

Association for Information Systems AIS Electronic Library (AISeL)

AMCIS 2007 Proceedings

Americas Conference on Information Systems
(AMCIS)

December 2007

Information Systems Evaluation: Mini-Track Introduction

Zahir Irani

Marinos Themistocleous

Brunel University, School of Information Systems, Computing and Mathematics

Peter Love

Brunel University

Edith Cowan

Edith Cowan University, School of Management Information Systems

Follow this and additional works at: <http://aisel.aisnet.org/amcis2007>

Recommended Citation

Irani, Zahir; Themistocleous, Marinos; Love, Peter; and Cowan, Edith, "Information Systems Evaluation: Mini-Track Introduction" (2007). *AMCIS 2007 Proceedings*. 367.

<http://aisel.aisnet.org/amcis2007/367>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2007 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

INFORMATION SYSTEMS EVALUATION MINI-TRACK INTRODUCTION

Zahir Irani,

Brunel Business School, Brunel University, Uxbridge, UK (zahir.irani@Brunel.ac.uk)

Tony Elliman, Marinos Themistocleous,

School of IS, Computing and Mathematics, Brunel University, Uxbridge, UK
(tony.elliman, marinos.themistocleous@brunel.ac.uk)

Peter E.D Love

School of Management Information Systems, Edith Cowan University, Western Australia
p.love@ecu.edu.au

Abstract

This short paper introduces the AMCIS 2007 mini-track on Information Systems Evaluation. In addition to reviewing the 13 presented papers it notes a shift in the area of interest to address Information Systems (IS) portfolio management and Information Lifecycle Management models. The paper also reflects on non-numerical research methods and exemplifies this from the VIEGO project. Three future challenges for IS evaluation are noted – producing the IS equivalent of audited accounts; evaluating cross-organisational infrastructure; and notions of non-cost criteria such as ‘green’ IT and social value.

Introduction

Information Systems Evaluation continues to be a popular topic for investigation. This is now the eighth year members of the Information Systems Evaluation and Integration Group (ISEing) have organised this mini track and it continues to attract good papers in sufficient numbers to fill several sessions. After filtering the abstracts we received some 17 papers for review and this year we have 5 sessions (13 papers), all presenting interesting and informative pieces of research. As in previous years we have prepared an introduction to the track to explore briefly some of our own concerns about the area and to guide you through the papers to be presented.

A shifting focus in evaluation

It has long been recognised that Information Systems (IS) are a strategic resource with a critical role to play in commercial success. However, the full implications of managing IS as a strategic resource still presents challenges. At a UK seminar¹ in December last year an international drug company stunned the audience by stating that well over half of their IT portfolio was being axed for failing to deliver value for money. The moral of their presentation was that even when post implementation evaluation showed positive gains these were not sustained in the longer term. Continuous monitoring of the corporate portfolio was needed to ensure systems carry on delivering benefits. Remedial action was reserved for those systems with significant potential value and the rest were to be abandoned or scaled down. This type of pro-active IT resource management makes its own demands on the evaluation agenda and this year sees an increase in the number of papers looking at portfolio management.

Another sign of maturity is the growing interest in document (or knowledge) management and the notion of Information Lifecycle Management (ILM). We have passed the point where online documentation is just an easy access mechanism for widely used information. In many cases ICT now provides not just access to information but it is the sole record of key strategic and operational information. Record based transaction processing systems have a long history and many lessons have been learnt in maintaining database integrity and security. Documentary systems don't fit very well into transaction technology and there is a need for systems to be built using alternative architectures. These again need appropriate evaluation and several related papers appear in this years programme.

Grounded research and social values

Two years ago we spawned a sister mini-track in the eGovernment area – e-Government and Public Sector Systems Evaluation. A significant element of our own research in the past year has been through project VIEGO (Irani and Elliman, 2007) which set out to identify relevant key areas for future research in eGovernment. The project was based on a perceived need to take stock of the achievement to date.

Most of the public sector projects, at least in the UK, have been developmental with a significant political drive to deliver on a short timescale. Their evaluation has been piece meal and somewhat limited. The main factor for assessing achievement in English local government has been a simple measure known as Best Value Performance Indicator BV157 (Audit Commission, 2002, p3). This just assesses the proportion of public services that are accessible online without reference to the quality or effectiveness of the provision. Other assessments, with a financial focus, have been made, for example, by the Parliamentary Office of Science and Technology (POST, 2003) and one public investment programme of over £20M (DCLG, 2006) has been “self assessed” in an interestingly novel online eGovernment website (Anon, 2007).

Of interest here is the assessment methodology adopted by VIEGO. In particular we wished to avoid the twin dangers of

- just getting the received political (or academic) ‘wisdom’, and
- loosing important insights by just taking a simple formulaic approach.

However we also wanted to deliver an evaluation backed by sound research methods. VIEGO set out to achieve this in a series of consultation workshops – two in London and one each in Cardiff, Manchester and Edinburgh. The workshops were carefully organised to stimulate a structured discussion between different groups of stakeholders with the researchers putting a minimum of content into the discussion. The intention was to uncover their views on current eGovernment initiatives and the issues and topics they considered to be important for practice in the future. All the workshop discussions were recorded and subsequently analysed following a grounded theory model.

The attendees for each workshop were self-selecting groups responding to open invitations to attend and the themes identified in different workshops were clearly influenced by the composition of each group. Overall the contributors ranged from

¹ IT and e-Government Services in 2010: What does the future hold? (a CIPFA-SOCITM Improvement through Technology Forum Seminar) held at BT's conference centre in London on 6 December 2006).

managers, public sector employees and independent consultants to local government officials, academics (as informed citizens) and elected representatives. The workshops included IT specialists and lay users; and covered both local and regional government. Prior to publication comments on the findings were sought from central government (The Cabinet Office) and national professional groups such as the British Computer Society and the Society of [public sector] IT Managers.

The full research methodology and set of findings are available in the VIEGO project report (Irani and Elliman, 2007). However, one of the outcomes was that although the need for financial efficiency was recognised, government is fundamentally a social activity. All participants were interested in getting a clearer view of what users of eGovernment services (citizens and businesses) want and how they may be evaluated and measured. At a deeper level participants wanted to understand how eGovernment is changing social structures and the implications for good governance.

This VIEGO result shows that there is a compelling need to understand the *social* value of action as something distinct from its cost. It justifies the decision to spawn a special mini track in the public sector area and emphasises the need to develop robust qualitative evaluation models.

The AMCIS 2007 papers

The first paper that follows up our introduction continues to explore the general area with a 10-year citation analysis of the “productivity paradox”. Wan, Fang and Wade explore for us the research literature that has emerged since Brynjolfsson and Hitt produced their much-cited paper in 1996. The notion that IT has produced a productivity paradox with increased IT spend yielding less and less return is a catchy idea upon which to open a debate and anecdotal tales of system failure lend credence to the idea. However, Brynjolfsson and Hitt question the idea and Wan et al suggest that the evidence has now mounted considerably against the notion of a productivity paradox. The issues for modern IS managers are now quite different.

In the last paper of our opening session Karr and Lu lead us to explore a different aspect of IT and productivity. The notion of knowledge workers (KWs – those whose main work is with information) has been with us since it was coined by Drucker in 1959. Based on a survey of several KWs, the authors suggest that a productivity paradox can still occur because the current plethora of IT solutions is actually having a negative effect on KWs productivity. KWs are not a homogeneous group (Elliman and Hayman, 1999) and IT can be based on an over simplification of the tasks they perform. Karr and Lu certainly point to the need to give closer attention to these issues and no doubt this line of research will yield more contributions to this track in future.

The business impact of IS development

Our second session presents three papers that could be described as dealing with the impact of IS developments on a specific business. In the first paper Jose Esteves presents a report of research in progress to improve benefits realisation in Small and Medium Enterprises (SMEs) adopting Enterprise Resource Planning (ERP) products. ERP products consist of a collection of linked IS business components that have a complex impact on an organisation. The aim of ERP is to provide an integrated solution drawing together these different aspects of a business. This paper suggests that ERP adoption in SMEs can’t follow the same route as a large scale enterprise and that an alternative roadmap is necessary. At this stage the relevant roadmap is tentative, based on student research, and further work is needed to validate it.

The next paper also looks at research with SMEs. This research with data from 41 Jordanian SMEs looks at the extent to which these businesses assess the operational effectiveness (OE) of IT projects. Al-Yaseen, El-Haddadeh, Al-Jaghoub and Al-Gweri report that many businesses make no form of OE assessment and that they miss the opportunity to realise the benefits others derive from such an evaluation.

The last paper of this session looks at a different business IS problem. Mendex, Perez and Mendoza examine the Oil Industry and the problem of selecting appropriate Economic Evaluation Tools as part of their Decision Support Systems portfolio. These tools help make decisions about the selection of various possible projects that a company might embark upon. The

approach taken in this paper is to develop model for evaluating the quality of these tools based on a basket of functionality, usability and maintainability metrics.

IT portfolio management

Our third session tends to focus on the issues of evaluating the corporate IT portfolio and selecting appropriate ICT services for the organisation. The first paper from Burke and Shaw looks at the relative merits of Real Option Analysis (ROA) and more conventional Discounted Cash Flow analysis. Working with empirical data from three large companies they examine the difference between the two approaches. Although ROA is theoretically superior they show that there are significant complexities underlying its application to real world scenarios in these large organisations. Given this insight several lines of further research are suggested.

Our second paper in this session comes from the same institution and further develops issues around IT portfolio management. In this paper Karhade and Shaw look at the project selection process from the perspective of risk management. In this context they explore the links from corporate strategy through to various aspects of IT Management. Using empirical data this study shows that the selection process is not a simple binary choice for each project. Rather, the list of available projects is pruned by making positive selection or rejection decisions while other projects remain on the table undecided. Each type of decision seems to involve different factors.

In the last paper of this session we examine corporate resources from the wider perspective of ‘Process Capital’. Shan and Wu take the definition of process capital as that accumulated know-how that enables an organisation to exploit techniques, processes and employee capabilities to enhance efficiency the delivery of a product or service. They postulate that the ability to measure process capital would aid managers in planning, managing and improving that capital resource. This includes the IT portfolio, which falls under the process capital umbrella. They use empirical data from 167 major Taiwanese companies to develop and explore this model.

Information lifecycle management

This session presents a series of three papers from the KOM – Multimedia Communications Laboratorie at the Technische Universität Darmstadt. In the first paper Turczyk, Liebau and Steinmetz present the basic model of Information Lifecycle Management as a strategic concept for the storage of information and documents. In this model different pieces of information are assigned different values that change over the document life cycle. This notion of information value provides the guidance for managing document placement within a multi-layer storage hierarchy that trades of quality of service against storage costs at different levels in the hierarchy. Since the value changes over time documents may migrate between storage technologies over their lifecycle and simulation results are presented to demonstrate design choices and the consequences of this behaviour.

In the second paper Marcel Gropf joins the these three authors to look specifically at the key question of how an individual document can be assigned a specific value at any point in its life cycle. Traditional methods require the collection of metadata to enable a notional “cash” value to be calculated. However, collection of the metadata is time consuming and can be problematic when managing a large corpus of documents. The approach taken in this paper develops an alternative notion of value based on the likelihood of further use. The authors present a demonstration of this technique using data from a major German company. In the third paper Martin Behrens now joins the first three authors to extend the simulation to specifically explore the manor in which technology and operational costs affect the design of an ILM system.

Customer Value

The last two papers for 2007 look at evaluation issues from the perspective of the customers or external users. In the first paper Setia, Calantone and Boyer examine the customer response to the service from four online home delivery grocery stores. The research was carried out using 2 years worth of data collected from a panel of 304 home users of these services. The results suggest that the customers appreciated the positive value of the system and that this was reflected in the reliability

of the business value created. The authors anticipate further research into the customer focussed evaluation techniques developed within this project.

The last paper is also perhaps the most traditional of conference ISE evaluation topics. Swaid and Wigand take us back to the issue of measuring web-based service quality. Swaid and Wigand take Parasuraman et al's (1988) service quality model for the traditional retail industry (SERVQUAL) and adapt it for use in an online retail context. This uses a customer centric approach that contrasts with previous approaches based on the perceptions of web-developers and designers. Using data collected through an online questionnaire the authors demonstrate the validity of this new measurement instrument and report some interesting conclusions about factors influencing the customers' perception of service quality and their loyalty intentions.

Three challenges for IS evaluation research

Presenting an introduction to the mini track gives us (the chairs) the opportunity to do some public crystal ball gazing. It is also an opportunity to engage in debate with those of you who have so generously supported us by submitting papers, reviewing and by attending the sessions. It is in that spirit that the following ideas are offered to the debate.

Both of the trends – portfolio management and ILM (discussed above) – show how ICT is becoming more pervasive and central to the success of an organisation. As ICT becomes more and more embedded within the organisation so the survival and growth of the organisation becomes more dependant on the health of its ICT infrastructure. Poor financing and financial management has long been recognised as a key indicator of corporate health and many jurisdictions require public filling of audited accounts. A balance sheet is a codified common model of corporate financial health open to scrutiny and audit. Quite complex codes of practice define its creation and use. We can imagine a future where stakeholders will want to see similar assurances about the IS health of an organisation. A challenge for the IS evaluation community is to devise such an approach in somewhat less time than it took the accountants.

Integration is the other plank in our research group ISEing and it poses the second challenge. It earned its place in the title of the group at a very early stage in its evolution because the evaluation of system integration projects and strategies presented specific problems. This area too is evolving away from a focus on the technical considerations. Internal systems integration takes place under a common corporate umbrella with an (allegedly) common corporate mission. Led by supply chain integration we are seeing increasing numbers of projects integrating systems between corporate bodies. Some of these are quite disparate.

Consider, for example, a discussion from the UK Smart Card Networking Forum². There are about 30 local government councils in the London area. Several of them have or are developing smart card identity systems and an organisation called London Connects manages the interchange of information and common identity standards between the councils. Separately there is an organisation – Transport for London (TfL) – that runs a citywide smart card system for rail or bus tickets and charging. Note London is too big for the flat fare systems that many cities operate and there are several different rail and bus operating companies providing transport services. The TfL system (Oyster) guarantees to charge the minimum fare for whatever combination of journeys a person makes over a single day. What if a citizen could carry a single Oyster Card that served as travel ticket, access to libraries and other public facilities, and identification for things like public elections or benefits claims?

There are obvious benefits for such federated infrastructure schemes and the organisations involved are giving them serious consideration. However, there are also pitfalls like managing the loss and issue of cards; identity theft and the intrusion of privacy by linking of data that has no valid reason to be seen together. Another difficulty is the governance and day-to-day management of the shared infrastructure. Who is responsible for planning? Who is responsible when it goes wrong? This infrastructure lacks the coherent purpose of internal integration and is more diverse in its objectives than a supply chain system. The challenge is how to evaluate such a proposal and how to monitor and evaluate the system in operation.

² Smart Councils Sharing Smart Ideas: Forum Meeting, 12 October 2006, Sheffield, UK

Our motivations are complex and most people in developed countries, like the United States, fall around the middle of Maslow's triangle or hierarchy of needs (1943). This model, and others like it (Huitt, 2004), shows us that once the concerns that represent immediate survival and safety are met we are motivated by issues like social belonging, esteem and eventually a desire for understanding and aesthetics. In other words security and affluence will create a trend for us to have a wider interest in the outcomes of our activities than their direct impact on a revenue stream.

The VIEGO results exemplify the notion that, in a developed society, stakeholders will want systems to have social value, or meet ethical (green) principles, or even just be pleasing to use. The third challenge for evaluation methodology is to respond and satisfy the aspirations of stakeholders with a wider agenda. At one level it could be argued that all these factors simply influence the market and all that matters is how they will eventually translate into revenue. However, evaluating or predicting how our systems measure up against these 'non-cost' scales is a necessary prerequisite to making the appropriate revenue creating decisions.

Acknowledgement

The continued work of the Information Systems Evaluation and Integration Group (ISEing) at Brunel University (and our work as mini-track chairs) is partly funded by the UK's Engineering and Physical Sciences Research Council (EPSRC). We are indebted to them for their continued support of research projects in this area (eGISE grant GR/T27020/01 and VIEGO grant EP/D043840/1).

References

- Anon (2007) e-Innovations Evaluation report, URL: <http://www.exploringinnovation.org.uk/e-innovations-evaluation-report>, Accessed 30/4/2007.
- Audit Commission (2002) Council services compendium for England: Performance indicators 2002/03, Audit Commission Publications, Wetherby, UK, Available from: <http://www.audit-commission.gov.uk/Products/PERFORMANCE-INFORMATION-DOCUMENT/419D6A5F-56A2-4B84-BF93-A92A8D8FB7C2/PerformanceIndicators2002-03compendium.pdf>, Accessed 8/5/2007
- Brynjolfsson, E., and Hitt, L (1998). "Beyond the productivity paradox," Communications of the ACM, **41**(8), 49-55.
- DCLG: Department of Communities and Local Government. (2006). The e-Innovations Programme: Programme Summary. URL: <http://www.communities.gov.uk/index.asp?id=1505672>, Accessed 12/4/2007.
- Drucker PF. (1959) Landmarks of tomorrow. Harper, New York,
- Elliman, T, and Hayman A, (1999) A Comment on Kidd's Characterisation of Knowledge Workers. Cognition. Technology and Work **1**(3): 162-168.
- Huitt, W. (2004). Maslow's hierarchy of needs. Educational Psychology Interactive. Valdosta, GA: Valdosta State University. URL: <http://chiron.valdosta.edu/whuitt/col/regsys/maslow.html>, Accessed 8/5/2007.
- Irani, Z. and Elliman, T. (2007) Electronic Transformation of Government in the UK: A Research Agenda, A Project VIEGO Report, ISBN 978-1-902316-53-6, London, Brunel University, Available from: http://www.iseing.org/iseing/Resources/VIEGO_Report.pdf, Accessed 30/4/2007.
- Maslow A. H. (1943) A Theory of Human Motivation, Psychological Review, **50**, 370-396, Available from: <http://psychclassics.yorku.ca/Maslow/motivation.htm>, Accessed 8/5/2007.
- Parasuraman, A., Zeithaml, V. and Berry, L. (1988). SERVQUAL: A multi-item scale for measuring consumer perception of service quality. Journal of Retailing, **64**, 2-40.
- POST: Parliamentary Office of Science and Technology (2003) *Government IT projects*, Report 200, London, July 2003 Available from: <http://www.parliament.uk/post/pn200.pdf>, Accessed 8/5/2007.