

# Assessing the Value of Information Systems Investments

**Charlene A. Dykman**

*University of St. Thomas, USA*

## INTRODUCTION

Accurate assessment of the potential or realized value and impact of an information systems investment is becoming increasingly important. While hardware and software are, to a large extent, becoming commoditized, the overall cost of information systems projects continues to increase. Labor and other organizational costs continue to escalate. The result is that IS professionals must begin to view their systems projects with a business perspective. Such a business perspective includes the application of various quantitative approaches to assessing the value of information systems.

## BACKGROUND

Strategies for success in an increasingly information and technology intensive business climate often include major investments in information systems, including hardware, software, networks, and personnel. Investments in information systems continue to rise in both percentage of operating budget and total dollars. And yet, significant early research showed no correlation between expenditures for information technology and any known measure of productivity (Brynjolfsson, 1993; Brynjolfsson & Hitt, 1996; Landauer, 1995; Strassman, 1990, 1997a; Weill, 1992). Although a major expenditure, most companies do not calculate the return on investment (ROI) of the information system investment like they do with other major expenditures. Nor is there much consideration of the social/subsystem cost and benefits of major information systems investments (Ryan, Harrison & Schkade, 2002). Why not?

In the technology and business climate of today, executives, in many cases, seem to have bought into the idea that they have no choice. We see small organizations making major investments in monolithic ERP systems such as SAP and PeopleSoft. Executives seem to have been convinced, by their IS staff, by the vendors, and by the media hype about leading edge technologies, that they must implement the latest fad or methodology in order to remain competitive. We seem to have forgotten that these types of investments are “business” and “or-

ganizational” decisions rather than simply “technology” decisions. There is clearly a need to use standard business practices in evaluating the potential costs and benefits of our investments in information systems and the associated technology (Davis, 2002; Talon & Gurbaxani, 2000).

Just as expenditures rise, many information systems projects are judged as failures. We hear repeatedly that information systems fail to deliver on the promises made and the expectations generated. These failures result in a costly mistake for the organization and the project manager. When projects fail, the dollars invested have been wasted and there is a clear impact on the bottom line of the organization. Additionally, several researchers have found that the intangible costs can also be very significant. This is known as the social subsystem cost and many researchers opine that these costs need to be more seriously considered (Ryan, Harrison & Schkade, 2002).

But what if the project is a success? The chairman of the board has just asked you how much of the investment has delivered quantifiable benefits, since your company has just spent eight months and millions of dollars implementing a new business application. Trying to justify expenditures is very common practice in business. It is relatively easy to quantify and justify expenditures for a piece of manufacturing equipment, additional personnel, or payroll processing systems. Trying to quantify and justify an integrated information system (IS) is not quite as easy. Many of the benefits realized from an IS are intangible and managers are not quick to recognize such benefits, just as they often undervalue such benefits. Some recent researchers have begun to show a payoff for IT investments (Brynjolfsson & Hitt, 1995; Dewan & Min, 1997; Hitt & Brynjolfsson, 1996; Stratopoulos & Dehning, 2000). However, it is not clear when and where these payoffs will be found. Many business executives balk at measuring the value and performance of something so intimidating, complex and, well, so technical. However, a bottom line focus is really required, especially in organizations that have a very public image to present.

The information systems arena is facing continued scrutiny, due to the escalating costs that seem to spiral out of control. Stakeholders cannot afford to ignore assessment of the value of information systems, given the

huge amount of expenditures invested in these systems. As the technology sector on Wall Street has come under increasing scrutiny, organizations have become extremely cost conscious. Some researchers urge that stock market impact must be evaluated, especially as these investments relate to e-commerce and/or outsourcing (Hayes, 2000; Subramani & Walden, 2001). Not only have IS expenditures skyrocketed over the past few years, but also internal corporate departments have become much more aware of the charges incurred through chargeback algorithms over which they have little control. This directly impacts the bottom line of the firm. If we are serious about being good stewards of the organization's resources, changing the approach to information technology investment decisions can decrease expenses and increase revenue opportunities.

## **ASSESSING THE BENEFITS OF AN INFORMATION SYSTEM INVESTMENT**

Determination of the benefits and quantification of their projected value to the organization is a multifaceted task that is still more art than science. In fact, Ryan et al. (2002) found that there is a tendency for executives to view the post-implementation benefits as being more important than the implementation costs. There is renewed interest in establishing formal processes for managing IT investments due to the history of large capital investments with poor track records for success and perceptions of low return in value to the organization (Kim & Sanders, 2002). The ultimate value of IT is how it impacts business processes in line with the strategy of the organization. A good business case for an investment will show the appropriate linkage to this strategy. There are a variety of methods used to assist in this valuation:

- **No justification:** This includes a summary of operating and capital costs for the project and ongoing use of the system. There is no benefits analysis. This is used, and rightly so, for "cost of doing business" projects. Unfortunately, the real problem surfaces when every information systems investment decision is lumped into the "cost of doing business" group. This is an easy way to avoid scrutiny of the real expected cost or payoff from this investment. Senior general management in the firm must limit projects that fall into this "loophole" in order to accurately assess the costs and benefits of their IT investments.
- **Total cost of ownership:** This method is often used by consulting firms and includes the summation of all costs (purchase, operation, maintenance, and

disposal of technology) to compare costs within a product line. Notice again that there is only a focus on costs, not on the organizational benefits to be derived from this investment.

- **Financial metrics:** These methods focus on costs and benefits in financial terms, including interest rate information and the time value of money. Several researchers have stressed the importance of accounting techniques in valuing IT investments (Dehning & Richardson, 2002). Several key financial indicators, also known as accounting performance measures, should be used in financial analysis. These include the net present value (NPV), return on investment (ROI) and the internal rate of return (IROR) calculations. Real option evaluation includes the notion of uncertainty and risk (Li & Johnson, 2002). The question that is asked with real option evaluation is whether making the investment today has enough net present value to make up for losing the option to delay the investment (Carlsson & Fuller, 2000). Microsoft's Rapid Economic Justification Model, through a five-step process of discernment, attempts to align IT investments with the success of the business by defining critical success factors, assigning probabilities to risks, and so forth. This approach is quite comprehensive, but hardly rapid.

While appealing, the big risk with financial metrics is "spurious exactitude". We tend to believe, because there is a number associated with something, that we are really able to measure the phenomenon quantitatively. While it is imperative that we take a hard dollar approach to these hard to define and difficult to quantify variables, we must not lose sight of the threat to the validity of these results. Just because we cannot do it perfectly, does not mean that we should not do it. The process of such evaluation has a value in and of itself, in requiring us to focus on the business, its goals and strategies and to break down the components of a project and discern the relationships between the project and the business goals.

- **Information economics:** This is a scoring method that addresses the value of the information that results from the use of the system. This is difficult to measure since information itself is an intangible. Additionally, information itself has no inherent value. Value can be derived only when information is applied to specific organizational processes. If we are, for example, trying to evaluate the benefit of governmental spending on major information systems to track terrorists, then we can easily see the value of the information that might be provided. This is often compounded by that fact that the

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