Assessing Information Technology Investments
With An Integrative Process Framework

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Abstract

We propose a framework for assessing and realizing the benefits from IT investment and an integrative process for prioritizing, justifying, and evaluating results of IT implementations. IT investments can drive changes in business processes. Our framework emphasizes identifying those changes so that responsibility for realizing benefits (financial and non-financial) can be assigned and evaluated. The framework addresses the “responsibility gap” that can prevent returns from being realized. The process aligns and prioritizes IT investments with strategy and considers the impact/leverage of such investments on activities across the entire value chain. Interviews and two case studies document the applicability of the proposed framework. Finally, we identify critical success factors for implementation, limitations, and implications for future research.

1. Introduction

Management processes for IT investments as an area of research receives minimal attention in the literature. The process includes prioritizing and justifying investments, and maximizing benefits from these investments across the organization’s value chain. Although IT investment is growing rapidly, the development of processes for managing such investments has not kept pace. The objectives of this paper are therefore to:

- Develop an integrative process framework for managing IT investments from proposal through implementation;
- Evaluate its feasibility through interviews and case studies; and
- Identify research priorities related to the process of IT investment management.

We propose an integrative framework that can be used for IT investment prioritization, justification, and ex post evaluation of results in order to extract value from IT investments. This framework is grounded in recent developments in the theory and practice of cost and quality management, and business process reengineering.

Our paper is motivated by the following three phenomena:

- Recent surveys report that senior executives are often concerned about whether they made the right IT investment decisions and whether proposed savings will materialize [1].
- No systematic processes are available to effectively measure the impact of proposed IT investments on decision making and activities across the entire value chain of the enterprise.
- There is a lack of integrative processes that help realize gains and/or cost savings from IT investments.

We propose that there often exists a “responsibility gap” when the individuals who justify the projects are not responsible for taking specific action steps to ensure that returns are realized.

We develop a framework to suggest a process for:

- Aligning and prioritizing IT investments with strategy;
- Considering the impact/leverage of each investment across the value chain;
- Developing ways to bridge the responsibility gap so that the promised cost savings and revenue enhancements are in fact realized.

The framework is drawn from cost management methods that recognize that people and equipment are the sources of cost and that such resources must be eliminated or redeployed to take cost out of the system [2, 3]. We emphasize the entire value chain because reengineering individual functions without considering their enterprise-wide impact compromises realization of benefits [4, 5]. We also use concepts from Activity-Based Management (ABM) to demonstrate how focus on individual activities across the value chain can help realize the projected benefits.
of reengineering [6]. The use of activity analysis to justify IT investments has important implications for managing risk of IT investments. Through identification of activities that will be impacted by the investment in IT, complementary organizational changes that are needed are clearly identified and managed.

The framework emerged from exploratory research methodology that applied concepts and practices from IS, cost management and management literature to the issue of IT investment management. Concurrently, we interviewed IS and financial managers from ten organizations to assess the severity of the responsibility gap problem and the feasibility of the emerging process framework. We then applied the resulting framework in two case studies.

The exploratory work presented in this paper makes a contribution by raising new research questions such as the issue of responsibility gap and by integrating lessons from quality management, cost management, and reengineering to the process of managing IT investments. The paper makes the following specific contributions to the IT investment literature:

- Focuses attention on how the concept of the responsibility gap prevents realization of value from IT investments;
- Focuses attention on the process level by developing a process framework that facilitates planning for investment, implementation and value realization;
- Complements work by Strassman [7, 8] that measures returns from IT by developing a framework that considers such returns and enables their realization;
- Addresses the prescriptions of Remenyi et al. [9] for continuous assessment of benefits from IT investments; and
- Proposes a research agenda in the area.

2. Need for a process framework

Information technology investments today support organizations by providing information to make and evaluate decisions, and by enabling new work processes. Methodologies such as Activity-based Costing (ABC), Activity-Based Management (ABM), and the Balanced Scorecard allow firms to identify activities, prioritize improvements, evaluate performance, and improve decision outcomes. Information obtained from such systems can also support business process reengineering [10]. Most benefits resulting from IT implementation occur only when decision makers use the information appropriately to induce changes in work activities. IT alone does not create benefits; it is the management process that uses IT to create benefits [11, 12]. New business processes and new organizations all appear to be necessary conditions for maximizing the benefit from IT [13, 14]. If specific responsibility for achieving proposed benefits is not assigned to individuals with authority to reorganize and restructure to exploit these investments, the projected benefits will not occur. Lack of processes for systematically analyzing the benefits from improved decision making or insuring that these benefits are realized gives rise to the responsibility gap that we address in the paper.

Today new business processes enabled by information technology often impact the extended enterprise value chain that includes customers, supply chains, and alliance partners. Full benefits come from integrating processes that cross business functions and organizations. ERP systems that link the enterprise, supply chain management modules, and product customization systems require changes to business processes across business functions. Systems that support collaborative arrangements between competitors to jointly design, manufacture and market products and services to enrich the customer result in new activities. Non value-added activities in such processes need to be eliminated. If resources are not redeployed from one function or business to another, cost savings and other benefits remain elusive. Successful results are the joint responsibility of many different managers who might even span organizational boundaries. This complicates the assignment of responsibility for assuring that all benefits are achieved. These factors all contribute to widening the responsibility gap, between the justification of IT investment and the realization of its benefits. The group that justifies the investment and articulates its benefits frequently does not have authority to take action steps required to realize the benefits. Moreover, the group that does have such authority is often not assigned the responsibility and time lines for taking action that leads to the realization of projected benefits.

This view is grounded in the literature related to quality and cost management, as well as assessments of reengineering efforts. Total Quality Management (TQM) methods have long called for the action steps necessary for realizing improvement goals to be clearly articulated and quantified; and for action step responsibility to be clearly identified as part of the continuous improvement process [10, 15]. Activity-based management (ABM) literature prescribes that non value-added activities that form parts of a process be combined or eliminated. It is only when resources are taken out of the system or put to value-adding use that cost savings can be realized [3]. The cost management literature suggests developing long-term strategies for cost reduction while ensuring that
necessary action steps are in alignment with this strategy [16]. A 1991 survey indicated that cost reduction targets were met only 50% of the time and only 32% of these companies raised profits to acceptable levels [16]. Evaluation of reengineering efforts led to similar conclusions. Kotter [17] emphasized the need to actively plan to create short term wins.

Hall, Rosenthal and Wade [18] reported that too many companies squander resources on reengineering projects that look like winners but fail to produce long-lasting bottom-line results. Key success factors include assigning "an additional senior executive to be responsible for implementation," and conducting a comprehensive pilot of the new design [p.128]. Those broad reengineering projects covering all business activities that drive competitive advantage obtained greater levels of business-unit and specific process cost reduction. Ghoshal and Bartlett [19] highlighted the merits of promoting informed decision-making with inputs from all parts of the organization. These findings support our view that the impact of IT investments must be investigated across the extended enterprise, and that the responsibility gap be addressed. The literature in TQM, cost management, and reengineering [3, 10, 15, 20] highlight the following necessary general conditions for success that apply equally to IT investments:

- Identifying enterprise-wide impact;
- Setting well articulated and quantitative goals;
- Identifying and assigning responsibility for action steps related to specific process activities and assigning responsibility;
- Ensuring that such action steps are aligned with strategic intent;
- Conducting comprehensive evaluations (audits) to measure progress; and
- Redeploying labor and equipment resources to take cost out of the system.

3. Measuring IT investment payoff

Traditional capital investment evaluation processes such as net present value, internal rate of return, and payback primarily utilize financial data [21]. However, managers do use qualitative arguments when benefits of capabilities are difficult to quantify [22]. Most firms rely on both financial and non-financial criteria in ex ante justifications of proposed information systems projects [23]. However, “there are no reliable measures for measuring the business value of IT” [11] because ex post evaluation of IT investment benefits is generally performed at the level of the firm or industry, and is not tied to the achievement of benefits from individual projects. Research on IT investment, both ex ante and ex post, focuses on outcomes or measures of IT benefits rather than the process of assessing and continually reevaluating the progress to date and the ability to achieve proposed benefits. Organizations cannot be assured that benefits will be realized because the IT investment alone creates no benefits; the effective decisions that result from the IT and/or the changes in business processes that accompany the deployment of the IT solution create the benefits. Without a process that measures these factors, IT investment may not pay off.

Firms use both non-financial and financial metrics in ex ante evaluations of IT investments. Bacon et. al. [23] reported that “support of business objectives” and “internal rate of return” were the top two criteria used to select high value IT projects. The Advisory Board [1] argues for the use of a portfolio of financial measurement methods. Strassman suggests “return on management” metrics [8, 24]. Information economics proponents include less tangible items such as improved customer service or improved competitiveness [25]. Others suggest the use of multi-objective, multi-criteria methods, value analysis, and critical success factors to measure intangible benefits [26]. The Balanced Scorecard approach can also augment financial metrics with goal related measures from the perspective of the customer, internal business process, and learning and growth [27-29].

Evidence of IT payoff has generally been weak and inconclusive [7, 13, 30-33]. Recent studies, however, find that more profitable firms have higher investments and expenditures on information systems per employee. IT increases productivity and creates substantial value for consumers although there is no evidence that these benefits result in supranormal business profitability [14, 34]. Ex post studies also ignore the impact of IT investments on the entire value chain and the complementary changes required to achieve maximum benefit from the technology [35]. The study by Tallon et al. [36] recognized this issue and discussed assessment of IT’s impact on business processes in the value chain.

Although there are numerous metrics for assessing the value from IT investments both pre- and post-investment, little work connects the ex ante assessment with any process to insure that the proposed benefits occur. One exception is the Active Benefit Realization approach suggested by Remenyi et al. [9] that calls for continuous benefit assessment. Although Remenyi et al.’s work defines a conceptual approach, there is still need for specific guidelines that evaluate the impact of investment decisions on the entire value chain, and the appropriate organizational changes necessary to achieve those benefits. Given the lack of connection between ex ante and ex post evaluations, our proposed responsibility gap must be bridged to link...
individuals who justify specific projects to those responsible for insuring that results do materialize.

4. Integrative process framework

Our proposed framework for IT investment analysis and evaluation ties together both ex ante and ex post justification and evaluation. We suggest that an investment committee with expertise in activity analysis work with the IT steering committee to gather information regarding the impact of IT investments on the entire value chain to help prioritize investment decisions. Once a project is approved, we suggest creating a responsibility committee, a cross functional team of managers impacted by the IT investment to insure that expected benefits are attained. This group shepherds the pre-investment evaluation through more detailed activity analyses, develops specific metrics and targets, and makes progress reports to top management. Our framework is therefore consistent with Remenyi et. al.’s [9] call for continuous assessment of benefits from IT investments. Table 1 outlines our framework for IT investment justification and evaluation.

Once a company creates its vision, we propose industry and value chain analysis as necessary first steps to insure that information systems initiatives are aligned with strategy. The industry analysis identifies the competitive forces to address. The value chain analysis provides information to focus IT investments and evaluate the potential benefits of competing proposals. For example, available data on cost, quality and cycle time dimensions of major activities within each part of the extended value chain can help identify processes that need improvement and evaluate the impact of investments across the value chain. These data allow the Investment Committee to proactively determine the targets to set as a result of implementing IT solutions.

The framework draws upon the product design literature to incorporate the “voice of the customer” in IT investment decisions. Providing and maintaining customer value should be the primary driver for most organizational decisions [37]. Quality Function Deployment (QFD) enables both customer and competitive priorities to be considered before investment in IT. Suggested as a tool to improve quality in the software development process [38], QFD has not been used to guide IT investment decisions. Only recently was it suggested as a tool in capital budgeting [39]. QFD insures that customer priorities are addressed by a systems solution and analyzes competitive offerings. QFD can therefore help assess the need for an IT solution after giving due consideration to industry forces.

In the IT Evaluation phase, the investment committee must identify all major activities across the value chain impacted by the investment. Activities may be altered because IT either enables new business processes or provides information that impacts decisions that can subsequently alter activities. The industry, value chain, and activity analyses form the basis for monitoring and selecting IT projects. Cost and cycle time data can be used to evaluate attainable cost and cycle time reduction targets. Responsibility should be assigned to a cross functional group that has the authority to insure change. We believe that it is important to reconsider the competitive issues identified in the first phase after individual projects are evaluated because of the prime importance of strategic considerations.

Figure 1 demonstrates the iterative nature of the proposed process. As in Boehm’s “spiral model” [40], we suggest that investment decisions be periodically re-evaluated as additional information is collected. After each iteration it may be appropriate to complete a more detailed activity analysis and set specific, revenue, cost, time, and quality targets for these activities. This helps close the responsibility gap by ensuring that investment justification parameters and projected benefits are communicated to groups with authority across the value chain and responsibility is assigned for the realization of such benefits.

Our process framework has the following distinctive features that stress its integrative nature:

- It focuses on activities across the value chain critical to effective cost management [3].
- It recognizes the need to redeploy resources to realize cost/quality/time improvements by using knowledge of specific activities that must be targeted [3, 41].
- It requires that appropriate metrics be identified in both the IT justification and IT evaluation stages, and
- It recognizes the linkages between operational and financial metrics, as in The Balanced Scorecard approach [27].

Because activities are the units that must be eliminated from processes to realize gains, we propose building a database of such activities across different business processes. Any IT proposal can then be described by the set of activities, across business processes, to be impacted. Available cost and cycle time data can be summed to provide an estimate of potential gains. These activities can be assigned to the Responsibility Committee for elimination. The process ensures that projected gains identified and quantified through activity analysis are actually realized by specifying action steps impacting individual activities.
Table 1. IT investment justification and evaluation

<table>
<thead>
<tr>
<th>Process</th>
<th>Objective</th>
<th>Responsibility*</th>
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<tbody>
<tr>
<td>Vision</td>
<td>Goals</td>
<td>Steering Committee (P)</td>
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<td></td>
<td></td>
<td>Investment Committee (S)</td>
</tr>
<tr>
<td>Industry Analysis</td>
<td>Analyze forces of competition in industry</td>
<td>Investment Committee (P)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steering Committee (S)</td>
</tr>
<tr>
<td>Value Chain Analysis</td>
<td>• Analyze customer needs and preferences</td>
<td>Investment Committee (P)</td>
</tr>
<tr>
<td></td>
<td>• Identify critical activities within each part of the value chain</td>
<td>Steering Committee (S)</td>
</tr>
<tr>
<td>IT Evaluation</td>
<td>• Determine whether IT investment affects critical activities or if it will change, eliminate, or add other activities in other parts of the value chain</td>
<td>Investment Committee (P)</td>
</tr>
<tr>
<td></td>
<td>• Determine whether IT enables decisions that will impact activities across value chain</td>
<td>Steering Committee (S)</td>
</tr>
<tr>
<td></td>
<td>• Develop metrics for decision outcomes and activities impacted by IT investment</td>
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<tr>
<td>Targets and Responsibilities</td>
<td>• Assign responsibility for cost savings/revenue generation to a cross-functional group</td>
<td>Steering Committee (P)</td>
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<tr>
<td></td>
<td>• Set revenue, cost, time, quality targets for activities across the value chain</td>
<td>Investment Committee (S)</td>
</tr>
<tr>
<td>Post Investment Audit</td>
<td>• Review and update materials for decision outcomes and activities</td>
<td>Responsibility Committee (P)</td>
</tr>
<tr>
<td></td>
<td>• Update progress towards goals</td>
<td>Steering Committee (P)</td>
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<tr>
<td></td>
<td>• Responsibility Committee reports progress to investment committee;</td>
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<tr>
<td></td>
<td>• Feedback to adjust process. Return to targets and responsibilities as needed.</td>
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*P = primary responsibility, S = secondary responsibility

Figure 1. Spiral model for investment analysis

A systematic implementation of the process framework involves use of process mapping. Individual processes across the value chain need to be analyzed to identify major activities. The cost, time and quality measures of each activity are determined next. The methodology for obtaining these measures is part of the tool kit used in activity-based costing (ABC) or activity-based management (ABM) implementation. Determining cost, time and quality values for each activity requires gathering information about people and equipment costs for each part of the value chain. Next, individuals are interviewed to obtain estimates of people and equipment time associated with each activity. These estimates are then used to obtain cost, time and quality values for each activity.

5. Case studies: information technology in product engineering

We now present two case studies in which we applied our framework for IT evaluation at Air Products and Chemicals Inc., a fortune 500 company. In the first case, we illustrate how this process
supported investment in an activity based costing and management system to improve decision making. This system was justified solely on benefits resulting from one decision that Air Products could have made with information from the system. In the second case, we evaluate investment in a product configuration system to support mass customization of the distributed control systems for engineered plants [42]. A product configurator serves as a repository for design information and rules, identifies equipment for various product configurations, and creates engineering drawings, specifications, and product orders shared immediately with customers. While Air Products was successful in applying mass customization to several high volume product lines, initial analysis indicated that design configuration was not cost effective due to the low number of engineered plants and the high cost of the distributed control systems customization initiative. However, application of our framework resulted in new work processes that led to a different IT investment than initially considered. Instead of developing a product configurator for each plant, the equipment design process was modularized and product configurator systems supporting each module were demonstrated to be cost effective.

Table 2 illustrates the process for each case study, beginning with identification of vision and goals; the accompanying industry analysis and value chain analysis. It also highlights the role of the investment committee at each step. The outcome of each step in the process is listed and the use of tools such as Quality Function Deployment (QFD) and activity analysis is also described in Table 2 and examples are included in Figures 2 and 3. Finally, the roles of the responsibility committee are described in the category: “targets and responsibilities.”

6. Interviews and discussion

These case studies illustrate the applicability of our framework for:
- Evaluating and justifying IT investments;
- Improving decision quality;
- Assessing impact of IT investments on activities across the value chain; and
- Identifying effective technology solutions.

In the first case, the company demonstrated the system’s benefits by focusing on one specific decision. In the second case we found that the process revealed an unanticipated application of information technology that supports new business processes. Without this approach, the company might have purchased information technology that supported traditional work processes and missed out on the full benefits possible from that technology.

As a part of our study, we interviewed managers in 10 companies to identify challenges posed by our framework. Five interviews were conducted with financial managers and five with IT managers. These companies were drawn from different industries including packaging, food, chemicals, education, electronics, consulting, software, consumer products, and financial services. The managers identified four major challenges:
- Identifying critical activities;
- Obtaining data to assess the impact of IT on metrics associated with activities;
- Altering performance metrics to realize improvements;
- Making post investment analysis a priority.

Whereas the case studies addressed the first two challenges, the latter two need further investigation.

Managers doubted that they could identify all activities impacted by the introduction of information technology. One manager commented, “With IT, you often are changing what the future organization will look like. How will you come up with metrics for an unknown organizational form?” Another manager stated, “Not all benefits can be translated into something that is activity based.” Our case studies demonstrate that not all activities or benefits must be identified beforehand. The activity analysis need only be completed at a high enough level to make the decision to move forward. More detailed activity analysis is accomplished at each stage of the project. Moreover, companies implementing Activity-based Costing (ABC) and Activity-Based Management (ABM) methods as part of their overall cost management program already have access to activity based information, including the identification of all activities within each process in the value chain, the cost of performing these activities, the time to complete these activities, and the quality associated with these activities. Such data could then be accessed by all groups engaged in prioritizing, evaluating, and realizing value from IT investments and the impact of proposed IT investments can be analyzed. Firms with ABC/ABM implementations are uniquely positioned to successfully implement our proposed process framework.

Identifying activities to alter may require new organizational structures such as business process teams or cross-functional teams. These structures may be more appropriate to realize the full benefits from the system. Performance metrics can be adjusted accordingly. Our expectation is that firms with established performance evaluation systems using non-financial metrics such as the Balanced Scorecard may be better equipped to close the responsibility gap. Because assigning responsibility without aligning incentives is obviously counterproductive, incentives
Table 2. Application of IT justification process

<table>
<thead>
<tr>
<th>Process</th>
<th>ABC System</th>
<th>Product Configurator for Plant Controls</th>
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<tbody>
<tr>
<td>Vision</td>
<td><strong>Goal</strong>: Gather and use information on true costs of products to enable decisions that reduce cost, improve cycle time and quality, and facilitate accurate budgeting/planning of resources and initiatives. <strong>Investment Committee</strong>: Headed by Global Product Engineering Manager with participants from engineering, marketing, and operations.</td>
<td><strong>Goal</strong>: Extend mass customization using product configurator to design of distributed control systems for engineered plants. <strong>Investment Committee</strong>: Headed by Global Product Engineering Manager with participants from engineering, marketing, operations, and external suppliers.</td>
</tr>
<tr>
<td>Industry Analysis</td>
<td>Competition driven by cost, quality, and cycle time.</td>
<td>Demand for customized items rapidly increasing.</td>
</tr>
<tr>
<td>Value Chain Analysis</td>
<td>• Identified customer requirements of every segment</td>
<td>• Identified important customer attributes</td>
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<td>• Summarized requirements in a high level Quality Function Deployment (QFD) matrix shown in Figure 2.</td>
<td>• High-level activity analysis for Engineering work processes demonstrated that work process revision makes mass customization cost effective.</td>
</tr>
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<td>• QFD process indicated ABC system would contribute to speed/real time data, lower cost/value realization, and product development strategy.</td>
<td>• Process improvement achieved by modularizing the design of the distributed control equipment</td>
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<td></td>
<td>• High level activity flow diagram shown in Figure 3 indicated areas where activities would be impacted by decisions resulting from information in the ABC system.</td>
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<tr>
<td>IT Evaluation</td>
<td>• Investment committee estimated benefits from one decision using information from ABC system: <em>Would the high volume line of specialty gases and chemicals equipment for the electronic industry benefit from mass customization?</em></td>
<td>• Resource requirements for each activity were compared for a traditional “engineered to order” plant with a modular approach</td>
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<td>• Demonstrated savings of more than $1.4 million just through inventory reduction, reliability improvement, and maintenance cost reduction for a single major component of this product line.</td>
<td>• Differences in costs were estimated using activity data for two completed projects.</td>
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<td>• Costs for each activity were normalized to accommodate differences in the scope of the two plant projects.</td>
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<td></td>
<td>• Total expected difference in process engineering hours per plant resulted in a savings of almost $45,000 per plant, which given current business volumes translated to a savings of more than $.5M per year.</td>
</tr>
<tr>
<td>Targets &amp; Responsibilities</td>
<td>• Responsibility Committee formed from Investment Committee</td>
<td>• Cross functionality in design teams will be promoted.</td>
</tr>
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<td></td>
<td>• Responsibility Committee plans to complete activity analysis for each product line to determine root cause cost drivers</td>
<td>• Key performance indicators set up by Engineering Manager.</td>
</tr>
<tr>
<td></td>
<td>• Responsibility Committee to set up key performance indicators</td>
<td>• Responsibility assigned to design owners</td>
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<tr>
<td></td>
<td></td>
<td>• Progress against indicators reviewed by Engineering Management on a quarterly basis.</td>
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<td></td>
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<td>• Change management work process set up to control design documentation.</td>
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for the people responsible for realizing return from IT investments must be redesigned. The chemical company was in the process of designing key performance indicators for the two systems that directly tie benefit assessment to key indicators.

Although managers support post-investment audits, time constraints and lack of data usually forestall these audits. Post-investment audits should be a priority in organizations. Audits elicit information about completed projects, and can provide guidance for future projects. Our case studies set the stage for a process accomplished iteratively at increasingly detailed levels of activity. If the process works at each stage, incentive exists for activity analysis for the next stage to insure that benefits are achieved.

The above findings and analysis suggest several
issues discussed in the literature and supported by interviews, the framework is not bolstered by a large sample survey that firmly establishes the existence and severity of the responsibility gap. Second, this exploratory paper does not test any propositions. Instead, it concludes that considering activity level impact and identifying benefits across the value chain leads to increased confidence in investments; and that assigning responsibility to cross-functional teams leads to increased return on investment. Additional case studies and large sample analyses are required to test these propositions. Finally, the case studies are derived from a single company and do not cover all the aspects of our proposed framework. Future research should address these limitations.

8. Future research strategies

Our objective is to identify and stimulate research surrounding the responsibility gap that exists between groups that approve IT investments and those charged with taking action to realize the full benefits of the investment. Our interviews with IS and financial managers revealed that existing practices support the notion of this gap. Two significant streams of research could follow the analysis presented in this paper. The first deals with the responsibility gap and the other deals with the process framework.

Future field-based research can allow researchers to study the responsibility gap phenomenon more closely. Such investigations can be aided by existing management theories, or give rise to new theories\(^1\). The exploratory work presented in this paper makes a contribution by raising new research questions regarding the responsibility gap and informs other research methods by integrating lessons from quality management, cost management, and reengineering into the process framework. The literature on cost management contains many examples of field studies that deal with emerging methods and practices in this manner [44-46].

The following represent important research questions and methods that may be used to systematically study the responsibility gap and the process of IT investment:

- How pervasive is the responsibility gap? Surveys of IT professionals and financial executives may help operationalize this construct and measure the extent to which this gap exists in different industries.

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\(^1\)For examples, Young’s commentary on field research methods in managerial accounting provided examples of studies that tested existing theories, developed theories, raised new research questions, and informed other research methods [43].
What are the characteristics of firms that report lower levels of this responsibility gap? Surveys can identify industry, firm, business unit characteristics. Additional analysis could include the relationship between maturity of quality management programs, use of the Balanced Scorecard approach, etc. and the level of the responsibility gap.

Does the extent of value realization from IT investment vary with the type of IT application and the part of the value chain to which it is applied? This could be investigated using both surveys and field research.

What organizational issues relate to effectively managing this gap? Field studies could investigate issues such as organizational structure, culture, change management practices, and communication strategies as they relate to realizing IT investment benefits.

How do companies extract the full value of IT investments? Field studies can unearth best practices and identify additional success factors that enable realization of full benefits.

Does the presence of Activity-based information systems help bridge the responsibility gap? Since Activity-based Costing (ABC) and Activity-based management (ABM) methods provide activity based information, surveys and field studies may be used to examine the relationship between the level of ABC/ABM implementation, prevalence of the responsibility gap, and realization of IT investment benefits.

9. Conclusions

This paper proposes that an integrated “process framework” can help evaluate IT investments and lead to achieving full benefits from IT investments because it addresses the responsibility gap. The framework is well grounded in lessons derived from studies of quality management, cost management, and reengineering efforts. We explore the feasibility of the framework through interviews and case studies. The paper contributes to the IT investment literature by identifying a “problem” phenomenon, obtaining some preliminary field validation and providing some new research ideas in this area.

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