

A Framework for IT Investment

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Abstract. The IT services structure opens the possibility for a number of studies aimed at determining the value of IT investments. Previous studies have not had much success in establishing a link between IT investments and firm performance. Much of this may be due to the presence of risky IT projects that consume a large portion of the budgets. The use of IT services, however, could serve as good indicators of the extent of IT within an organization while searching for the value links thought to be present. Lastly, services can be aligned to the strategic intent of an organization as viewed by different stakeholders. In this fashion we can study the viewpoints of different groups in their pursuit of firm success. The contingencies that may be found could provide a good indicator of the differences between information professionals and general management.

Keywords: IT Portfolio Management, IT investments, strategic decision-making, IT-Investment Framework.

1. Introduction

As business environments become ever more competitive there is an increased emphasis on operational efficiency, improved product and service quality, and responsiveness. Many business organizations have sought to use information technology (IT) as a means with which to achieve these objectives. Indeed, organizations are making significant investments in IT, currently accounting for about 50% of annual capital investments (Kriebel 1989). Surprisingly, there are few systematic guidelines as to how to measure the effectiveness of IT investments. In the current competitive environment, the need for better management of all organizational resources, and specifically IT, given its scale and importance, requires the development of comprehensive measures of its contribution to firm performance.[3]

A number of studies of IT productivity and business value, defined as the contribution of IT to firm performance, have appeared (Cron and Sobol 1983; Turner 1985; Bender 1986; Loveman 1994; Strassman 1990; Harris and Katz 1991; Weill 1992; Brynjolfsson and Hitt 1993; Lichtenberg 1993; Markus and Soh 1993; Brynjolfsson and Hitt 1994). However, there is little consensus about the nature of IT business value -- or whether IT is capable of creating value. Many of the existing studies were conducted using only firm level output or end-product based measures of value. The singular focus on firm level output variables, while important, provides only limited understanding of how value is created using IT. Few studies analyze the impact of IT on intermediate business processes, which would generate considerable insight into the creation of business value of IT from a process perspective can be conducted. The importance and benefits of adopting process oriented perspectives of business value are well recognized within the academic literature (Crowston and Treacy 1986; Bakos 1987; Gordon 1989; Kauffman and Weill 1989; Wilson 1993) and its perceived significance by practitioners is indicated by the recent interest in process innovation and reengineering (Davenport 1993; Hammer and Champy 1993).

Our thesis is as follows. Firms derive business value from IT through its impacts on intermediate business processes. Such intermediate processes include the range of operational processes that comprise a

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firm's value chain and the management processes of information processing, control, coordination and communication. As IT continues to permeate and penetrate the organization, impacting an increasing number of processes at a deeper level, the potential business value of IT increases. This potential is further enhanced by redesigning business processes and by the associated modifications to organization structure. Such structural modifications result in new organizational forms that enhance the productivity and business value potential of IT. At the extreme, Beniger (1986) has suggested that contemporary IT is a substitute for organization itself.

This paper develops a process oriented conceptual framework of the business value of IT intended to enhance our understanding of the links between organizations and information technology, and the subsequent effects on firm performance. The benefits of such a process oriented perspective are as follows. First, a process focus should enhance the validity of the business value assessment, since the analysis is conducted at the same level that the technology is deployed . Second, the approach offers considerable insight into the processes by which value is created . Barua , Kriebel, and Mukhopadhyay (1995) state that "[s]tudies that attempt to relate IT expenditures directly to firm level output variables ignore the web of intermediate processes, where first order effects exist." Thus, an important benefit of process oriented studies is the ability to move beyond correlational evidence to explanation of the technological features, process characteristics, organizational settings, and competitive environments conducive to producing IT business value.[5]

2. What Is IT Investment?

Information technology (IT) is changing the competitive dynamics in the manufacturing industry. For example, manufacturers are using technology to improve their operational efficiency and use it to put pricing pressure on their competition; or significantly improve customer service and use it to steal market share from the competition; or identify new business opportunities before anyone else and use it to grow their topline .[12]

However, technology is a double-edged sword -- it is not just a source of competitive advantage, but it can also be a source of disruption for the competition. A recent study by the consulting firm McKinsey concluded that executives feel that companies are most vulnerable to three technology-enabled threats:

- a) shift in customer expectations to a better or differentiated offering
- b) significant changes in product and service delivery costs and
- c) the emergence of new products or services from competitors.

The only way to prevent being disrupted is to pursue the information technology agenda aggressively yourself. Such an approach will not only provide you the competitive advantage you need to grow, but it will also ensure you are not the one who gets disrupted. But given the vast opportunities in investing in IT, how do you decide where to invest first? In this article, I will describe a simple but proven framework to help make prioritized decisions.

As a first step, you can start with mapping your current business processes and their key operational metrics for each of the product lines/business units. Using this information and comparing it to industry best practices/metrics will give you a starting point for identifying the processes that need attention. Once a short list of such processes has been identified, the next step is to prioritize IT automation opportunities in these processes based on their potential business impact and the relative ease with which they can be realized.[14]

3. The Linkage between Information Technology, Process and Value

The business value of IT is a joint technology-organization phenomenon. Therefore meaningful investigation of this phenomenon requires theoretical perspectives of both technology and organizations, and their interaction. Few previous studies have employed an underlying theory of how IT use in organizations leads to business value, and indeed, we are still missing intuitive models of the interaction between IT and organization. This absence again suggests a need to move to the process level so that we might develop an understanding of this interaction. Consideration of IT's role at the process level in the context of IT business value will contribute to our understanding of the role and potential of IT to enhance organization process and

structure. Indeed, Clemons and Reddi (1993) suggest that such an approach, as a means of building explanatory theory, has merit over attempts to force a phenomenon into pre-existing theory. Such insights will also be a valuable contribution to the literature on organizational structuring and business process re-engineering.

We have seen, therefore, that the literature on the one hand contains studies of the relationship between IT and output measures of business value that do not include adequate consideration of processes. On the other hand, studies of IT and organization structure and process do not incorporate consideration of the business value of IT. In the remainder of this paper we develop an integrative framework of IT, business processes, and business value. In developing this framework against the background presented this far, we considered that in order to be able to identify and study the process impacts of IT on business value, this framework should incorporate:

- a typology of business processes;
- a typology of potential impacts of IT on those processes;
- a framework for analyzing the business value of IT created by its impacts on those processes.[10,11]

4. The IT-Investment Framework

For many years management teams have struggled to achieve both short-term profitability and long-term survival and growth through their IT investments. Usually, they have expected profitability from new business applications and have regarded IT infrastructure as something necessary for long-term survival and growth. Electronic business opportunities have changed perceptions. Infrastructure services such as integrated systems ,data accessibility and secure networks are now critical to shortterm profitability.5 And long-term growth and survival depend on developing business applications that test emerging business opportunities.[4]



Fig. 1: A Framework for IT Investment

Analyzing the practices of companies in our study, we found that investments differ along two dimensions: strategic objectives, necessary IT capability. Transformation investments are necessary when an organization’s core infrastructure limits its ability to develop applications critical to long-term success. (See“Characterizing IT Investments.”) Transformation is triggered by the growing need for integrated customer data, end-to-end processing and platforms that provide around-the-clock support. Transformation initiatives are often risky, undertaken when companies have determined that not rebuilding infrastructure significantly is even riskier. Enterprises whose outdated IT infrastructures have pushed them into a competitive crisis invest heavily in transformations.[8]

5. Acknowledgements

Organizations invest in information technology infrastructure for a variety of reasons. One dimension describing the investment strategy is the intention of achieving cost savings versus the intention to remain flexible and responsive to the marketplace. Of interest is the relationship between this cost-flexibility dimension and the extent to which services are provided as part of the firm wide infrastructure. A survey of CIOs reveals that organizations emphasizing cost tend to have less investment in firm wide infrastructure across a breadth of service types than those promoting flexibility. This implies that organizations pursuing a flexible strategy will provide a broader base of services that are common to all groups within the organization. Firms using a cost-based strategy tend to provide less infrastructure leaving many of the services incomplete or up to individual business units within the organization.

6. References

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