingold (2002), Chadwick (2006), and McCaughey & Ayers (2003), among others, dissect the Internet artefact in minute detail, but assume that the institutionalisation of the Internet artefact is inevitable. There are a few exceptions to this view. Whaley (2000), for example, notes that CSOs should focus on "building new kinds of international thematic teams through the Net without letting it [the Internet artefact] dictate....organisational strategies" (p. 40). As Silver (2003) notes, "scholars' framing of these movements will impact the movements" (p. 288). These authors challenge the assumptions outlined above, but their voices are outnumbered by those writing from a technologically deterministic point of view. For the research on CSOs and the Internet to evolve productively, more research is needed to explicitly address this normative issue and to examine how and why ICTs become institutionalised in CSOs.

The IS field would benefit from broader research on the Internet artefact and social CSOs, such as Amnesty International or Oxfam, rather than its current focus on political CSOs. There is also a lack of published research on CSOs and newer technology, such as online communities. Instead, much of the literature focuses on listservs or other older technologies. Lastly, the field would benefit from broader research that includes multiplicities of actors with varied (non-economic) goals. If, as Salter (2003) argues, "the Internet can be seen as a foundational medium for civil society," (Salter, 2003, p. 129), then we need to better understand the complex interaction between civil society (CSOs) and the Internet.

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Guilty Until Proven Innocent

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Often and quite appropriately dubbed as Big Brother, Biometric technology is finally taking off the shelves. Biometric technology involves recognizing humans based upon specific behavioral or physical traits. It recognizes these unique characteristics and then uses them to verify the individual's identity. Primary biometric disciplines include fingerprinting, facial recognition, voice recognition, iris recognition, palm scan, retina scan, hand geometry, signature-scan, keystroke scan and body movements. Fingerprinting is the largest segment accounting for almost fifty percent of biometric technology.

Why Biometric Technology?

Recent tragedies such as 9/11 (the 11th September, 2001, terrorist attacks in the United States) and more recently 7th of July (the London terrorist bombings) attacks have magnified the necessity for higher security standards. Aftermath 9/11, the United States government has become a strong proponent of utilizing biometric technology to address rising security concerns especially in areas such as visas, immigration, and government identification cards. Other governments of countries such as Australia, Germany, Israel, etc. have followed suit and have made significant investments in border and passport security projects. Common identification methods involve identification card, personal identification numbers, passwords etc. The keen interest in biometrics stems from the fact that it is so closely bound to a person i.e. unique. The likelihood of it being lost, stolen or falsified is considerably lower.

The hype that surrounds the use of biometrics for security measures is nearly a decade old. It was often believed to be a technology propagated and driven by governments, and thus confronted with concern from the general population who viewed it as an infringement on their privacy. For instance, biometric authentication uses personal data that is intrinsically linked to the individual and hence is a favorable medium of security within public domain applications. Such applications involve both governments and common citizens. While the government owns the technology, the citizen finds him or herself targeted by it! This is bound to create a rather delicate situation where the applications are often scrutinized as well as highly accountable for both the government security and that of the public. Biometric data are so personal to an individual, making security of this data a primary issue. While the biometric system itself needs to be secured, the users must also be protected from the possible divulgence of their personal data to third parties. Such public domain applications are spread over the globe which results in sensitive data (biometric or other personal data) being transmitted over the internet or across other unprotected communication links. Illegal acquisition of this data will pose serious threats to operational security.

Post 9/11, severe security measures were implemented within

the USA's 115 international airports and 14 major seaports. All international travelers belonging to the visa waiver program (VWP) countries (Australia, Sweden, Germany, France etc.) now require machine readable passports that consist of biometric data (an e-Passport) if they wish to travel without a visa on the VWP. While air travel has become more complex and tedious upon introduction of additional security checks, the public is now reassured of the drastic measures taken by the government to protect them from terrorist activities. Another area of biometric usage by governments is that of e-Borders. This relates to the use of IT and security measures for modernized border control. Biometrics for passengers upon entry into the country, are collected and then used for surveillance and profiling of passengers. The USA launched project US-VISIT in which customer profiling begins overseas in the US consular offices. While issuing visas, biometric information such as digital fingerscans and photographs are checked against a database of known criminals. Upon entry into the USA, the fingerscans are verified to ensure that the same person who was issued the visa is now entering the country. The UK followed suit with project Semaphore to facilitate cross border information sharing. Information of such mammoth proportions may cause more and more people to be turned away at the border. In the case of Yusuf Islam (former singer Cat Stevens) was deported to London from the United States when his name popped up on the no-fly list. In an interview on Larry King Live (7th October, 2004), Yusuf Islam mentioned that the border officials confused him with a man on the no-fly list named "Youssef Islam". While biometric technology may ensure prompt security clearance of low risk passengers there are bound to be many more innocent passengers that are unjustly denied entry! Both projects have received much flak from privacy groups and human rights groups. Fingerprinting all visitors to the USA is viewed as criminalization of non-Americans. Meanwhile the US government gaining access to airline reservation databases was opposed by airlines, NGOs, and the European Commission based on costs, civil liberties, and privacy respectively.

Another outcome of the biometrics – government association has been the National Identity Card saga in the UK. Biometric ID cards contain biometric information such as facial recognition, iris scans and digital fingerprints and various other personal details all on a single card. If the government were to have its way, all this information would be stored on a central database that is easily accessible to the government, police, immigration, inland revenue service and national intelligence services. This move has been widely criticized, most vehemently by the London School of Economics. Professor Angell from the department of Information Systems at the LSE perceives this to be the last of the big government IT projects as he claims it will result in "diabolical shambles". Simon Davies (visiting professor, LSE) slams the project on the basis of high implementation costs which will eventually be borne by the tax payer. Others view the compulsory Na-

tional Identity Card as a compromise of the British tradition, civil liberties and privacy. Meanwhile the British government, led by Prime Minister Tony Blair, has maintained this as an issue of “modernity” rather than civil liberties in order to track issues such as identity fraud and terrorism. The questions we are left with are:

Are National Identity cards just another document for miscreants to forge?

In May 2003, the International Civil Aviation Organization (ICAO) approved facial recognition as the global standard of biometric data. Image recognition has never been a human’s greatest asset and hence it is less so for machines. The expected error percentage may vary between 5% and as high as 40%. Professor John Daugman (Cambridge) describes the performance of the computer algorithms for face recognition as “appalling” in terms of accuracy. The slightest variation in facial expressions, pose angle, or the viewing angle may have detrimental effects on the accuracy of the computer algorithm.

Are all citizens guilty until proven innocent?

Professor Daugman mentions the key strength of biometrics in being able to recognize individuals based on the degree of randomness and complexity that biometrics contains. This explains the unreliability of face recognition where the degree of randomness is far lower than that present in fingerprints or iris scans. The iris is associated with almost 249 degrees of freedom as compared to the 20 degrees of freedom of the face. The one thing that is certain is that every technology brings with it a degree of uncertainty. No biometric can offer 100% accuracy. There will always be a margin of error. All biometric data collected will be stored in databases. But in order to match this data against criminals or terrorists, the terrorists must at first be registered within the database as terrorists! While there are a certain number of known terrorists, it is likely that a majority of them haven’t been discovered yet.

Easily inferred, major obstacles to public acceptance of biometrics are security and privacy-related issues. Information technology provides features such as Public Key Cryptography to enhance security but there is also a human factor involved: certain staff will have access to the biometric databases and hence it is absolutely essential that they are trustworthy. Illegitimate changes to the database or incorrect changes will have drastic effects. Other methods of security are periodic security audits and liveness checks which attempt to detect features such as response to stimuli (light, electrical pulse), thermal measurement, moisture etc. This makes one question the advancement of technology, does technology cater to external causes that may influence our response to stimuli. E.g. will our reaction to light or electrical pulse be same under influence of alcohol or drugs? Are machines intelligent enough to detect the difference?

Biometric security - boon or a bane?

Biometric technology uses a ‘two factor’ authentication: it relies not just on something we know (PIN or password) but also on something we possess. Therein lies the allure of this technology: it is believed to be a technique to combat online crime or identity theft. Voice verification systems are being adopted for telephone banking procedures within the banking industry. Laptops are beginning to be equipped with fingerprint readers. Biometrics is also used for safety locks in safes,

houses, garages etc. Following the success of the i-Mode in Japan, m-commerce has taken a huge leap worldwide. Users can access websites, send e-mails, mobilize funds between banks and even shop online using their mobiles. The Achilles heel in this case is the mobile application. SecureTest (security consultancy) demonstrated the security perils of such applications where hackers can tap into the mobile phone application, modify the code, and ultimately manipulate the website itself. This is witness to the fact that the improbable has now turned possible! Biometrics such as fingerprint readers are now being used to secure mobile transactions. In an era where mobile phones are synonymous with monetary transactions securing one’s handset is of primary concern.

Biometrics may enhance security but a major impediment to a biometric is that once it is compromised, it has been compromised for life! Unlike other modes of security such as passwords, PINs, etc., which can be changed periodically, a biometric is unchangeable. Stolen biometrics can lead to catastrophic outcomes because biometric features such as fingerprints are not easily changeable and hence may plague the victims for decades. There is always a threat of biometric information being grazed and used to identify people which may then lead to criminal acts such as kidnappings. In Malaysia (2005), four armed gangsters attacked an accountant in the suburbs of Kuala Lumpur in order to steal his Mercedes S- Class. But upon acquisition of the car they realized the car was operated by a fingerprint recognition system. So they stole the car and left the victim stripped naked on the road, but not before they cut off the tip of his index finger in case they needed to disarm his immobilizer at another time. In 2006, popular television show *Mythbusters* attempted to break into a laptop and security door armed with biometric authentication. Trespassing the laptop proved slightly more arduous but the security door was opened 3 times using 3 different techniques in less than 10 minutes! The security door was armed with a fingerprint reader which also measured pulse, sweat and temperature (i.e. live sensing). A licked latex copy of the fingerprint was all it took to dupe the machine. This does pose a startling question:

Are biometrics as reliable as a strong form of authentication?

While there have been considerable legal, security and policy implications, there have also been cultural and social issues related to the implementation of biometric technology. There is a perception that with the introduction of biometric technology our society will soon transform itself into a surveillance society. Fingerprinting children at UK schools was not received kindly by social groups and parents. While the Department of Education and Skills maintains that this biometric information is only used to make school services such as libraries and canteens function more efficiently, the parents and other social groups believe this is conditioning students to develop a casual attitude towards biometric information which in turn will lead to increased identity thefts.

For every biometric there will be a certain group of people who are physiologically unable to use the technique, for example, an arthritis patient is unable to place his/her finger flat on a fingerprint reader. Sometimes there are apprehensions associated with the use of certain technologies: the initial retina scan was often feared because people were intimidated by the proximity of machines to their eyeballs. Other factors and issues that may deter the acceptance of biometric technology

are those of hygiene: there may be general discomfort while using fingerprint scanners or placing one's face against a machine during a retina scan that we know to have been used by numerous people before us. There may also be certain religious reservations, because in some religions imagery is forbidden.

Earlier market predictions often expected the government and financial sectors to lead the biometric markets in annual revenues. However, recently there has been an upsurge in the usage of biometrics for commercial purposes. Owing to a low product demand as a consequence of government expenditure, a number of vendors are now exploring the commercial possibilities of biometrics. A very common commercial use is that of finger scans or palm scans at supermarkets used in tandem with a PIN, which eliminates the use of credit and debit cards and also results in shorter queues. The fingerprint and the PIN are then searched against a central database before the transaction is authorized. While this is rather convenient, it seems less secure. But it is argued that this level of security is more than adequate while shopping where the scanner is constantly monitored by a shop employee and hence any suspicious action will be recognized almost instantly.

An interesting observation is the response of the general public. While the usage of biometric technology by the government has been constantly opposed and looked at with suspicion, the commercial use of this technology has shown a steep increase. The largest commercial application of biometrics within the United States is Disneyland, where, in order to combat ticket fraud, they have been constantly recoding the geometry and shape of fingers into the ticket as opposed to photo identification which is more time-consuming. Following a technology upgrade, they now use a more sophisticated scanner which scans a single finger to obtain relevant biometric information. This has further reduced customer wait times. It comes as no surprise that post - 9 / 11 the US government requested Disney's advice on biometric security.

It is estimated that in USA more than 3 million people currently pay for goods using fingerprint biometrics. The only logical reason for this display of double standards is that the commercial applications of biometrics provide direct benefits and incentives to the customer. While governments battle public resistance of identity cards and e-passports, customers seem to willingly embrace commercial applications. It might be an interesting point for the government to note: on the commercial front, all it took for the biometric technology to sway customers in their favour were a few personal benefits and shorter queues.

The governments have knowingly or unknowingly cast a shadow of fear over its citizens. It is the State of fear. The State uses fear as an instrument to ascertain or validate its existence, and is at liberty to make arrangements to protect its citizens, even at the cost of their comfort. If it was cold war in the last few decades, today more current events like terrorism and Islamic fundamentalism are used to instill the fear factor. We are being changed into a surveillance society and like many other things in our life; Biometrics is advancement in science which infringes into our personal domain. Whether reservations raised by civil liberties/human rights groups are valid or not, whether the biometric technology is fool proof or not, the technology is here to stay. Today we are asked to divulge personal information such as fingerprints and retina

scans for security purposes, so it would be reasonable to assume that within the next decade we could be asked for DNA. Previously, fingerprinting and DNA analysis were associated with criminals and crime scene investigations but today the same is expected of an ordinary, law abiding citizen. This brings us back to the same haunting thought – Are we guilty until proven innocent?

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From Burnt Offerings to Chip and PIN

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They have an annual budget of \$48 million, \$26 million is pulled in from the main revenue stream and \$20 million from other sources such as consulting and merchandising. A Harvard MBA was recently recruited to lead the consulting arm and a former McKinsey & Co. Consultant was hired to manage day-to-day operations – this is the face of a modern church in America.

For the good majority of us, a church is a relic of the past reminding us of tattered Bibles, hard uncomfortable wooden pews and sleep-inducing sermons. For someone to then make an association between church and technology would seem ludicrous. However the Evangelical movement proved otherwise. Many evangelical churches are now equipped with surround-sound systems, and their rock bands have replaced hymn books and choirs, like Charlotte Church turning into a pop-star (no pun intended). A lot of churches have websites and blogs, or at least their members can receive newsletters via email.

Implementation of new technologies in churches gained significant interests from the youth members of the church because modern church environments are more in line with the environment that we live in. As a young ‘churchgoer’ myself, I prefer a Christian rock band to a boy-soprano, and would rather read off the screen than look up Malachi 3:5 in the Bible. However, passing around a credit card reader instead of a giving plate is an alarming thought.

E-mails and blogs are old news. It is time to examine some of the most recent technology advancements in the house of worship.

Does God accept credit cards?

Many churches around the globe have adapted e-offering scheme allowing members to give their offerings either via their websites, or direct transfer to the church bank account. Such methods of offering do not necessarily force the members to tithe or donate to the church. For some Christians, tithing is an essential part of their life, which they strongly abide to (and let’s not question their faith). A member who cannot attend their church for personal reasons can, therefore, use the e-tithing facility in order to fulfil their religious beliefs. Offering is a necessity from churches’ point of view, as the money given can be used to sponsor missionaries in rural parts of the world, help the poor and so on. Offerings, in general, are not asked for in an explicit way in any church, at least until one particular pastor came into ministry.

Pastor Marty Baker of Stevens Creek Community Church (SCCC) in Georgia, U.S., took a rather controversial step toward offering. Instead of relying on the internet, he invented a machine called Giving Kiosk, which he calls an ‘ATM for Jesus’. In effect, it is a self-pay-in machine, similar to those found in commercial banks. Three machines are placed at the entrance of Baker’s church and with help from his wife, the Bakers established a for-profit company, “SecureGive”. Giv-

ing Kiosks currently sell at \$2,000~5,000 depending on their configuration, and the Bakers also charge \$49.95 per month for maintenance. 1.9% of each transaction goes to credit card companies and a small cut goes to SecureGive. Seven congregations have now purchased the machines and Bakers expect their profits to rise in the next few years. However this process was not without its backlashes and criticisms, usually from the older generations who termed the machine as ‘crass’. Some found the presence of the machine offensive to the ministry.

Not having to carry around cash, ease of claiming tax-return and of course, earning mileage by using credit cards are huge attractions. However, using credit cards also have other implications especially for the young people, such as impulse buying and increasing debt. A recent survey conducted by the Department of Education and Skills showed that 40% of 16 to 21-year-olds in the UK did not know what an APR was. Moreover, half of the parents interviewed did not even know that students could get credit cards. Credit card companies are hugely profitable businesses, so who is the beneficiary here, God or Visa? Members of SCCC have to walk past the Giving Kiosk as they enter the church every Sunday. It is essentially a parking ticket machine that says ‘Giving Kiosk’ instead of ‘Pay Here’.

Doing it the American way: ‘super-size’ churches

So where does all that money go? Growing the size of the church is a desire that any pastor has in mind. The size of a congregation can vary from as little as two (the pastor and his wife) up to 50,000! Business tactics provide an initiative for those who wish to experience double-digit growth and it certainly is the trend we can see all over the world. There is already a big pool of well-established church consultants providing business tactics to create a so called *megachurch*. John Vaughan, the founder of Church Growth Today, has been studying growth and emergence of megachurches for over a decade. In 1990, there were 250 churches which had at least 2,000 members, and the figure had increased rapidly to 740 in 2003.

Technology has been the main driving force increasing the size of congregation and is depicted well at Lakewood Church in Houston, Texas, which currently holds the largest congregation in the US. Pastor Joe Austin quit college in 1981 to set up a television ministry which managed to air in 140 coun-



Giving Kiosk in Stevens Creek Community Church

tries. He continued and expanded his media strategy by negotiating with the top four networks spending \$12 million and thus allowing the program to be seen in 92% of American households today. The church not only has a 12-piece stage band, but also has a lighting designer



Lakewood Church, Houston, Texas

who sets the 'holy mood' and three large projection screens. The church has found a new home recently in Compaq Centre, better known as the former stadium for Houston Rockets basketball team. The executive director of the church, Duncan Dodds, made sure that the services "feel like a concert". \$90 million dollars have been spent on renovation work and the result, as shown in the photograph, is somewhat different to a conventional church. There are two artificial waterfalls located on both sides of the main stage, a state-of-the-art surround sound speaker system, huge LED screens just above the stage and the church has enough capacity to accommodate up to 16,000 people. The fact that the number of attendees has grown from 6,000 in the year 1999 to over 30,000 today proves that the technology in Lakewood has certainly played a significant role in spreading God's message to as many people as possible. Of course not every church in the world is as magnificent as Lakewood, but many look up to them and aspire to be like them. Is the dramatic growth of size and number in Lakewood a God's blessing or is it merely an act of an obsessive technocratic pastor?

Speaking of mega-churches, the name 'Willow Creek Community Church (WCCC)' in South Barrington, Ill., is as powerful as Nike in America, according to BusinessWeek Online. It is the most high-tech church in America and the Director of Information Technology at Willow Creek even introduced a fingerprint scanner for middle-school students and smartcards for the parents of some 3,000 accommodated children. Pastor Bill Hybels had carried out a market research prior to establishing his congregation and found out that the main reason for decreasing level of church attendance throughout America was that the symbols of a traditional church scared away non-churchgoers. It explains why the Bibles, stained glass, or even a cross and other Christian symbols are nowhere to be found in WCCC, and also why the building looks more like a shopping mall than a church.

Interestingly enough, there is a commonality among these mega-churches.



Willow Creek Community Church, South Barrington, Illinois

That is, their doctrine emphasises heavily on increasing 'material wealth' through faith in God. Pastor Austin of Lakewood Church exemplifies his wife's wish to buy a fancy house and how the couple was able to buy one through their strong faith. Pastor Creflo Dollar of World Changers Church International owns two Rolls-Royces and travels in a Gulfstream 3 jet.

Saddleback Church, the tenth largest in America, has also benefited from the use of technology. Pastor Rick Warren's newsletter, Ministry Toolbox, reaches 100,000 pastors worldwide through his website 'Pastors.com'. The site was also used to attract 1,562 churches to participate in "40 Days of Purpose", an event based on his NY Times bestseller, *The Purpose Driven Life*, which hit the mass-market retailers such as Wal-Mart, Costco Wholesale and Borders Group. At least his earnings did not end up in Rolls-Royce but back into the church.

Businesses around the world worship only two things: money and technology. Business consultants blinded most CEOs in the world to believe that technology will bring success. Pastors have now tasted money and technology. Who made them cross the line?

Doing business with God

Enterprise Church Management System (eCMS) – with its name alone already breaks the ice between religion and business. The church-turned-business, Fellowship Technologies, L.P. provides eCMS to churches in America. "...*His church should not have to 'get by' with less than the best technology has to offer*", says Jeff Hook, the CEO of the company. According to his words in the whitepaper titled, "Re-thinking Your Approach to Church Technology", the system has three important objectives which are: building trust regarding childcare; management of requests for prayers; and attendance checking system to check if anyone is ill so that home-visits can be arranged. He claims there are many others that the system can address that have mainly to do with 'convenience'. He tries to convince the doubtful readership by listing the above three key objectives, which sound very nice and caring indeed. But the content on the corporate website entailed a somewhat different nuance. It seems that maximising giving (profit, in business sense) and minimising 'walk-outs' (staff turnover) are the main targets of their Fellowship One system.



Jeff Hook, CEO of Fellowship Tech, LP

Kingdom Ventures Inc. (KV) was once the fastest growing publicly traded company whose sole mission was to help churches increase their size and show their presence through media and communication technology. "*One of the reasons megachurches are as big as they are now is because they use the technology of today*", says CEO Gene Jackson. He thinks churches should become more entrepreneurial and engage with non-church groups to encourage marketing and public relations to attract people. *PastorPreneur* is a book published by KV to guide pastors to do exactly that. So what was KV's destiny? The company started showing cracks when it acquired Christian Times newspaper, the largest Christian newspaper press in America. However, KV had only bought the trademark which meant that the content and the quality were

not to stay the same. KV went on to promote their paper using the name Christian Times and its long-established and well-recognised affiliates. The company was brought to a complete halt when one of the affiliates, Evangelical Press Association, reported an incident where their name was misused by KV, further contributed by the arrest of Gene Jackson for embezzlement. Mr. Jackson was put behind bars and Kingdom Ventures Inc. has changed their name to 'Denim Apparel Group Inc'. Yes - the company ditched God.

Fight against corruption

All of the aforementioned cases of technology-deterministic churches were driven solely by their pastor's burning desire to grow, expand and sell his church, a desire that perhaps every corrupted heads of His church in the past had in mind. Anonymous payments are very common in church offerings. From time to time they come in a form of cash donated by deceased individuals. Pastors are human beings after all. Sitting on thousands or perhaps millions of pounds that is untraceable may cause him to think twice about his faith. This is one of the reasons in favour of using electronic transfer (though there have been cases where pastors made withdrawals from church bank accounts and attempted to flee the country, most of them have been captured and prosecuted). Electronic transfer puts the money directly into the church's bank account so the members are assured that their money is not snatched in the middle. Indeed, a new era of church practice has emerged as a result, a society based on credibility and transparency, a close resemblance of what we see in the business community and it surely is not a pleasant sight to watch. Two megachurches are being established every week in America and millions of dollars circulate in these churches. At this rate, I can safely anticipate that auditing companies will join in the game in the coming years.

Final thoughts

Churches evidently want to look like businesses. On the other hand, some even say that large corporations have so much to learn from megachurches. Imagine a corporation whose economic resources are simply put in their pockets at no cost, and all of their staff working for free! In effect, this was the basic launch model for religious sects such as the Unification Church (a.k.a. the Moonies) and the Church of Scientology.

Can you be 'worldly' and 'holy' at the same time? No matter how these terms are interpreted, explained and justified for their co-existence, whether theologically or scientifically, I believe it is merely an act of self-justification for those who desire to be both.

"No one can serve two masters. Either he will hate the one and love the other, or he will be devoted to the one and despise the other. You cannot serve both God and Money." (Matthew 6:24)

What saddens me the most is that history seems to repeat itself. During the days of Martin Luther, the Pope had the power to the sale of 'special jubilee indulgences' (which lasts for ten days) and the money was used to build the symbol of the Catholic church: the magnificent Saint Peter's Cathedral in Rome. Luther, disgusted by the twisted doctrine which told people that the Pope can sell tickets to Heaven, initiated Reformation which gave birth to Protestantism. Today, these Protestants are repeating precisely what Luther had criticised

as an error, using other means of collecting money. Credit cards are predominantly used for purchasing goods, and I cannot get rid of the image of buying my way into Heaven.

It is neither my intention nor wish to depict technology as devil, but rather, as a facilitating mechanism of serving the root of evil i.e. *love* for money. Already, a vast amount of scepticism, controversies and criticism surround Christianity today, and those 'pastorpreneurs' are not doing any good for the situation.

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 Saddleback Church: www.saddleback.com
 Fellowship Technologies: www.fellowshiptech.com

See also:

NIV Bible

About the author

Hokwon was born in South Korea and moved to the UK when he was 12. He completed a BSc in Engineering and Business Studies at the University of Warwick, before pursuing a Master's degree at LSE. His MSc dissertation will be on Risk-based Approach to Anti-Money Laundering, with focus on the role of technology.