IT Evaluation Methods: Drivers and Consequences

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Abstract

The evaluation of information technology (IT) is a fundamental for the organisation. This paper discusses factors limiting the use of IT evaluation methods in industry. Drawing on literature review, three hypotheses are presented to shed further light on the subject. They attribute budget limitations, the functionality of the IT system, and way an organisation decides on IT investments. Budget limitations are attributed to limit the decision makers ability to put the cost of the IT evaluation project ahead of the need to properly evaluate the project. Functionality of the IT system within the organisation can limit the use of specific evaluation methods if the system is heavily integrated within different departments. Finally, the ability of IT evaluation to influence the investment decision is discussed, as well as the effect of not using certain evaluation methods. This paper also suggests a plan for further research in this subject.

Introduction

A specific trend has been identified in the use of IT evaluation methods in industry during the last decade (Ballantine and Stray, 1998; Computer Finance, 1997; Deitz, 1994). In the early days, it was suggested that managers were conducting IT investment decisions on the basis of gut feeling or act of faith (Farbey et al., 1993). In later years, simple quantitative IT evaluation methods, such as NPV and Payback, were reported to be in use over other methods (Ballantine and Stray, 1998; Computer Finance, 1997; Deitz, 1994). Bannister (1998) concluded that the increase in spending on IT systems indicates the importance of IT evaluation, even though organisations are second guessing the evaluation method used. Although these are relatively simple measurement techniques, traditional evaluation methods tend to exclude what might be termed softer project variables such as political influence, culture and attitude, which might otherwise alter the trade-off equation (Griffiths, 1994; Pennington and Wheeler, 1998). Furthermore, such methods are not capable of dealing with modern strategic uses of the IT system (Kaye et al., 1995).

Clearly, this raises the issue of ensuring that the appropriate evaluation method is chosen when evaluating an IT system. This is made all the more important given the possible results of poor IT evaluation: underestimation of costs, loss of benefits, and partial or complete project failure. Therefore, identifying the main factors and consequences contributing to successful project evaluation is an ongoing issue in the IT arena. This paper discusses potential factors that might be seen to restrict the use of IT evaluation methods and points to the potential consequences of the practices involved.

This paper discusses the use of evaluation methods in industry today, and explores the reasons as to why so little is spent on the vital area of IT evaluation. In order to look more closely at IT evaluation it is necessary to look at the context of the organisation as a whole, rather than merely at IT-department level as this further complicates evaluation. Decisions made by organisations at a strategic level are in part determined by the results of any such evaluation of their IT investment and, with the focus today on justification for IT spending, it is timely to look at this area more closely. The paper proposes three hypotheses, and these will further be discussed as they form the motivation for the initial research agenda outlined in the conclusions.

Limited Use of IT Evaluation Methods

Research shows that spending in IT departments has generally increased over the last few years (Price Waterhouse, 1996). IDC research estimates an increase between 1995 and 1997 in the IT global market from $530 billion to $1.8 trillion (Willcocks and Lester, 1999). IDC also forecasts a 10% global increase in growth between 1996 and 2000. Such figures illustrate the increased pressures on decision makers to better justify their IT project expenditure. These pressures are attributed in part to increasing limitations on organisational resources as a result of competition among different departments for investment capital, including the IT department (Remenyi, 1995).
Furthermore, research shows that very few post-implementation evaluations actually take place in industry (Remenyi and Sherwood-Smith, 1999), indicating the unavailability of organisational resources to carry out the proper evaluation (Farbey et al., 1993). As noted above, the use of traditional evaluation methods would run the risk of not identifying all the hidden costs and softer benefits, and not allow the system to reach its full potential. But the relationship between the evaluation costs and its influence on the selection of the evaluation method is still under question. In 1996, a worldwide IT productivity survey of over one hundred companies conducted by Rubin Systems showed budget increase for the IT department was only 3% even though demand for IT systems was 25% (Computer Finance, 1998). Furthermore, System House (1999) attributes most of the increase in IT budget over the last three years to the Y2K problem. Increases in the IT budget may not therefore completely reflect an increase in the capability of the IT department to perform better (more costly) evaluations. This assumption links the budgetary limitations on the IT department with the limited use of the evaluation methods in practice. Hence, it is reasonable to propose the following hypothesis, namely that organisations spend a small proportion of the IS budget on IT evaluation.

This hypothesis suggests a relationship between the type of IT evaluation method selected and the cash cost of conducting such project. It assumes that the overriding factor in choosing the IT evaluation method is not its ability to properly carry out the task required but its cost, and how that cost factors into the total budget for the IT department. It looks at the financial limitations of the IT department and suggests that the IT evaluation project has to compete with other projects for acceptance in terms of value for money. Therefore, the hypothesis aims to investigate if budget limitations compromise the IT evaluation project. Further research into the functionality of the IT system may provide a different explanation as to the limited use evaluation methods. Smithson and Hirschheim (1998) claim that:

‘information systems have become (i) much more sophisticated, multi-functional, physically interlocked, and with a wider scope (ii) more towards being a communication and information infrastructure than supporting an individual business group (iii) in some cases, part of the product of service (e.g., ATMs and airline seat reservation system) (iv) strategic in usage which will make it difficult to evaluate.’

Technology involved in acquiring, storing, processing, and distributing information present a set of complicating issues (Smithson and Hirschheim, 1998). That complexity stems from the number of alternatives available to the IT design and implementation process, the level of required criteria (Beach, 1990).

Therefore, complexity associated with the IT system may influence the evaluation project. A closer look at the functions of the IT department will better clarify this issue of functionality and use of evaluation methods. According to a report published by Bloor Research (1998), there is no general consensus on the position of the IT department within the organisation. This is for the most part due to the fact that it is multi-tasked, and thus operating as a service provider and maintainer of the IT system, a modifier and engineer of current IT needs, and as a strategic planner for future needs. The same report suggests that the structure of the IT department may arise because of political factors, historical reasons, or even for coincidental reasons. Furthermore, the department may report to the financial manager, general management, or have its own representative on the board of directors. Therefore, the IT department may have a number of different structures. Bloor Research (1998) also suggests that most large IT departments have the structure as shown in figure 1.

Figure 1: The IT Department

First, management of the day-to-day systems that serve the other departments, and running the user helpdesk is the responsibility of the Production staff. Change staff are accountable for all functions involved in bringing applications into production. They also act as the intelligence system of the organisation. Finally, the assessment and planning for the adaptation of new IT systems is the responsibility of the Strategy staff. All the sub-departments within the IT department have highly integrated functions within the organisation. That is to say, output of the strategy staff is used by the change staff, and that of the change staff is used by the production staff.
Therefore, sharing costs, benefits, and disbenefits is a common practice among departments of the organisation (Smithson and Hirschheim, 1998). This level of sharing depends on the type of IT system in place. For example, strategic and business transformation systems are extremely well-integrated within the operation of the organisation, and interorganisational systems are shared by two or more organisations (Farbey, et al., 1993). This therefore leads to the following hypothesis, namely, that the more IT integrates within the organisational business processes, the harder it will be to evaluate it, both ex-ante and ex-post.

This hypothesis suggests a relationship between the functionality of the IT system and the method used to evaluate it. It assumes that the overriding factor in selecting the IT evaluation method is the degree to which organisational, departmental, or employee boundaries can be drawn to attributed costs, benefits, and disbenefits to their original generator. Here, the ability of the IT evaluation project to produce the required results is limited to methods that can account for all costs and benefits. That ability is associated with the level of IT integration within the organisation. Therefore, this hypothesis looks at the links that exist between the exclusion of certain evaluation methods as a result of the organisational use of IT system. The consequences of the limited use of IT evaluation is also a subject of much debate (Bannister, 1998; Irani et. al., 1999). Research shows that defects in the collection and utilisation of knowledge from the evaluation project will ultimately lead to the adaptation of an unsuitable strategy, resulting in the investment in an unsuitable system (Beach, 1990).

Small and Chen (1995) suggest that organisations typically have one of three investment strategies after the IT evaluation is completed, especially in the case when not enough information was collected to justify the business case. These are:

(i) decline to undertake IT projects that could be beneficial to the long-term competitiveness of the organisation;

(ii) invest in projects as an act of faith; or

(iii) use creative accounting to pass the budgetary process. Therefore, the limited use of evaluation might cause the organisation to adopt a certain investment strategy. Hence, the following hypothesis is generated, namely that the way an organisation justifies its investment in IT affects the strategy adopted.

This final hypothesis further strengthens the relationship between IT investment criteria and the results of the evaluation project.

It assumes that the overriding factor in selecting IT investment strategy is the information available for the organisation to make that decision. Consequently, if the IT evaluation method used does not produce the required information, the organisation will not be able to make a proper decision. Here, selecting the suitable evaluation method is directly linked with the IT investment decision making process.

Conclusions

There is evidence to support the view that IT evaluation is affected by budgetary limitations. Increased spending on IT systems has added pressure on IT investments to compete with other potential projects. Therefore, cost-cutting from IT proposals will give the project a more favourable probability of acceptance. Cost-cutting from the IT proposal includes cutting from the IT evaluation project. Therefore, certain evaluation methods are excluded, which compromises the entire IT system.

There is also evidence to support the view that IT evaluation is affected by the functionality of the system. The degree of system integration within the business processes will affect the evaluator's ability to attribute costs, benefits, and disbenefits to their original generators. As a result, certain IT evaluation methods are excluded, which negatively reflects on the organisational performance.

The way an organisation decides on IT investments has also been linked with the method used. The capability of the organisation to make a decision depends on the information available to them about that decision. Therefore, if an inappropriate evaluation method was used, the organisation would be at a disadvantage in making that decision.

Three hypotheses have been presented here, namely, that organisations spend a small proportion of the IS budget on IT evaluation, that the more IT integrates within the organisational business processes, the harder it will be to evaluate it, and finally that the way an organisation justifies its investment in IT affects the strategy adopted.

More in-depth studies are, naturally, required to further support the arguments as empirical data is needed to back them up. Performing multiple case studies can provide such data, and indeed this is on the research agenda. In order to find answers to support or disprove these hypotheses, it has been considered necessary to rule out organisations that do not have extensive experience in running an IT departments, so organisations with established IT departments have been identified as prime candidates. Next, an interview agenda will be developed, the purpose of which is to make initial investigations into the spending patterns of the IT department, the decision-making process within the department and the organisation more generally, and the functionality of the IT system.
The results of this research and subsequent analysis will shed further light on the hypotheses.

References


