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Endless Bad Projects or Evidence-Based Practice? An Agenda for Action

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Abstract. This short position paper promotes the need for more evidence based practice to underpin the successful execution of information systems (IS) projects. This research responds to the high numbers of IS projects that are seen to have failed in terms of either one or many success criteria such as: not meeting original objectives, running over budget, negatively impacting on people, processes or organizations, to name but a few. We advocate the need for the development of a more rigorous evidence base for IS research similar to those used in medicine or more recently in social studies and software engineering. For example, Systematic Literature Reviews (SLRs) and also Meta-Analysis of empirical research studies could be used more extensively within IS to compile more coherent, consistent and referable bodies of evidence and knowledge. We conclude with a 7 point action plan and suggestions for further research.

Keywords: Evidence-Based Practice, Qualitative Research, Systematic Literature Review, Information Systems Failures, Research Methods.

1 Introduction and Background

There have been many information systems (IS) project failures. In the UK, the most detailed analyses of what went wrong tend to be those concerned with public sector IS failures. Taxpayers' money has been wasted, and the existence of the Freedom of Information Act, a Free Press and bodies such as the National Audit Office and the Parliamentary Public Accounts Committee mean that it is hard to conceal the failure, the contributory causes and the amount of money wasted. Commercial and Private Sector failures are much less transparent and visible however, which makes them hard to research, access and gather detailed empirical data. This is often due to powerful corporate interests, strategic and competitive drivers associated with brand, quality and image, and also the ever present threat of litigation and negative impacts on service provision from IT suppliers, vendors and consultants. Examples of documented IS failures include:

- Student Loans Company. In 2009 a non-departmental public body of the Department for Business, Innovation and Skills took over from local authorities the responsibility for university students' loans & grants. Performance in processing applications and communicating with students was completely unacceptable, for example, in September 2009 (the start of the new academic year) 87% of phone calls went unanswered. Many students waited weeks or months for their financial support and universities had to use their own funds to issue emergency grants and loans (Collins, 2010; National Audit Office, 2010).
- FiReControl System. Part of the UK's fire & rescue service. The project aimed to replace 46 local control rooms with a network of 9 purpose-built regional control centres using a new national IT system to handle calls, mobilise equipment and manage incidents. The project was abandoned in 2010, £469 million having been spent, with no IT system delivered and eight of the nine new regional control centres remaining empty and an estimated £342 million long-term rental costs for the nine control rooms, which the government is locked into until 2033 (Hall, 2011; National Audit Office, 2011).
- Integrated Children's System. The IT system used by social workers and others in local authorities who are concerned with children and families services. It cost £30 million, and is supposed to help social workers record information about children and manage their case loads. Many problems have been reported, including that it does not help achieve the primary goal of child protection, and it was a contributing factor in the death of a baby (Ince and Griffiths, 2011; Wastell, 2011).
- Care Records Systems in the English NHS: As part of the UK government's highly ambitious agenda for transformational change across the National Health Service, the National Programme for Information Technology (NPfIT) launched in 2002 was seen as a central pivot for improving efficiency and effectiveness through the development of electronic patient records and an integrated care records system. Despite a massive investment of over £6.4 billion by March 2011 (NAO, 2011), the programme was effectively cancelled in 2011. Many problems with the programme were reported and many reviews undertaken by the UK government National Audit Office and more recently the Major Projects Agency. Despite the major failings (Currie, 2012) and massive waste of UK taxpayer's money, very few detailed lessons have been learnt, even though concern has been expressed about NHS IT strategy for over a decade (Wainwright and Waring, 2000; Waring and Wainwright, 2013), and no evidence base has been created to differentiate what made certain parts of the programme a success as opposed to high profile and very expensive failures.

2 Evidenced Based Approach

However, despite detailed scrutiny of such failures, the lessons do not appear to be learnt, and the causes of IS failure in one project are repeated in further IS projects:

“It is deeply depressing that after numerous highly critical PAC [Public Accounts Committee] reports on IT projects in recent years, the same mistakes have occurred once again.” (Public Accounts Committee, 2009)

Academic researchers have offered theories that would help predict whether a planned IS project is likely to fail (e.g. Goldfinch, 2007 Heeks, 2003), but again their advice appears to be either ignored or unknown by project clients and developers.

It is our contention that IS project failures will continue to be unacceptably high unless and until the IS profession and its clients adopt an evidence-based practice (EBP) approach, which in turn requires IS researchers to provide them with the necessary evidence to make informed decisions, and IS educators to instil the ethos of EBP in their students.

The concept of EBP was first developed in medicine, in the early 1990's. It was argued that too often clinical practitioners based their decision-making on habit, prejudice, consultant's authority or imperfect knowledge of relevant research. Better treatment decisions would be made if doctors searched the literature for the best available empirical evidence, critically evaluated the study methods to assess the validity of the claimed research findings, and combined this evidence with the values and preferences of their patient (Sackett et al 1996). Evidence-based medicine is now widely taught and practised, and has been called one of the 15 greatest medical milestones since 1840 (Montori and Guyatt 2008). Its scope has now moved beyond informing decisions about clinical treatments, to include the wider management and policy context of healthcare provision, for example, approaches to change organisational culture to improve healthcare performance (Parmelli et al 2011), or strategies for encouraging healthcare professionals to adopt information and communication technologies (Gagnon et al 2009). As evidence-based medicine developed, it was realised that practitioners themselves could not be expected to search for all the available evidence, assess its validity and synthesise the findings of the high-quality studies. Researchers were needed to carry out systematic literature reviews (SLRs) which find, assess and synthesise previous empirical studies, and a knowledge-base was needed to hold the SLRs, which capture the current state of knowledge on treatments, with summaries of the evidence for a non-academic audience. The Cochrane Collaboration (www.cochrane.org) was therefore established, a web-based knowledge-base which includes more than 5000 SLRs (Cochrane Collaboration 2012), with the main findings summarised in a form that practitioners and patients can read.

The idea of EBP has spread to other disciplines, including software engineering (Dybå et al, 2005), social policy (Pawson, 2006), librarianship (Eldredge, 2000) and education (Petty, 2006), and more web-based knowledge-bases have been established, including the Campbell Collaboration (SLRs in education, crime and justice and social welfare: www.campbellcollaboration.org), and one for evidence-based software engineering (www.ebse.org.uk). However, the adaptation and application of EBP, and especially systematic literature reviews for IS research, has not been without critique (Boell & Cezec-Kecmanovic, 2011; Cruzes & Dybå, 2011). This relates to distortions of the techniques from their original purpose, mainly related to the observation that IS can be seen as 'soft' or social science based, whereas medicine or software engineering are seen to be based on 'hard facts' or a greater reliance on exactness and objectivity. There was also a perceived lack of rigour relating to research synthesis, especially of empirical studies. This leads to an over-reliance on processes for literature identification and selection as opposed to placing an emphasis on the interpretation and understanding of the work itself.

Despite these criticisms, which we feel can be overcome, we contend that IS too should explore, develop and perform EBP, so that decision-making about IS strategies, designs, implementations and innovations draws on empirical research findings and previous lessons, rather than gut feeling, current fashion about the latest “silver bullet” or a belief in the “magic” of technology (Wastell, 2011). The EBP paradigm in IS would inform decisions about the design and adoption of new tools, methods, processes or socio-technical systems, because decision-makers would draw on the synthesized findings of empirical research studies into previous use of the tools, methods etc. and integrate this knowledge with their understanding of their local context.

To develop EBP in IS, the following seven-point agenda is proposed:

1. Empirical research into the design and adoption of IS strategies, tools, methods, processes or systems. The IS discipline has a long tradition of empirical research, so this objective is readily achievable.
2. Systematic literature reviews (SLRs). These aim to discover all relevant empirical studies (the evidence) via a transparent and repeatable process, and synthesize their findings. So far, relatively few SLRs have been conducted in IS (Oates, 2011).
3. A web-based knowledge-base. This would contain completed SLRs, with summaries for a non-academic audience. There have been previous proposals for such a knowledge-base to support EBP in IS (Atkins and Louw 2000; Moody 2000; 2003), but nothing tangible has endured. A professional body such as IFIP or AIS could take a lead here.
4. Knowledge transfer of the evidence (the findings of SLRs) to IS practitioners and other stakeholders. Some IS researchers have studied technological innovation diffusion, but translation research and knowledge transfer more generally, from IS researchers to IS practitioners and clients, is not well-developed in IS.
5. EBP in IS education. IS educators need to include EBP in the curriculum studied by our future managers, developers & policy-makers, so that they learn to incorporate empirical evidence into their decision-making, and so that they routinely collect data about their own IS projects, which can be added to the knowledge-base.
6. Evangelists for EBP. There have been some calls for EBP in IS (Atkins and Louw 2000; Baskerville & Myers 2009; Moody 2000; 2003; Oates et al 2012; Wastell, 2011), but more are needed, to raise awareness and lead the movement.
7. Research into EBP. Research is needed into: methods for synthesising previous research in IS which has a plurality of research methods and philosophical paradigms, effective dissemination approaches to help translate research findings into practice, and critical evaluations into the use of EBP in IS to understand the process, benefits and limitations, and to counter any unfounded claims of the evangelists.

3 Conclusions

Our own work presently falls within the action points one and two. In particular, the on-going development of a model-driven method for the systematic literature review of qualitative empirical research (Oates et al, 2012). In terms of our contribution to IS theory, we highlight how this might be used to explore more evidence based practice for the adoption of business process modelling notation (BPMN) methods in organizations. The approach can then be assessed for more generic and practical applicability within IS adoption and diffusion studies. This study was initially based on empirical research and then augmented with supporting evidence from relevant empirical research reported in the literature. The work is continuing and also being developed into a UK based research council proposal where we would aspire to develop a Web-Based knowledge repository; falling within action points three and four.

Following our seven-point agenda would enable the IS discipline to develop an EBP approach, and to assess the strength of our position. We do not assert that EBP is a silver bullet, guaranteed to prevent all future IS project failures. EBP has its critics too (e.g. Wastell, 2005; Boell & Cezec-Kecmanovic, 2011). But we do contend that EBP in IS offers the prospect of decision-making which takes account of previous lessons and experiences, rather than simply repeating the mistakes of the past.

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