

2000

# Investment Evaluation of New Technology: Integrating IT/IS Cost Management into Model

Zahir Irani

*Brunel University*, [zahir.irani@brunel.ac.uk](mailto:zahir.irani@brunel.ac.uk)

Peter Love

*Deakin University*, [pedlove@deakin.edu.au](mailto:pedlove@deakin.edu.au)

Michael T. Hides

*Brunel University*, [mick.hides@bigfoot.com](mailto:mick.hides@bigfoot.com)

Follow this and additional works at: <http://aisel.aisnet.org/amcis2000>

---

## Recommended Citation

Irani, Zahir; Love, Peter; and Hides, Michael T., "Investment Evaluation of New Technology: Integrating IT/IS Cost Management into Model" (2000). *AMCIS 2000 Proceedings*. 230.

<http://aisel.aisnet.org/amcis2000/230>

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 2000 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# Investment Evaluation of New Technology: Integrating IT/IS Cost Management into Model

Zahir Irani, Department of Information Systems and Computing, Brunel University,  
Zahir.Irani@brunel.ac.uk

Peter E.D. Love, School of Architecture and Building, Deakin University  
Pedlove@deakin.edu.au

Michael T. Hides, Department of Information Systems and Computing, Brunel University,  
mick.hides@bigfoot.com

## Abstract

The inability of managers to determine the true costs of deploying Information Technology (IT)/Information System are considered attributable to a lack of knowledge and understanding of what constitutes an IT/IS related cost. In developing a deeper understanding of such costs and their respective taxonomies, the presented work in progress offers a conceptual model that is underpinned by a hypothesis. As a result, the proposed model can be used to support those firms seeking a rigorous cost evaluation.

## Introduction

If firms are to harness the full potential of IT/IS then they must identify and evaluate the significance and impact of their direct and indirect costs. A motivation for this is that investments in IT/IS are increasingly complex and involve many stakeholders internal and external to an organisation. As such, deploying IT/IS is no longer a trivial matter limited to direct costs alone but instead, forms a considerable part of a firms' capital expenditure and comprises of a wide variety of indirect human and organisational costs. In supporting investment decision makers, during the IT/IS evaluation process, this paper presents a conceptual model that is underpinning a research proposition, as part of on-going research to develop a robust holistic evaluation model.

## Cost Management of IT/IS

It is considered widespread practice during the investment decision making process to account for the upper estimates for costs and the lower estimates for benefits (Hogbin and Thomas, 1994). However, this heuristic appears *not* to be solving the problem of IT/IS projects running over budget, as much of the problem lies in management *not* fully understanding cost portfolios. Such claims are substantiated with empirical evidence presented by Ezingard et al., (1999) and Irani (1998).

## Direct Costs

Direct costs are those that can be attributed to the implementation and operation of IT, which are typically the focus of senior managers. Although, these costs often go beyond the initial user specification of the information system.

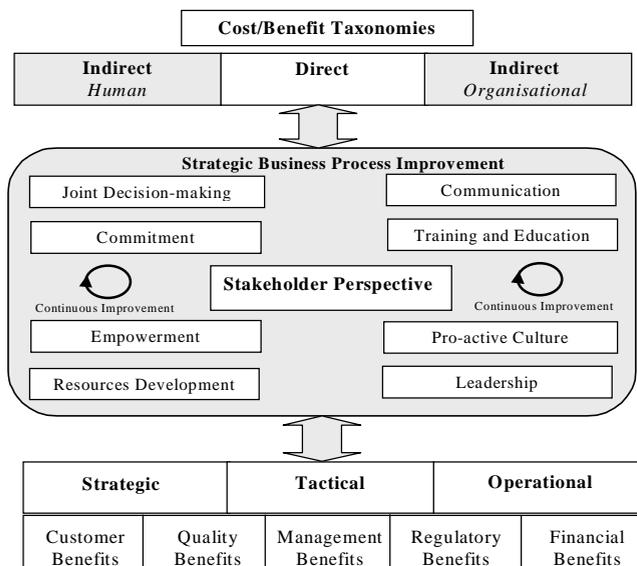
## Indirect Costs

As hardware costs continue to fall in price, Wheatley (1997) predicts that IT-related human and organisational costs are set to rise. Strassmann (1992) concluded that at the US Department of Defence, for every \$1 spent on IT and associated equipment, a further \$7 needed to be spent on softer human and organisational issues. Hochstrasser (1992) suggests that human and organisational costs are rarely budgeted for in IT/IS investment proposals, which may partially explain the phenomenon of cost-creep. As a result, indirect costs can therefore be categorised as human and organisational factors (Hochstrasser, 1992; Irani et al., 1997).

## Integrating IT/IS Cost Management into Conceptual Model

The model presented in Figure 1 has been derived from the literature, practitioners' insights, and the authors' experiences. The authors' particular interests' centre on the importance of human and organisational cost issues, with Love et al., (2000) focusing on the broader social constructs and *other* taxonomies of the model.

Figure 1 Conceptual Model For Investment Evaluation of New Technology



### IT/IS Cost Portfolios Embedded in the Proposed Conceptual Model

Price Waterhouse (1991) suggests an interesting reason why a rigorous cost analysis process is essential for proactive management. It is argued that in a recessionary climate, a concern for cost savings and quick returns might be sought, through applying IT/IS for the purpose of cost cutting. However, this could pressurise proponents of the project into neglecting a rigorous cost analysis, in way for the perceived need to adopt IT/IS for the purpose of reducing organisational costs.

Ironically, without a rigorous costing process, IT/IS may actually add substantial cost to the organisation before any savings are made, or that the total cost of the project may even exceed the expected benefits sought. Hence, justifying the need for a rigorous cost analysis process, and for taxonomies of cost factors. The need for a holistic analysis of cost implications is exemplified by Farbey et al., (1993), who report the detrimental consequences of project champions; project leaders who are totally committed towards the success of an investment, and who often ignore the full cost implications of their investments. This is further complicated through including optimistic estimates of benefits and savings within the projects' proposal. The failure of a project leader to identify the full cost implications of IT/IS investments such as MRPII (Manufacturing Resource Planning) or ERP (Enterprise Resource Planning), which typically have high running costs, can seriously limit the success of the project. Indeed, there are significant indirect costs (human and organisation) that need acknowledging during the justification process (Irani, 1998). Furthermore, neglecting the holistic (direct

and indirect) costs associated with IT/IS, when combined with over optimistic estimates of benefits and savings, may result in several years of extra use, to achieve expected financial returns. As a result, rendering the use of outdated technology to recover earlier investments and thus, having a possible affect on organisational competitiveness. Clearly, the acknowledgement of as many project cost implications as possible, will help present a much more realistic 'picture' of the projects' viability, and increase it's manageability. Hence, based on the above presentation of cost portfolios: direct and indirect costs, the following research proposition is proffered:

*An IT/IS evaluation model that incorporates taxonomies for determining direct and indirect [human and organisational] costs can significantly improve the effectiveness of the investment decision making process.*

This proposition suggests that the costs associated with IT/IS can and should be classified as direct and indirect: human and organisational costs. As such, integrating costs taxonomies into the decision making and evaluation process.

### Concluding Comments

The importance of establishing taxonomies that take into consideration human and organisational aspects is a significant departure from the conventional approaches used to evaluate technological systems. By taking a stakeholder perspective it is suggested that the process of investment and implementation of IT should be driven by the organisations capability, the level of competency available and the inherent culture, values and level of experience that is available. When considering IS investment it is no longer appropriate to include only conventional, economically based costs as the justification process needs to focus on variety of benefits at the strategic, tactical and operational level. The proposed conceptual model will guide the authors in developing a robust holistic evaluation model that will improve the effectiveness of the IT/IS justification process.

### Acknowledgements

The authors also would like to acknowledge the financial support provided by the Australian Research Council and the Engineering and Physical Sciences Research Council (EPSRC), UK Grant ref: [GR/M95066].

### References

Ezingear, J-N., Irani, Z. and Race, P. "Assessing the value and cost implications of manufacturing information and data systems: An empirical study," *European Journal of Information Systems* (7:4), 1999, pp. 252-260.

Farbey, B., Land, F. and Targett, D. *IT Investment: A Study of Methods and Practices*. Published with Management Today and Butterworth-Heinemann, UK, 1993.

Hochstrasser, B. "Justifying IT investments," Conference Proceedings: *AIS; The New Technologies in Today's Business Environment*, 1992, pp. 17-28.

Hogbin, G. and Thomas, D.V. *Investing in Information Technology: Managing the Decision-making Process*. McGraw-Hill/IBM Series, Cambridge, UK, 1994.

Irani, Z. *Investment Justification of Information Systems: A focus on the evaluation of MRPII*. Ph.D., Brunel University, Dept of Manufacturing and Engineering Systems, GB, 1998.

Irani, Z., Ezingear, J-N. and Grieve, R.J. "Integrating the Costs of an IT/IS Infrastructure into the Investment Decision-making Process," *The International Journal of Technological Innovation, Entrepreneurship and Technology Management (Technovation)*, (17:11/12), 1997, pp.695-706.

Love, P.E.D., Irani, Z., Li, H. and Cheng, E.W.L., "A Model for Assessing the Organisational Costs of IT/IS in Construction Organisations," *Construction Information Technology Conference*, Icelandic Building Research Institute in affiliation with CIB Working Commission W78, IABSE and EG-SEA-AI, June 28th - 30th, Reykjavik, Iceland, 2000.

Price Waterhouse 'Information Technology Review'. Price Waterhouse, London Bridge, UK, 1991.

Strassmann, P. "The Politics of Downsizing," *Datamation*, 15<sup>th</sup> October, 1992, pp.106-110.

Wheatley, M. "Hidden Costs of the Humble PC," *Management Today*, January, 1997, pp. 52-54.