Evaluating Information Technology Projects in Finland: Procedures, Follow-Through, Decision-Making and Perceived Evaluation Quality

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Here we investigate the evaluation of information technology (IT) projects to determine when firms evaluate IT and what the effects are on decisions made about the projects. We study evaluation over the IT project life cycle among a sample of the largest firms in Finland from a variety of industries. We also investigate the use of procedures that are explicitly designed to evaluate IT projects and whether such procedures are associated with evaluation follow-through over the life of the project, managerial decision making, and perceptions of evaluation quality. Firms in the sample seldom evaluate IT investments after the initial project proposal and when they do the evaluation seldom results in substantial system modifications or abandonment. Explicit IT evaluation methods are associated with higher levels of evaluation follow-through during development, with a greater likelihood that managers will make a decision to abandon a project, and with higher levels of some measures of perceived evaluation quality.

Evaluating new information technology (IT) in the firm is very important for senior managers because of the enormous and growing portion of capital resources devoted to IT (Bryan, 1990). Furthermore, in the 1990s IT investments have become strategically important for firms as critical components for daily operations, as the structural backbone of the firm, as the mechanism for product and service delivery, and as value adding components to products. Managers and researchers, however, have recognized that evaluating new IT in the firm poses problems (Bittlestone, 1989; Delone and McLean, 1992; Dos Santos and Peffers, 1993; Willcocks, 1994).

In order to manage the allocation of resources to IT, managers need to be able to value such investments on several dimensions. In addition to the effectiveness of system development and the expected functionality of the system, managers must consider the system effects on user satisfaction (McKeen, Guimaraes, and Wetherbe, 1994a), the interests of various stakeholders (McKeen, Guimaraes, and Wetherbe, 1994b), and the realization of expected system benefits in use (Parker and Benson, 1988; Peffers and Saarinen, 1993). In many cases, however, the information required is difficult to obtain because the benefits of the investments are hard to quantify. As a consequence, prior research suggests IT investments are not always evaluated in practice (Farbey, Land, and Target, 1992; Powell, 1992; Saarinen and Sääksjärvi, 1992; Ward, Taylor and Bond, 1996), and where evaluation is done, managers are concerned about its quality (Peffers and Saarinen, 1993). Research in the U.S., The Netherlands, and Finland suggests that this problem is not particular to any one country (Kumar, 1990; Peffers and Saarinen, 1993; Saarinen and Sääksjärvi, 1992; Saarinen and Wijnhoven, 1995). This is troubling because management theory and accepted good practice, e.g., (Kendall and Kendall, 1998), assume that IT projects will be formally evaluated. That is, it assumes that managers will evaluate proposed projects in order to formally decide whether they are worth doing, will evaluate ongoing
projects to observe whether they are within schedule and budget, and will evaluate completed projects to determine how well objectives were achieved. At current trends, the greater share of all capital investments may soon involve IT. Will managers commit resources to a good part of all capital investments without adequate evaluation?

In this paper, we investigate the evaluation of IT investments among a sample of the largest firms in Finland. We wish to understand more about when firms evaluate IT investments and the effect of this evaluation practice on decisions about IT development and on perceived evaluation quality. The Finnish business environment is an interesting one in which to study IT evaluation practices because Finnish managers consider themselves farsighted investors, although this self-appraisal has been called into question by empirical evidence (Keloharju and Puttonen, 1995).

In this study we find that not all firms formally evaluate new IT and among those that do, evaluation trails off severely as the system moves through its life cycle. The minority of firms with explicit IT evaluation procedures, that is, evaluation procedures that are designed specifically for IT projects, tend to evaluate systems through the life cycle more than other firms. Such firms are more likely to abandon IT projects as a result of evaluation. Managers in such firms perceive that evaluation quality is higher in such firms than in others in terms of evaluation precision.

In the next section, we present the research questions and a research model.

**Research Questions and Model**

It would seem to be clear, from the enormous level of IT investments, that the use of IT can confer great benefits to firms. Companies find it difficult, however, to determine when to use IT and what kind of systems to build. As others have noted, much progress has been made in learning how to build complex systems, but little has been accomplished in learning how to determine what systems to build (Clemons, 1991). In consequence, executives make decisions to manage increasingly large IS projects and budgets without being able to draw on IT evaluation processes that are well accepted in practice or firmly anchored in theory (Banker, Kauffman, and Morey, 1990). Furthermore, the increasingly competitive impact of information systems makes their evaluation even more difficult. Strategic information systems are very difficult to evaluate because the environment of present-day companies is characterized by turbulence and constant change and because strategic information systems are designed to make use of that change for the benefit of the firm (Clemons, 1991).

IT investments are particularly difficult to evaluate for a number of reasons, including:

- many of the most important benefits are intangible (Powell, 1992);
- benefits may require a long period to be realized (Saarinen and Wijnhoven, 1995);
- the purpose of systems may be seen differently by different people in the organization (Farbey et al., 1992, p. 110);
- investments evolve over time and overlap in purpose (Dos Santos, 1991);
- investments may result in irreversible commitments to specific technologies (Heikkilä 1995);
- many of the business and organizational risks are exogenous and uncontrollable (Clemons, Thatcher and Row, 1995); and
- the number of potential investment options is huge (Gurbaxani and Whang, 1991).

Keen competition among firms requires them to make many IT investments regardless of their ability to evaluate them adequately (Banker et al., 1990). Consequently, the evaluation of IT investments is very important for senior managers, even though they find it difficult to get the information required for doing it (Peffers and Saarinen, 1993). Evaluation using easily obtained accounting data alone is not enough because such “evaluation may be biased toward the most easily measured benefits...resulting in systematic over or under-investment in IT (Peffers and Saarinen, 1993).” Furthermore, if evaluation is to become part of an organizational learning process, where members of the organization learn how to use IT to improve products and processes and learn how to better evaluate IT (Saarinen & Wijnhoven, 1995), evaluation should be done at several points in the life cycle of the system, not just at the project proposal stage.

**Research question 1:** When do firms evaluate IT projects? IT investments can be evaluated at any of several points on the systems life cycle, including: (1) at the project proposal stage, (2) during development at project milestones, (3) when development problems occur, (4) at implementation, (5) periodically during ongoing system use, and (6) when problems develop in use. Although management theory asserts that evaluation should be done throughout the system life cycle (Lester and Willcocks, 1993), empirical studies have suggested that IT investments are not frequently evaluated (Farbey et al., 1992; Powell, 1992; Saarinen and Sääksjärvi, 1992; Ward et al., 1996). We wanted to investigate whether firms that do evaluate IT formally, follow-up initial evaluation through the system life cycle.

**Research question 2:** What effects do such evaluations have on management decisions about the projects? Are IT evaluations proforma events intended to justify predetermined decisions, as suggested by Clemons and Weber (1990), or do they influence subsequent managerial decisions about the investments. As Keil (1995) has pointed out, disastrous consequences may result from the failure to make effective decisions about the continuation of projects under development. What effects result when managers do evaluate IT investments?

If the evaluation of IT investments in the firm is important, yet problematic, as suggested by the literature, then it may be interesting to try to determine whether managerial practices may lead to differences in the quality of evaluation or differences in the effectiveness of decisionmaking about IT projects. Specifically, we wonder whether firms that had taken
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