

A Systemic Approach for Information Systems Evaluation

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INTRODUCTION

Traditionally, information technology (IT) evaluation, pre-implementation appraisals, and post-implementation reviews have been characterised as economical, tangible, and hard in nature. The literature review on IT evaluation shows a great bias towards using economical and tangible measures that represent the management's view of what is 'good' and 'bad', which had been described as narrow in scope and limited in use. Smithson and Hirschheim (1998) explain that "there has been an increasing concern that narrow cost benefit studies are too limited and there is a need to develop a wider view of the impact of a new system." Ezingear (1998) emphasises the importance of looking at the impact of IS on both the overall system and the whole organisation.

The concern of IT evaluation is to measure whether the IT solution meets its technical objectives and to what extent. In such activity, instrumentation is highly appreciated and particularly chosen. Product oriented, instrument led, and unitary are the main characteristics of such a perception. Mainly evaluation was seen as a by-product of the decision-making process of information systems development and installation. Most of the evaluation tools and techniques used were economic based, geared to identifying possible alternatives, weighing the benefits against the costs, and then choosing the most appropriate alternative. St. Leger, Schnieden, and Walsworth-Bell (1992) explain that evaluation is "the critical assessment, on as objective a basis as possible, of the degree to which entire services or their component parts fulfil stated goals." Rossi and Freeman (1982) advocate that "evaluation research is the systematic application of the practice of social research procedures in assessing the conceptualisation and design, implementation, and utility of social intervention programs."

Post-implementation evaluation has been described by Ahituv, Even-Tsur, and Sadan (1986) as "probably the most neglected activity along the system life cycle." Avison and Horton (1993) report that "evaluation during the development of an information system, as an integral part of the information systems development process, is even more infrequently practised." In acknowledging all

of the above concerns about the evaluation of IT interventions, the author presents in this article a measures identification method that aims at identifying those measures or indicators of performance that are relevant to all the stakeholders involved in such interventions.

POST IMPLEMENTATION REVIEW

Many researchers concerned with IT evaluation, mainly post-implementation reviews, have identified an urgent need to migrate from this 'traditional' and economical view towards using a mixed approach to IT evaluation. Such an approach will allow IT evaluators to mix between 'hard' and 'soft' measures, as well as economical and non-economical measures (Chan, 1998; Ezingear, 1998; Bannister, 1998; Smithson & Hirschheim, 1998; Avison & Horton, 1993). Furthermore, there is a need to shift towards utilising an approach that reflects the concerns of all involved stakeholders rather than a Unitarian approach (Smithson & Hirschheim, 1998). Any systemic approach to IS evaluation must take into account two main issues regarding the collective nature of IS: choosing the relevant measures of performance, and equal account for economical as well as non-economical measures.

Choosing the Relevant Measures of Performance

Abu-Samaha and Wood (1999b) show that:

"the main methodological problem in evaluating any project is to choose the right indicators for the measurement of success, or lack of it. These indicators will obviously be linked to aims but will also be relevant to the objectives chosen to achieve these aims, since if the wrong objectives have been chosen for the achievement of an aim, then failure can be as much due to inappropriate objectives as to the wrong implementation of the right objectives."

Willcocks (1992), in a study of 50 organisations, gives 10 basic reasons for failure in evaluation practice; amongst

these reasons are inappropriate measures and neglecting intangible benefits. Ezingeard (1998) shows that "...it is difficult to decide what performance measures should be used." On the other hand, a different set of indicators or measures of performance will be chosen at each level or layer of the IT intervention (product, project, and programme), which adds more to the relevance of the chosen measures.

Another important aspect of choosing indicators or measures of performance is to choose the relevant measures that add value to a particular person or group of persons. Smithson and Hirschheim (1998) explain:

"There are different stakeholders likely to have different views about what should be the outcome of IS, and how well these outcomes are met. Who the different stakeholders are similarly need[s] to be identified."

The measures identification method proposed by the author in this article provides such relevance through the identification of stakeholders and the subsequent 'human activity system' analysis. This is done by exploring the particular worldview, which is unique for each stakeholder, and the identification of the relevant criteria for *efficacy*, *efficiency*, and *effectiveness* of each stated transformation process. Such investigation would allow for the identification of the most relevant measures or indicators of performance for the stated stakeholder(s).

Equal Account for Economical as well as Non-Economical Measures

Post-implementation reviews have had a tendency to concentrate on 'hard', 'economical', and 'tangible' measures. Chan (1998) explains the importance of bridging the gap between 'hard' and 'soft' measures in IT evaluation, realising that "this in turn requires the examination of a variety of qualitative and quantitative measures, and the use of individual, group, process, and organisation-level measures." Avison and Horton (1993) warn against confining post-implementation reviews to monitoring cost and performance and feasibility studies on cost-justification, saying that "concentration on the economic and technical aspects of a system may cause organisational and social factors to be overlooked, yet these can have a significant impact on the effectiveness of the system." Fitzgerald (1993) suggests that a new approach to IS evaluation, which addresses both efficiency and effectiveness criteria, is required.

The approach described in this article gives an equal account to tangible as well as intangible benefits of IT intervention by identifying efficacy and effectiveness measures along with efficiency measures. The measures

identification method proposed by the author provides a better understanding of the context of evaluation which would give a better account of the content of evaluation.

SOFT EVALUATION

The approach advocated here brings together formal work in evaluation (Patton, 1986; Rossi & Freeman, 1982) with a qualitative process of investigation based on Soft Systems Methodology (Checkland & Scholes, 1990) in order to allow us to make judgements about the outcomes of an implementation from a number of different viewpoints or perspectives. The performance measures identification method proposed in this article operates through three stages.

Stage One: Stakeholder Analysis

The first stage of the proposed method is to identify the intra- and inter-organisational stakeholders involved in the intervention. A stakeholder, as defined by Mitroff and Linstone (1993), is any "individual, group, organisation, or institution that can affect as well as be affected by an individual's, group's, organisation's, or institution's policy or policies." Mitroff and Linstone (1993) explain that an "organisation is not a physical 'thing' per se, but a series of social and institutional relationships between a wide series of parties. As these relationships change over time, the organisation itself changes." Mitroff and Linstone's view of an organisation is synonymous to Checkland and Howell's (1997), which negates the 'hard goal seeking machine' organisation.

Stakeholder analysis can be seen as a useful tool to shed some light on the subjective process of identifying relevant measures of performance for evaluation. A number of questions can be asked at this stage such as where to start, who to include, and who to leave out. The value of the investigation will be of greater importance if all relevant stakeholders are identified and included in the evaluation effort. It is obvious at this stage that some stakeholders will be of greater importance than others because of the power base that they operate from, and such stakeholders are to be acknowledged. At the same time, however, other relevant stakeholders should not be undermined for lack of such power.

While Mitroff and Linstone (1993) do not describe the process through which stakeholders may be identified, they recommend the use of a *stakeholder map*, as shown in Figure 1. They explain that "a double line of influence extends from each stakeholder to the organisation's policy or policies and back again—an organisation is the entire set of relationships it has with itself and its stakeholders." On

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