Outcomes and Benefit Modeling for Information Systems Investment

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Abstract. This paper discusses the importance of modeling in the planning and management of an information system. The paper specifically addresses three different levels of modeling, referred to as macro, meso, and micro models, and discusses some issues involved in quantifying the variables for the micro model. The paper indicates how these different types of business models may be used in the information systems environment.

Key Words: business outcomes, business benefits, modeling, cost/benefit analysis, macro modeling, meso modeling, micro modeling, return on investment

We are merely reminding ourselves that human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectations, since the basis for making such calculations does not exist; and that it is our innate urge to activity which makes the wheels go round, our rational selves choosing between the alternatives as best we are able, calculating where we can, but often falling back on our motive on whim or sentiment on chance. (Keynes, 1953 [1936])

1. Introduction

This is a theoretical or speculative paper that discusses the importance of business modeling in the planning and management of an information system. The paper specifically addresses three different levels of business modeling, which are referred to as macro, meso, and micro models, and discusses some of the issues involved in quantifying the variables for the micro model.

The understanding of the outcome of an information system and the benefits associated with it is an essential element in the successful planning and management of any information system implementation (Remenyi and Sherwood-Smith, 1996; Remenyi, Sherwood-Smith, and White, 1997). When used correctly, a benefit model can deliver a rich picture of the benefit potential and the cost implications of a proposed information system. In addition, by changing the assumptions used in developing the model, the information systems planner or sponsor may obtain greater insight into the issues most critical to the success of the implementation. Models are used primarily for their explanatory power and to help understand the impact of changes in the assumptions that underpin the suggested project.
In most organizations, the information system sponsor requires a detailed understanding of how the outcome may be achieved and how the benefit stream produced as a result of an investment may be generated, as well as an appreciation of the costs of implementing the system. One of the most effective tools available to assist in this is business or financial modeling. Furthermore, the sponsor of an information systems project should be in a position to present the purpose of the project, and especially the benefits that will accrue for the organization as a result of the investment, to the investment authorizing group in a convincing way. To achieve this, it is helpful to produce a business model of the benefits so they are clearly understood by all the stakeholders.

This paper focuses on different types of business models and indicates how they may be used in the information systems environment.

2. Background

There is a relatively long tradition in business that capital expenditure needs to be formally justified in terms of the benefits it will help accrue to the organization. Therefore, when a new machine is to be acquired, a fleet of vehicles is to be purchased, or a new factory is to be built, a capital investment appraisal sometimes, if not frequently, is undertaken. Capital investment appraisal usually involves a statement of the initial investment cost, the ongoing costs, and the anticipated benefits, as well as the calculation of a number of suitable investment performance indicators or statistics.

It frequently is difficult to formally justify investments in information systems (Ward, Taylor, and Bond, 1996; Willcocks and Lester, 1994; Remenyi, 1999). This is because reliable estimates on information systems costs and benefits are not always available or easy to obtain. This, at least in part, is due to the complex nature of the impact of information systems on organizations, which frequently leads to a portfolio of tangible and intangible benefits.

3. What are models?

In general, a model may be described as a representation of an artifact, a construction, a system, or an event or sequence of events. The representation may be abstracted into symbols, equations and numbers, that is, mathematical expectations; it may consist of a picture or a drawing, or a fabricated likeness such as a model airplane; or it may be an expression of a situation or relationship in words. A complex model may contain several of these representations simultaneously. The purposes of modeling are many and various; they include developing a fuller understanding of the relationship between the inputs, the process and the outputs of the issue being studied, as well as calculating the likely results of a project. Models often are produced to facilitate decision making in the management process (Akkermans, 1995; Proctor, 1995; Corbitt, 1995) and to help in this respect with the what-if questions. The extent to which this is achieved often is regarded as a measure of a model’s success (Karlin, 1983). On the other hand, models sometimes are produced simply to see how a result may appear.