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USING THE BALANCED SCORECARD TO ACHIEVE SUSTAINED IT-BUSINESS ALIGNMENT: A CASE STUDY

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ABSTRACT

High levels of investments in IT and related products and services by firms over the last several decades produced only mixed results. Research shows that one of the most significant determinants of successful IT investments is the alignment between IT and the competitive strategies of a firm. Yet it is largely unclear to both researchers and practitioners how to achieve such alignment in the complex business environment. In this paper, we present and analyze the findings from a case study on how one company uses a well-established strategic management tool, the balanced scorecard, as the framework for aligning its IT initiatives with business strategies. The result is a forward-looking, strategy-oriented corporate culture and financial success for the company. Based on our findings, we expand the Reich and Benbasat alignment model by adding relationship management as an antecedent of alignment and balanced scorecard as a tool for achieving, managing, and sustaining such alignment. Managerial and research implications are discussed, as are directions for future research.

KEYWORDS: IT alignment, IT strategy, IT Investments, business strategy, balanced scorecard

I. INTRODUCTION

Studies show that the lack of alignment between IT and business strategies is one of the main reasons why firms fail to realize the full potential of their IT investments [Benko and McFarlan, 2003; Broadbent and Weil, 1993; Croteau and Bergeron, 2001]. Conversely, firms that achieve a high degree of alignment are often associated with better overall business performance [Broadbent and Weil, 1993; Croteau and Bergeron, 2001; Kearns and Lederer, 2003; Prairie, 1996]. As a consequence, the strategic alignment between business and IT is consistently one of the top issues of business executives and IT managers around the world [Luftman et al., 1993; Sabherwal and Chan, 2001]. In a 2004 survey of CIOs and top executives [Luftman and McLean, 2004], IT and business alignment rose to be the top concern. Luftman et al. [1993] argue that in the increasingly competitive global markets, business success depends on the harmony of business strategy, IT strategy, organizational structure and processes, and IT infrastructure and processes. It is not sufficient for firms to work on those areas in isolation, given the extent to which IT is embedded in business processes, products and services, and the information requirement in a fast-changing market condition.

Recognizing the importance of aligning IT with business and the fact that firms struggle to achieve such alignment, IT researchers and practitioners alike made many attempts to address the issue of how to achieve alignment [Baets, 1992; Chan et al., 1997; Chan, 2002; Hoffman, 2003]. From the strategic alignment model by Henderson and Venkatraman [1993] to the social dimension alignment model of Reich and Benbasat [2000], a number of frameworks and methodologies were developed. Some were adopted by a variety of companies [Luftman, 1996; Prairie, 1996]. Yet, "alignment is not a state, but a journey—one that is not always predictable, rational, or tightly planned" [Chan, 2002, p. 98]. Strategic alignment requires not only a set of steps and procedures, but also a continuing process that can align, monitor, and adjust in order to stay on track over a long period of time, and one that is capable of handling contingencies and inevitable changes in organizations and the marketplace. To that end, Luftman [2000, 2003] proposes an IT/Business Alignment Maturity model, which measures the level of IT/Business alignment based on six categories of indicators, to serve as a comprehensive tool for organizations to determine where they stand and what needs to be done to achieve higher levels of alignment. In conjunction with the bottom-up approach of the maturity model, we argue that a top-down approach with a clear focus on business strategy would be essential to create an effective alignment system.

What is clearly called for, as a logical extension to the current alignment literature and the maturity model, is the development of a strategy-driven framework that encompasses major phases of alignment and from which processes, measures, and checkpoints can be improvised or incorporated in the context of a specific organization. Our research questions for this study, therefore, center on two aspects of alignment:

1. Is there a strategy-driven management system firms can use to achieve alignment?

2. If so, how would the use of such a system enhance the factors for alignment, as identified by previous studies?

To address these questions, we use the Reich and Benbasat alignment model [2000] as a guide. We investigate how one company achieved a high degree of business-IT alignment and stayed on track while going through major organizational and market changes, with the help of the balanced scorecard. We also show how other managers might use the alignment mechanism and process developed in the company in their own specific environment to achieve, manage, and sustain strategic alignment between business and IT.

ORGANIZATION OF THE PAPER

In Section II, we review the literature on the significance of IT alignment and the proposed research frameworks for assisting managers to achieve alignment. We also introduce the balanced scorecard developed by Kaplan and Norton [1992; 1996b] and argue that it can be used as a mechanism for managing the alignment process and keeping companies staying on the track. After a discussion of the research methodology (Section III), we describe the company studied and its alignment process, and present and discuss the data collected to substantiate and extend the research model (Section IV). In section V, we offer lessons learned and future directions for both researchers and practitioners.

II. RESEARCH BACKGROUND

ALIGNMENT BETWEEN IT AND BUSINESS STRATEGIES

Even though the initial concept of strategic alignment between IT and business can be traced back to the late 1970s [Luftman and Brier, 1999], it was not until the introduction of the strategic alignment model by Henderson and Venkatraman [1993] that systematic research on and understanding of the alignment began to take place. In this model, they argue that strategic alignment between IT and business requires:

- four building blocks
  - business strategy,
  - IT strategy,
  - organizational infrastructure and processes,
  - IT infrastructure and processes, and
- two fundamental relationships
  - strategic fit, and
  - functional integration.

Strategic fit recognizes the need for any business or IT strategy to address both external and internal domains of a firm, and subsequently guides the functional integration that concerns how the choices made in the IT domain impact those made in the business domain and vice versa.

Luftman [1996] extends the strategic alignment model by classifying the four main components (business strategy, IT strategy, organizational infrastructure, and IT infrastructure) into three domains:

- Anchor: The anchor domain is the catalyst or the enabler of a particular perspective;
- Pivot: The pivot domain is the area whose problems or opportunities being addressed in a particular perspective; and
- Impact: The impact domain is the area that is being affected by the changes to the pivot domain.

Based on this model, for example, the strategic execution perspective uses business strategy as the anchor domain, organizational infrastructure as the pivot domain, and IT infrastructure as the impact domain. Luftman also argues that the application of the strategic alignment model is more than just assessing the components of the model, identifying the initial perspective and planning the approach, and then applying it. Instead, he suggests that alignment should be a continual process, in which the previously identified pivot domain becomes the anchor domain and the previous impact domain becomes the pivot domain in the next iteration.

To make the strategic alignment model closer to an operational framework for practitioners, Henderson and Venkatraman [1993] further suggest four alignment perspectives, each focusing on one building block of the alignment model.

- Strategic Execution: The strategic execution perspective reflects the notion that business strategy should be the driver for both organizational design and IT infrastructure choices.
- Technology Potential: The technology potential perspective focuses on developing an IT strategy in response to a business strategy and defining the corresponding IT infrastructures and processes.
- Competitive Potential: The competitive potential perspective focuses on the exploitation of emerging IT capabilities to impact new products and services, influence key attributes of strategy, and develop new forms of relationships.

- Service Level: The service level perspective focuses on building a world-class IT service organization.

The strategic alignment model, even with the four perspectives articulated, remains a high-level conceptual map, which by itself does not reflect the dynamic aspects of achieving strategic alignment over time [Henderson et al., 1996]. Subsequently, researchers continue to pursue operationalizing the model in a variety of ways in different organizational contexts. Luftman and Brier [1999] propose a six-step approach to accomplish alignment, created specifically to target the enablers and inhibitors of the strategic alignment identified in a survey of business executives of large U.S. firms. In a significant departure from the strategic alignment model, Prairie [1996] presents the IT strategic alignment benchmarking approach used at IBM consulting services. She argues that by studying the management processes of the firms that achieved high degree of alignment between business and IT strategies, proven processes can be identified for implementation in other organizations. Perhaps the most comprehensive attempt to operationalize the measures of IT/Business alignment to date is the alignment maturity model developed by Luftman [2000, 2003]. In this model, Luftman proposes five levels of IT-Business alignment benchmarks, based on indicators in six categories that cover a wide range of business and IT issues, which can be used by organizations as a tool to assess their level of alignment.

While many researchers focused on the mechanics to achieve strategic alignment by developing process-oriented frameworks or methodologies that management can adopt, others chose to address the soft factors that may impact the alignment processes with more enduring effects. After studying the strategic alignment of ten business units in three organizations, Reich and Benbasat [2000] found that in the short term, shared domain knowledge between IT and business executives and successful IT implementations leads to better communications between business and IT executives. In conjunction with stronger connections between business and IT planning, short-term alignment is achieved. In the long run, however, they conclude that shared domain knowledge between IT and business executive matters the most to strategic alignment.

Asking, "Why haven't we mastered alignment," Chan [2002] suggests that total IT and business alignment is complex and difficult to achieve.

> "*In fact, IT alignment is best described not as a uni-dimensional phenomenon but as a superset of multiple, simultaneous component alignments that bring together an organization's structure, strategy, and culture at multiple (IT, business unit, and corporate) levels, with all their inherent demands*" [Chan, 2002, p. 99].

She argues that the informal structures (e.g., relationships between business and IT executives, trust, culture, and communications) are more important to, and more enduring in achieving alignment than commonly recognized formal structures (e.g., governance, location, and infrastructure). Chan, like Reich and Benbasat, stops short of offering an operational framework for achieving the important aspect of soft alignment.

In summary, after more than two decades of academic research and managerial practice, the significance of alignment between IT and business strategies is widely recognized. Yet, achieving alignment remains a challenge in many organizations today. For academics and IT practitioners, the question of *how* to accomplish strategic alignment between business and IT in the complex and dynamic environment of the real world remains largely unanswered. However, in the 1990's, a strategic management tool, the balanced scorecard, gained increasing popularity in organizations. And, as some researchers noted [Huang and Hu, 2004; Van Der Zee and De Jong, 1999], it is a potential tool or framework for implementing and sustaining the strategic alignment between IT and business strategies.

BALANCED SCORECARD AS A PERFORMANCE MEASUREMENT TOOL

Kaplan and Norton [1992] presented the concept of a balanced scorecard system for measuring firm performance from a holistic perspective[1]. They argue that traditional financial accounting measures, such as return on investment or earnings per share, only give limited or even misleading signals for competitive business activities, because they are lagging indicators of business health of the past. Instead, the balanced scorecard outlines both a firm's current operating performance and future performance drivers by tracking and measuring four dimensions of business: financial, customer, internal processes, and innovation and learning.

Financial measures indicate whether and how the firm's strategies and operations contribute to business improvement. Commonly used financial measures include revenue growth and mix (growth indicator), return on investment, operating income, gross margin (prosperity indicators), and cash flow (survival indicator).

From the customer perspective, the balanced scorecard helps managers translate their concept of customer service, satisfaction, and value into specific measures of the factors that really matter to customers. The appropriate measures stem from customer's usual concerns, such as response time, quality, service, and cost.

To deliver on the value propositions of customers and to satisfy shareholder expectations, managers need to identify those internal processes in which the firm must excel. The internal business process measures for the balanced scorecard are derived from the business processes with the greatest impact on customer satisfaction and financial performance, such as cycle time, quality, and productivity.

The balanced scorecard uses the innovation and learning perspective to address the drivers of future business. The ever-changing market, technology, and competitive landscapes mean that a firm must build an infrastructure for long-term growth and improvement and track its ability to innovate and learn. Commonly used measures for learning and innovation include patent productivity, rate of new product development, and strategic personnel availability.

Since its inception, the balanced scorecard has been widely adopted by firms and claimed an important role as a performance management tool for businesses [Kaplan and Nolan, 1996b; Lipe and Saltero, 2002; Sim and Koh, 2001]. In addition to applying the balanced scorecard to the organization as a whole, attempts were made to apply the balanced scorecard to performance measurement in more narrowly defined corporate functions such as IT department [Martinsons et al., 1999; Van Grembergen and Saul, 2001; Van Grembergen et al., 2003], project management [Eickelmann, 2001], quality management [Solano et al., 2003], and electronic commerce [Hasan and Tibbits, 2000].

BALANCED SCORECARD AS A STRATEGIC MANAGEMENT TOOL

The balanced scorecard is a management system, not a ready-made performance indicator. To implement the balanced scorecard successfully, a firm needs to populate the four perspectives carefully with data designed to measure the factors necessary to carry out its vision and strategy [Kaplan and Norton, 1992; Otley, 1999]:

- the knowledge, skills, and systems needed to improve the business continually (innovation and learning perspective),

[1] A brief explanation of the Balanced Scorecard is given in the Appendix. For extensive discussions, see Kaplan and Norton [1992, 1996a, 1996b].

- the factors necessary to build strategic capabilities and efficiencies (internal process perspective),
- values that customers seek (customer perspective), and
- financial performance that maximizes the shareholder value (financial perspective).

The relationships among these four perspectives form the core of the balanced scorecard theory of business: firms that continually improve their capabilities for learning and innovation to achieve better performance in their internal business processes. Improvement, in turn, leads to more effective execution of their customer value propositions and eventually results in sustained competitive advantage and improved financial performance [Kaplan and Norton, 1996a]. In this way, the balanced scorecard becomes a plan for strategy implementation, linking all the components identified based on the vision and strategy. The interdependent relationships lead to strategy execution as evidenced by financial performance [Kaplan and Norton, 1996b].

Since the concept's inception, the balanced scorecard theory and practice are supported by numerous case studies and empirical analyses [Butler et al., 1997; Kaplan and Norton, 1996a, 1996b, 2001a, 2001b; Robinson, 2000; Sim and Koh, 2001]. Kaplan and Norton [2000] further formalize this strategic management tool in the form of the "strategic map" and have applied the map at a number of organizations. Attempts to integrate the balanced scorecard with other management tools (e.g., critical success factors [Maltz et al., 2003]), and to complement it with other perspectives (such as stakeholder approach [Atkinson et al., 1997]) try to make it an all-encompassing strategic planning and management tool.

BALANCED SCORECARD AS AN IT MANAGEMENT TOOL

The balanced scorecard was only recently adopted as a theoretical model for MIS research. Initially, the focus was on building an "IT balanced scorecard," using the four perspectives of the balanced scorecard as a holistic approach to managing IT projects or IT departments [Martinsons et al., 1999; Rosemann, 2001; Symons, 2004]. Martinson et al. [1999], for example, outline a methodology for constructing the balanced scorecard for strategic IT management, and Van Grembergen and Saul [2001] explore the practice of building an IT scorecard along with those of other business units.

While the proposed IT balanced scorecard approach produces a seemingly appropriate tool for managing IT, it also tends to isolate the IT functions from the corporate strategy. An independent IT balanced scorecard, however well constructed, may not reflect the business strategies of a firm, resulting in misalignment of IT and business strategies [Koch, 2003]. A few recent studies tried to take advantage of the real strength of the balanced scorecard, integrating business functions based on corporate strategy, in applying this tool to the management of IT. For example, Huang and Hu [2004] demonstrate how the balanced scorecard can be used to guide the integration of Web services technology with a firm's competitive strategies to maximize the benefits of this new technology. They propose a framework that matches the potential technical benefits of web services with the chosen business strategies in terms of the web services' contributions to the four perspectives of the balanced scorecard. Van Der Zee and De Jong [1999] explore the ways of integrating business and IT management by examining two cases of building corporate balanced scorecard with IT in mind. They argue that the balanced scorecard offers two unique benefits:

- Business and IT management can use the same performance measurement language, enabling discussions on what IT can do to support business performance.
- IT can be managed using an integrated planning and evaluation cycle as other business processes.

What remain largely unexplored are the actual mechanisms of how the balanced scorecard can be implemented as an IT-business alignment system, particularly within the frameworks of previous alignment studies.

III. RESEARCH METHODOLOGY

RESEARCH APPROACH

To address our research questions—strategy-driven management systems for IT-business alignment and the underlying factors that make them work—we explore how firms can use the balanced scorecard as the mechanism to align IT (and other corporate functions) with business strategies. We adopt the Reich and Benbasat [2000] alignment model as the initial theoretical guide for our study, because it is largely consistent with literature that emphasizes the informal structure of alignment [Chan 2002, Luftman and Brier 1999], while assuming the existence of a process for executing the strategic alignment proposed by, among others, Henderson and Venkatraman [1992] and Luftman [1996]. This model, anchored on the social dimensions of alignment, suggests that the alignment is achieved through two mechanisms:

- communications between IT and business managers and
- connections between IT and business planning processes

and two antecedents

- the shared domain knowledge among IT and business managers and
- successful IT history.

Figure 1 summarizes the construct of the Reich-Benbasat alignment model (adapted from Reich and Benbasat [2000]).

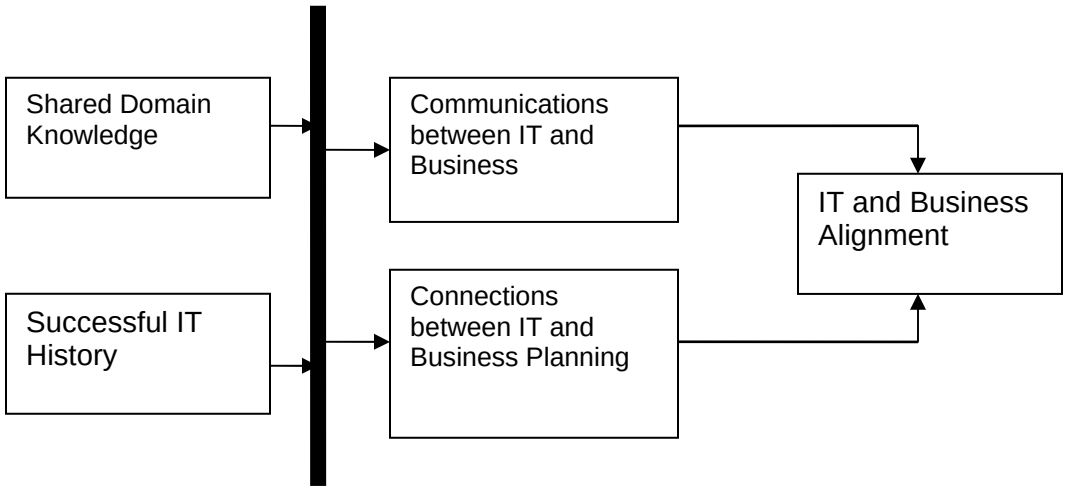

Figure 1. Reich-Benbasat Alignment Model

CASE STUDY METHOD

We chose case study as our research methodology, because it is most appropriate when “a ‘how’ or ‘why’ question is being asked about a contemporary set of events, over which the investigator has little or no control” [Yin, 2003, p. 9]. Further, case study is regarded a viable IS research strategy when studying state-of-the-art IS questions in a natural setting, and when investigating

an area where little or no previous research exists [Benbasat et al., 1987]. Our research questions satisfy both these criteria.

We adopt *a priori* theories—the Reich-Benbasat model and the balanced scorecard—that are used to guide the site selection and data collection. However, the focus is on building, adding to, and elaborating theory in a grounded and inductive fashion, rather than testing hypotheses [Eisenhardt, 1999]. For this purpose, we engaged in a single-case, embedded design [Yin 2003, p. 40]. We followed a theory-based case sampling strategy, attempting to select an example of the theoretical construct and thereby to elaborate and examine it [Paré, 2004]. More specifically, to investigate how the balanced scorecard system can be used to align a firm's IT and business strategies, a revelatory case was carefully identified where the system was recently implemented with strong top management sponsorship and CIO involvement. When conducting the research, we focused on the whole organization at the case level, while giving equal attention to the IT department and other business departments.

The research is structured into three phases:

- identification and formulation,
- data collection and analysis, and
- theory building and validation.

Identification and formulation. This phase started with a literature review of the main research areas and the construction of an initial research framework. The research framework guided the early design of the research and the site selection. We queried companies in our region and identified one that implemented balanced scorecard as its strategic management tool with reasonable success. We then contacted the company and managed to gain the support of the CIO and other key managers for a case study. To refine the initial research framework, we pre-tested it with our key informant—the CIO of the case company—and added to and clarified its constructs. A case study protocol was then developed, identifying the objectives of the study, field procedures, interview guidelines, and a plan for the final report [Paré, 2004; Yin, 2003].

Data collection and analysis. Data collection includes a variety of techniques, such as company documentations, archival records, public and published information, semi-structured interviews, and follow-up email and telephone discussions. For field interviews, we selected informants by using the "maximum variation" and the "snowball" techniques, suggested by Paré [2004], to cover different perspectives and identify appropriate personnel. We enlisted informants of diverse background and stopped the process only when their responses became too similar to offer additional insights. As a result, we interviewed the CEO, the CIO (multiple times), three vice presidents (VP I, II, and III, in charge of operation, external-facing corporate function, and internal-facing corporate function, respectively), and an IT manager.

All interviews were semi-structured, based an open-ended questionnaire. They were conducted on premise and lasted 45 to 90 minutes. When conducting field interviews, we employed the "unique team role" technique, suggested by Eisenhardt [1999], where one researcher handles the questioning and recording, while the other makes side comments and observations. Ongoing field notes were kept to highlight the key facts and views to supplement triangulate the transcripts from multiple interview recordings.

The initial data analysis overlapped with data collection by keeping the initial research framework tentative and flexible [Eisenhardt, 1999]. With each new interview transcript and other documents, we re-examined the initial framework, trying to verify the existing constructs and discover new ones. We then incorporated the evolved framework into upcoming interviews as well as follow-up discussions with previous interviewees (mostly via emails). We also relied on

triangulation of different sources of data in the analysis stage. The data collection and analysis phase took place between late 2003 and early 2004.

Theory Building and Validation. After all the data were collected, we attempted to identify repeated and matching patterns from all data sources and construct a raw case, with verifiable data such as quotes from interview transcripts and written documents. The raw case was then compared to existing models, looking for emerging themes and concepts from this raw case [Klein and Myers, 1999; Lee, 1989]. Finally, the case report was created to demonstrate the objective reality and the theoretical construct (the resonance criterion) and to illustrate how this case study and its results are applicable and actionable (the empowerment and applicability criteria) [Lincoln and Guba, 2002].

THE CASE COMPANY

The case company, "BIOCO," is a medium-sized bio-pharmaceutical company located in the southeast United States. The company develops, produces, and markets vaccines and antibody-based biopharmaceutical products that prevent and treat infectious, autoimmune, and addictive diseases. In the year leading to the case study, BIOCO marketed several revenue-generating products. In addition, multiple clinical trial programs were underway aimed at bringing products in the pipeline to market within a few years. The healthy and growing state of the company was acknowledged by the investment community, as indicated by its stock price, reaching an all time high in early 2004.

To get to where it was when the case study was undertaken, BIOCO made considerable progress in nearly completely transforming itself. Prior to 2000, BIOCO relied on a business model that was in decline due to a number of factors, and the company's financials suffered as a result. The then-Chief Operating Office (who has since been promoted to CEO and President) initiated a series of strategic restructuring and reorganization efforts to transform the company into a new biopharmaceutical business. As part of this transformation, he and the CIO championed the balanced scorecard in 2000 as a strategic management tool. When the case study was being conducted, BIOCO had successfully adopted the balanced scorecard at both the corporate and the department levels, and was working on developing balanced scorecards at teams and individual employee levels.

IV. CASE FINDINGS AND DISCUSSIONS

ALIGNMENT PROCESS: THE BIOCO WAY

As shown in Figure 2, the "BIOCO Way" is a top-down strategy-driven management process. Developed from the structure and the philosophy of balanced scorecard, it translates the corporate vision and strategy into divisional and departmental actions. In our interview with the CEO of BIOCO, we noted the CEO's strong conviction of strategy-focused, forward-looking management philosophy. He believes the success of a company starts with a clear vision of what the company wants to be and a competitive strategy to accomplish this vision. And he argues that what strengthens the "BIOCO Way" is the use of the balanced scorecard system as the tool for execution and feedback at every level. For example, the strategy map [Kaplan and Norton, 2000] translates the long-term strategy plan into an executable chart, guiding the creation of the corporate scorecard that is based on the short-term corporate execution plan. Note that the IT department's plan and scorecard lie at the bottom of this process, creating a sufficient condition for IT to align with business strategies and other department's operations. An example of the IT department strategy map is shown in Figure 3.

The "BIOCO Way" differs from, or enhances, a traditional organization strategic planning process in several ways.

1. The "BIOCO Way" is not just a strategic planning process, but is also an operation system. With its full integration with the balanced scorecard, the "BIOCO Way" emphasizes how the strategies and tactics formulated should be carried out and measured at all levels.

2. Although the "BIOCO Way" signifies a top-down, hierarchical planning *process*, its content, or what is being planned, is regularly reviewed and renewed from the bottom up. The balanced scorecard provides a platform for feedback to indicate whether the strategy execution is effective. Each year, managers at both the corporate and department levels conduct reviews of the performance and the appropriateness of their respective balanced scorecards of the prior year. Based on the results of the reviews and the short-term execution plan for the coming year, strategic initiatives are added or removed. Individual measurements and target values in the scorecards are adjusted accordingly.

3. The "BIOCO Way" received strong endorsement and sponsorship from the top management for its continuing viability. The CEO and the other corporate executives advocate the importance of the "BIOCO Way" as a corporate culture program. The CIO, considered one of the in-house gurus for the balanced scorecard by other business managers, became the custodian of the system. To make it easy to use, the IT department implemented and maintains an automated data collection and reporting system for input into the balanced scorecards at various levels of the company, accessible in real time by managers using secure web browser anywhere there is an Internet connection.

In our study, we observed that the "BIOCO Way" took root in the corporate culture and is routinized and institutionalized. For example, from the CEO to middle mangers, their statements about the vision, the strategy, the processes, and their responsibilities in overseeing the implementation of the strategies and processes have been quite consistent.

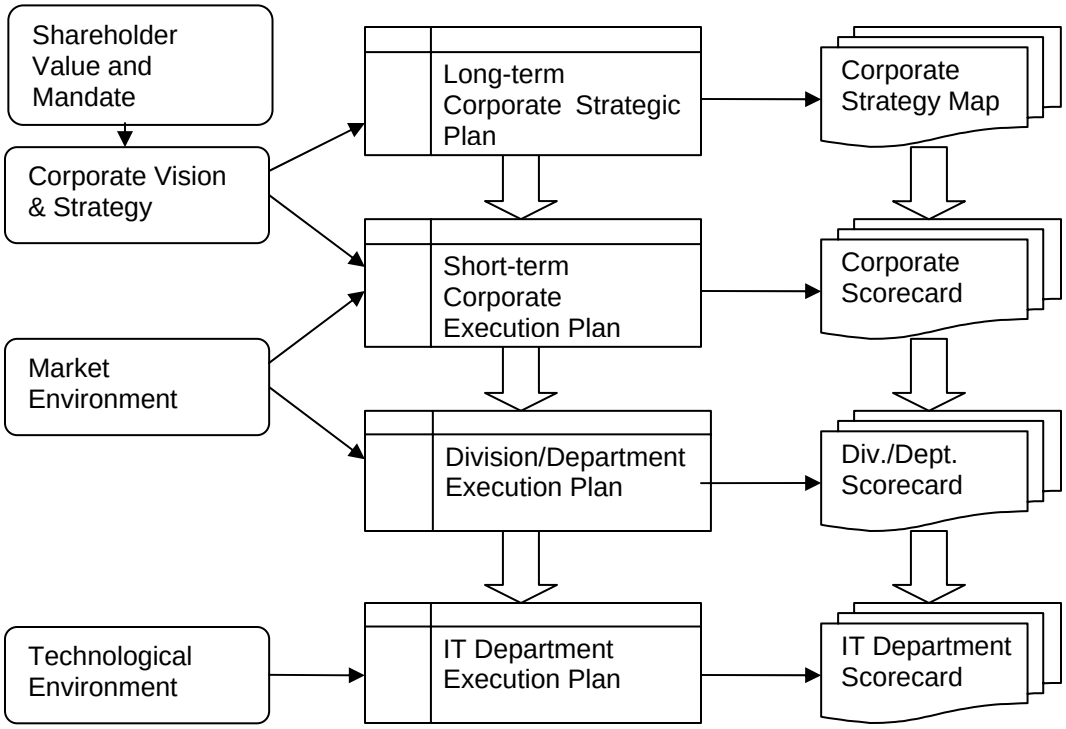

Figure 2. The Alignment Process at BIOCO: "The BIOCO Way"

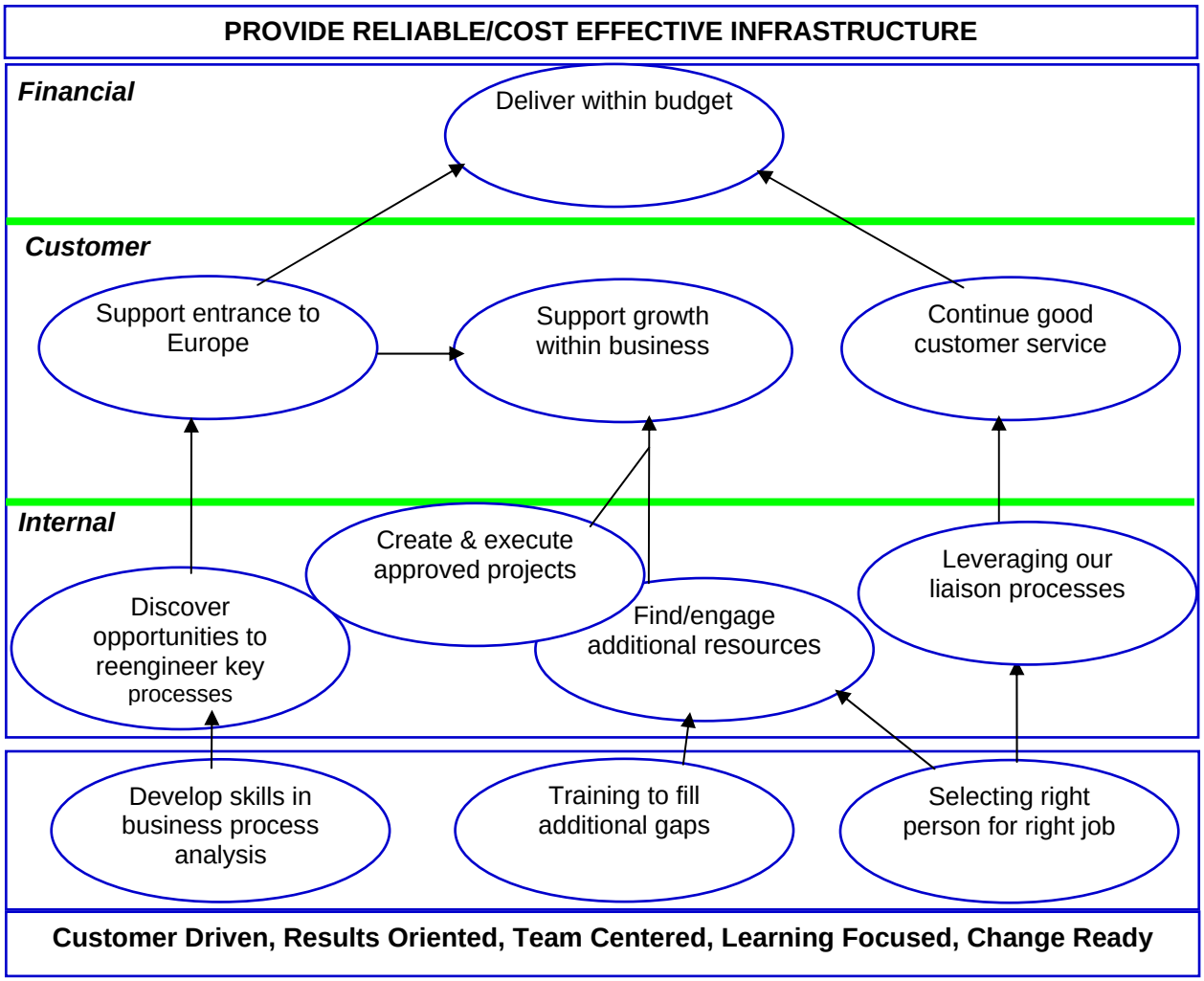

Figure 3. The Strategy Map of the IT Department

MAPPING THE REICH-BENBASAT MODEL

The Reich-Benbasat model (Figure 1) is defined as "the state in which business and IT executives understand and are committed to each other's plans and objectives" [Reich and Benbasat, 2000]. We used the model to examine if and how the "BIOCO Way" helps the company achieve IT-business alignment. According to the model, alignment is achieved through two current practices:

- communications between business and IT executives and
- connections between business and IT planning.

These two practices can thus be viewed as organizational drivers to alignment. Direct measurement of the level of strategic alignment achieved and maintained in an organization is undoubtedly difficult, if possible at all. However, indications of strategic alignment can be observed and measured, as suggested by Reich and Benbasat, using those two organizational drivers as surrogates for levels of alignment. The evidence strongly supports management claims and our assumption that BIOCO achieved a high level of alignment between business and IT.

Connections between IT and business planning processes appear to be strong at BIOCO. The "BIOCO Way" is the guiding management system. A formal, annual process exists for business planning, where the company examines the current and future business drivers, develops the long-term (ten-year) corporate strategic plan, and sets the company's milestones for the next year. Based on the strategic plan and the milestones, all functional areas submit their own operating plans to form the company's tactical plan for the coming year. IT, like all other departments and divisions, is part of the process. Its operating plan is developed based on the business objectives and ratified by the senior executives. The corporate strategy document clearly lays out the objectives of the IT department for the current year, and both the CIO and the senior manager of IT reiterated those objectives for their department in the interviews. The CIO, in particular, maintains that the role of IT to the overall success of the company should be "the enabler so the business can execute its business strategy." He meets with business and IT managers regularly to ensure that his department understands and practices the corporate business strategies and IT objectives. This connection is evident in BIOCO's long term strategic plan:

> *"The Information Technology strategy concentrates on enabling the enterprise with the necessary business information supported on a cost-effective technical infrastructure. Among the most significant elements of this strategy are achieving operational excellence through discovering opportunities to perform business processes more efficiently and supporting the business growth associated with our initiatives to bring high value products to market."*

It is echoed in the IT department strategic plan:

> *"The [BIOCO] business plan involves several transformational events with significant implications to the role of Information Technology. These events are numerous and involve the globalization of existing products […] and the launch of [BIOCO products]. This will require enabling technologies to succeed, some of which exist today requiring upgrades and some of which do not currently exist requiring investments of time and capital."*

This connection exists not just in corporate documents, but also in the executive management process:

> *"There is an annual strategic planning process, and out of that comes the business plan approved by the board of directors, and out of that come the corporate objectives, and out of that come the departmental scorecards."* VPIII.

The other organizational driver, communications between business and IT executives, also appears strong at BIOCO. Several formal communication channels are used. A liaison program puts IT and business managers in touch on a monthly basis. Temporary teams consisting of IT professionals and users are created functionally when necessary. A permanent "IT Steering Committee," composed of senior executives of the company, is responsible for prioritizing IT projects and investments across all business areas. In addition to the formal channels, IT personnel keep business managers aware of IT issues related to their functions informally and on a project-by-project basis. The CIO, in particular, communicates with other executives through formal executive-level meetings, strategic planning sessions, and frequent informal personal interactions with business managers. Other executives responded to the question of communication similarly:

> *"E-mail, voice mail, formal meetings, walking over to his office, him walking over to my office. I don't know what else is there to do with that, but we use them all."* VP III.

ANTECEDENTS

Two antecedents characterize the Reich-Benbasat alignment model: shared domain knowledge and a successful IT history. We found strong evidence that these two factors indeed played significant roles in driving the alignment at BIOCO.

Shared Domain Knowledge. The model claims that the level of shared domain knowledge positively influences both the communications between business and IT managers and the connections between business and IT planning. Luftman and Brier [1999] show that "IT understands business" and "IT does not understand business" are among the top four strategic alignment enablers and inhibitors, respectively. And the CIO's business knowledge is identified as an important factor in the organization's IT assimilation [1999]. At BIOCO, the IT department knows the business well. Both the CIO and the senior manager of IT were in the biopharmaceutical industry for many years, and this fact is well known by other executives.

> *"I've known [IT managers] forever, and we've got [name omitted] there that's been with the company for a long time… So that structure and the senior management within IT [are] very much experienced at [BIOCO]. They've grown up with us."* VP I

The CIO is very much involved in management issues and with extensive exposure to strategic management literature. As a result, he is considered one of the balanced scorecard gurus in the company. He spearheaded its implementation and on-going refinement. This status not only gives him the credibility with business mangers but also the first-hand knowledge of the business strategies and operational needs of departments and divisions of the company.

Shared domain knowledge, including IT knowledge shared by business managers, enhances IT and business communications. Luftman [2000] finds that understanding IT by business people and knowledge sharing are among the attributes for strategic alignment maturity. Shared knowledge is also important for IT performance [Nelson and Cooprider, 1996]. We find that the business executives at BIOCO appear to know the IT side well. The CEO, in particular, holds an MBA with MIS concentration. Other business executives extend their knowledge of IT mainly in two ways. They read articles about IT applications in their own functional areas and, probably more important, they have all led or participated in IT projects for their departments.

> *"I was part of a design-and-development team for that particular system. I was involved in the design and development of a previous system that we had many, many years ago that involved our laboratory testing as well. I was very much part of the SAP adoption."* VP I

Successful IT History. A successful IT track record tends to improve IT's relationships with business at all levels [Rockart et al., 1996]. It is argued that the record of IT implementation success can enhance the communications between business and IT executives and the connections between business and IT planning processes [Reich and Benbasat, 2000].

In evaluating his department's performance, the CIO at BIOCO spoke of different types of IT initiatives: Some were expansive projects aiming at growing new businesses, while others focused on cost savings and containment. In general, the CIO felt that the IT initiatives were handled well. We find that BIOCO's business executives we have interviewed largely agree with the CIO's assessment. Overall, they expressed a high level of confidence in their IT division to do the right thing. They also expressed satisfaction with some of the major IT projects, such as the ERP implementation, they were involved with. Further, in cases where issues and problems inevitably developed, these business executives showed a great degree of understanding and still give IT high marks for accomplishing their objectives after bumps and bruises. When asked of his personal feel of how successful IT was in the past, VP II stated:

> *"I think they're successful…I know we're all human and we all make mistakes. We strive for excellence; there are always hiccups along the way because of the*

> *nature of us. But I'm very satisfied with what our IT group has been able to accomplish with the resources that they've had to work with over the past several years."*

This high level of understanding when things go wrong leads us to believe that some other factor(s) is at works for this perception of successful IT history to develop. Based on previous research and pre-test of concept with the CIO, we focus on the relationship management aspect of the IT-business alignment.

RELATIONSHIP MANAGEMENT

The literature shows that relationships between business and IT managers are an important factor for IT success in an organization [Feeny et al., 1992; Jones et al., 1995]. The CIOs' formal and informal interactions with top management team members, for instance, can positively influence the IT assimilation in firms [Armstrong and Sambamurthy, 1999]. Similarly, Chan [2002] finds that business executives repeatedly downplayed the value of formal organizational structure, but frequently emphasized the critical role of relationships in achieving strategic alignment. Further, a longitudinal study by Luftman and Brier [1999] shows that while a close relationship between IT and non-IT functions was the fourth among the fifteen identified alignment enablers, the lack of a close relationship ranked first of the fourteen alignment inhibitors.

IT managers at BIOCO pay much attention to relationship with other departments. The CIO thinks that relationship management is one of the most important tasks of IT management. His thinking is reflected in his IT department: the IT Manager stated that it is very important to invest time and effort in managing relationship with other departments. The importance of IT-business relationship is shared by non-IT executives.

While relationship (or the "informal structure," as Chan [2002] puts it) is recognized as an IT asset [Ross et al., 1996] and an important component in alignment, it remains a soft, intangible factor that is difficult to operationalize. The CIO at BIOCO established systematic means to manage relationships actively. One way for IT to build relationship with other parts of the business is to understand their objectives and operations [Boynton et al., 1994; Reich and Benbasat, 1996]. For that, the BIOCO IT department assigned liaisons with each of the business areas. With the dedication to specific business functions and regular communications with users in those departments, the IT liaisons play an important role in fostering a good relationship between IT and the departments. Beyond the liaison program, IT managers are encouraged to stay in touch with other departments to keep up with the current operational needs. Customer measures are built into the IT department's and employees' scorecards, motivating them to manage the satisfaction of users actively.

> *"So now all of us managers within IT have liaisons within the business community. Several times throughout the year we make sure that we stay in touch with [other departments]; and at the budget time, we have meetings that are more informal to review their requirements… [I]f we don't have a good partnership with them, then we'll fail. So it's really extremely critical. Until you learn that, your IT is not successful."* The IT manager

> *"[W]e have a very close relationship and have identified key people within my group and key people within IT that have … every-other-week or monthly meetings on [our IT systems]."* VP I

Research finds those CIOs who look beyond IT area or contribute beyond the IT function maintain better relationships with their CEOs than those who don't [Feeny et al., 1992; Jones et al., 1995]. These findings suggest that the perception that the IT department is part of the mainstream business instead of just a technology group can help enhance the relationship between IT and business. This is the case at BIOCO. For example, as discussed earlier, BIOCO's CIO leads the implementation of the corporate balanced scorecard. All three VPs we interviewed cited that activity as an example that IT steps outside the traditional technology

boundary. As a result, other departments feel comfortable talking to IT and the CIO whenever there is an IT concern, or when they just seek general advice from IT to enhance their own work.

> *"On an informal basis, I guess I make it a point to get down to the IT area … multiple times a week, because I always have needs, in particular, relative to the website, or I'll get help on jazzing up a presentation or something like that. So on ad-hoc basis, it's probably several times a week."* VP II

The effect of active relationship management on alignment, as we found at BIOCO, is threefold.

- Relationship management contributes to the communication between IT and business. Although the causality between relationship and communication is not clear, active relationship management programs such as liaisons result in better overall communication (and relationship) between IT and other departments.
- Relationship building enhances the understanding of each other's operations, thus increasing the shared domain knowledge.
- Active relationship management fosters the perception that the IT department is successful and to mitigate the influence of past IT failures.

These findings lead to our first proposition that extends the Reich-Benbasat alignment model:

> *Proposition 1: Active relationship management by IT managers contributes to IT-business alignment through enhanced communication between business and IT managers and positive influence on the shared domain knowledge and perception of successful IT history.*

THE ROLE OF THE BALANCED SCORECARD

The balanced scorecard is the foundation and structure of the "BIOCO Way." Our data show that its implementation impacted the company greatly. The CIO feels that the balanced scorecard helps the departments look beyond their own operations, and VP II thinks that it helps communicate the company's goals and strategies, thus mobilizing everyone in the company:

> *"I think it has been paramount and critical to … mobilize our company and get us moving. …[E]verybody is moving in more or less the right direction, and that's why we've seen some of the success that we've seen in our company, particularly in the past year. It doesn't happen on day one, okay. It takes about a year or so to start. [...] We're into our second ... year, and maybe it's even our third year, and we're really starting to see it having an effect now. A very clear roadmap."* VP II

In addition, all informants believe that the use of the balanced scorecard contributed significantly to the overall success of the company. The scorecard:

- clarifies and communicates the corporate strategies,
- prioritizes competing projects, and
- sets up tangible goals for every department and employee that are clearly linked to the overall goals of the company.

Our data indicate that the balanced scorecard plays an important role in the IT-business alignment at BIOCO. For the connections between IT and business planning processes, the CIO described a typical planning session where the corporate balanced scorecard sets up the basic corporate planning framework. Then every business division's plans, including its IT plan, fit into the overall puzzle. In such a planning session, exchanges such as "Okay, IT, I need you to give

me a […] project" unequivocally demonstrate the connection between IT and business planning processes under the balanced scorecard mechanism. When IT develops its own scorecard, the measures must be based on the corporate scorecard, which, in turn, reflects the corporate strategy.

> *"[T]he corporate scorecard … drives where we as a company are trying to go. All of the functional area scorecards are supposed to play into the corporate scorecard to support that corporate scorecard so that everybody is hopefully moving in the right direction. I can't comment on the specifics of the IT scorecard, but just knowing how we run the business, I am confident that their scorecard will be lining up with the corporate scorecard."* VP II

By linking back to the corporate strategy, IT can align its cost structure, service levels, and capital investments according to what is paramount to the business at a particular time. The IT scorecard is adjusted on an annual basis based on the current year's business goals and feedback from other departments. This process provides a formal mechanism to align IT and business strategies at BIOCO.

The balanced scorecard's impact on the communications dimension of alignment appears equally strong. It plays a dual role in enhancing communications. First, the balanced scorecard "provides a focal point and common language around the key value drivers of the organization" (CIO). Based on corporate strategies and IT's capabilities, the measures in the balanced scorecard become a communication platform for IT and business managers to discuss if and how IT is making contribution to the company's business, thus avoiding the "crosstalk" often arisen from IT and the rest of the business using their own jargon. The balanced scorecard also helps IT understand other business areas. Thus IT is able to serve the internal customers better. The IT manager stated that "[w]hat [the balanced scorecard] allows is for us to easily acknowledge the business objectives [of other division]..." This "common language" enables the IT department to look beyond their own operation.:

> *"Each functional area can become somewhat narrowly focused on their own business results. The [balanced scorecard] helps to highlight the key business priorities, many of which measure success across functional areas. When a problem emerges in a key area, the entire management team is alerted during the monthly business review. Action plans are discussed and accountability is shared the following month if the results have not been corrected."* CIO

And VP I agrees:

> *"I think they understand more [of the business objectives and strategies] because of the balanced scorecard. Not understand more what they have to do, but more understand how they prioritize. I believe it has to be across the board."*

In a more subtle way, the balanced scorecard also allowed the IT department to communicate its issues and limitations better with the business. The IT department updates its balanced scorecard and publishes the performance results regularly. As a result, users of IT see what IT did and are kept aware of the IT issues. Even more important, it sets the users' expectation for IT. During BIOCO's transformation, because funds were redirected to research and development, IT suffered significant budget cuts. By way of balanced scorecard, IT was able to inform users what could be afforded with limited budgets, effectively lowering the expectations for the IT department. Instead of condemning the service erosion, the general sentiment in the company was that IT had done a masterful job in maintaining a satisfactory service level within the resources constraints.

These findings lead to our second proposition that extends the Reich-Benbasat alignment model:

> *Proposition 2: Implemented as a strategic management tool, the balanced scorecard contributes positively to the communication between business and IT*

manages and the connections between business and IT planning, thus facilitating the achievement and sustaining of alignment.

Based on our findings at BIOCO, we propose the modifications to the original Reich-Benbasat model presented in Figure 4.

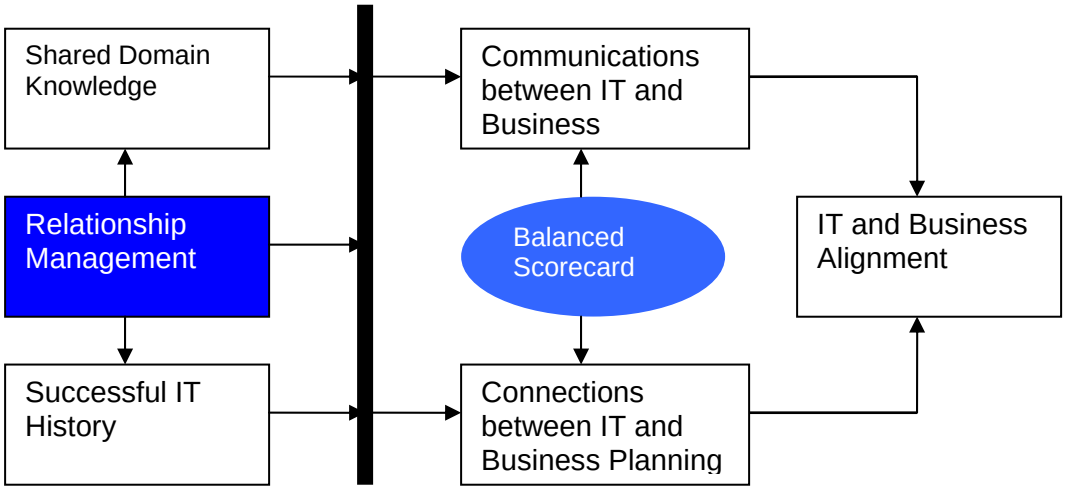

Figure 4. The Modified Alignment Model

V. CONCLUSIONS AND LIMITATIONS

CONCLUSIONS

In this study, we show how a mid-sized biopharmaceutical company uses the balanced scorecard as a mechanism, coupled with informal organizational structures to achieve strategic alignment between business and IT. In summary, our study contributes to the literature of business-IT alignment in the following ways:

1. We identified and described the "BIOCO Way," an integrated planning and execution system that affords the sufficient conditions for creating, nurturing, and sustaining IT and business alignment. This system, implemented successfully by BIOCO, provides a practical blueprint for managers in other organizations to create their own alignment schemes.

2. This research is one of the few, perhaps the only academic study that examines *how* strategic alignment through a practical management system is being implemented in practice.

3. We augmented the Reich and Benbasat [2000] alignment model with a theoretical construct, relationship management, and a practical tool, the balanced scorecard. We find that active relationship management enhances the communication between IT and other business departments, shared domain knowledge, and the perception of a successful IT department. We find that the balanced scorecard contributed to the alignment of IT and business strategies by acting as a platform for the communications between IT and business managers, and by strengthening the connections between IT and business planning processes.

Our findings and the modified alignment model are consistent with the factors identified in other recent alignment studies. In a survey of over 300 CIOs and IT managers, Luftman and McLean [2004] identified the top five enablers of IT alignment as IT understanding of the firm's business environment, close partnership between IT and business, senior executive support for IT, linking IT and business plans, and IT demonstrating strong leadership. Our case evidence shows that BIOCO is superior in all the five enablers. These five enablers are similar to the drivers identified in the alignment model, with the exception of the senior executive support, which is nevertheless

implicit in the model. Under the leadership of the CEO and the CIO, the company created and seamlessly integrated the "hardware" of alignment (the BIOCO Way) and the "software" of alignment (the institutionalization and the culture), ensuring a sustained process of alignment rather than a cycle of alignment-misalignment often observed in other organizations.

LIMITATIONS

Although the single case study is an appropriate methodology for this research project, it is subject to inherent constraints and limitations [Yin, 2003], such as being based on a limited data set. BIOCO is medium-sized company, and its alignment characteristics may be different from those of large firms. These factors could affect the generalizability of the study. Although we do not believe that the alignment mechanism is particular to the case company or its industry, the analysis of alignment presented in this study may be limited to BIOCO's type of business environment, where the main function of IT is to "provide actionable information and enable business processes" (CEO of BIOCO). This characteristics of the IT function is clearly demonstrated in the "BIOCO Way," where IT strategy and balanced scored is at the bottom of the hierarchy of the planning and execution processes. It is reasonable to assume that an effective alignment system could be different in the business environment where IT drives business strategies. To complement this study, future research could focus on companies that fall into this category.

Another important limitation is the qualitative nature of this study. In collecting data, we relied mainly on the text of company documents and the perception of the managers based on their statements. An alternative or complementary approach would be to use objective and quantitative measures to assess the strengths of the relationships depicted in the alignment model and the level of alignment of the case company. For example, the strategic alignment maturity model of Luftman [2000, 2003] provides a comprehensive assessment tool based on six maturity categories (communications, competency/value measurement, governance, partnership, technology scope, and skills) that can be used to measure the level of alignment maturity in an organization.

DIRECTIONS FOR RESEARCH

In addition to the improvement in measurement, Luftman's model implies an extension for future research. We believe that the combination of a top-down, strategy-driven methodology such as the balanced scorecard and a bottom-up prescriptive tool such as Luftman's maturity model could result in a more capable integrated IT-business alignment system than either one alone. The detailed indicators in the maturity model could be used to create effective alignment measures to be included in the balanced scorecard. And at the same time, the strategic focus of the balance scorecard could provide the company-specific strategy guidance for the maturity assessment tool. We believe that the integration of these two methodologies would provide a powerful approach to IT-business alignment. The effectiveness of such system remains to be investigated.

For future academic research, this study generated several major research questions. One is the role of CIO in the alignment process. A rich research stream focusing on IT leadership offers an understanding of how a CIO adds value to a firm and how he or she maintains relationship with the CEO and the top management team [Boynton et al., 1994; Feeny et al., 1992; Jones et al., 1995; Rockart et al., 1996]. But at BIOCO, we identified a unique role of the CIO. In addition to his IT responsibilities (strategic and tactic), the CIO spearheaded the implementation of the balanced scorecard in the whole organization, on behalf of the CEO, and mobilized the IT resources to support this management system and its continued refinement. We found that the CIO being both the champion and the caretaker of the balanced scorecard resulted in a strong positive impact on the organizational acceptance of the scorecard at BIOCO. Whether this is a newly expected role of the CIO or a unique case, however, cannot be determined through this single case study. Further broad-based study is warranted to examine the role of the CIO in implementing the balanced scorecard and in achieving IT-business alignment.

In the modified alignment model shown in Figure 4, the balanced scorecard is shown, based on the BIOCO case, as the central system to achieve alignment. However, the scorecard cannot be regarded as the only possible candidate. It may be possible to substitute other proper management systems for enhancing and coordinating the two alignment drivers, communication between IT and business and connections between IT and business planning. For example, one candidate is the portfolio management of IT [Benko and McFarlan, 2003; Weil and Aral, 2004]. However, many such schemes, although powerful in the joint planning aspect of alignment, are weak as a communication platform; the balanced scorecard is the only one we found that enhances both drivers. Future research on alignment may discover other strategic management systems appropriate for the task.

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APPENDIX. THE BALANCED SCORECARD

Kaplan and Norton [1992] first presented the concept of a balanced scorecard system for measuring firm performance from a holistic perspective. A series of their articles thereafter further enhanced its concepts and applications, gradually transforming it from a performance measurement tool to a strategic management system [Kaplan and Norton, 1993, 1996a, 1996b, 2001a, 2001b]. They argued that traditional financial accounting measures such as return on investment only can give limited or even misleading signals for competitive business activities, because they are the lagging indicators to business health. Instead, the balanced scorecard

depicts and measures a firm's current operating performance, as well as the drivers of future performance, by tracking and measuring four dimensions of business: financial, customer, internal process, and innovation and learning (Figure A).

From the shareholder perspective, financial measures indicate whether and how the firm's strategies and operations are contributing to business improvement. Commonly used financial measures include revenues growth and mix (growth indicator), return on investment, operating income, gross margin (prosperity indicators), cash flow (survival indicator), and so on.

From the customer perspective, the balanced scorecard helps managers translate their concept of customer service, satisfaction, and value into specific measures that reflect the factors that really matter to customers. The appropriate measures stem from customer's usual concerns, such as time, quality, service, and cost.

In order to deliver on the value propositions of customers and to satisfy shareholder expectations, managers need to identify those critical internal processes in which the firm must excel. The internal business process measures for the balanced scorecard are derived from the business processes that have the greatest impact on customer satisfaction and financial performance, such as cycle time, quality, and productivity.

Lastly, the balanced scorecard uses the innovation and learning perspective to address the drivers of future business. The ever-changing market, technology, and competitive landscape mean that a firm must build an infrastructure for long-term growth and improvement and track its ability to innovate and learn. Commonly used measures for learning and innovation would include patent productivity, rate of new product development, strategic personnel availability, and so on.

Since its inception, the balanced scorecard has been widely adopted by firms and claimed an

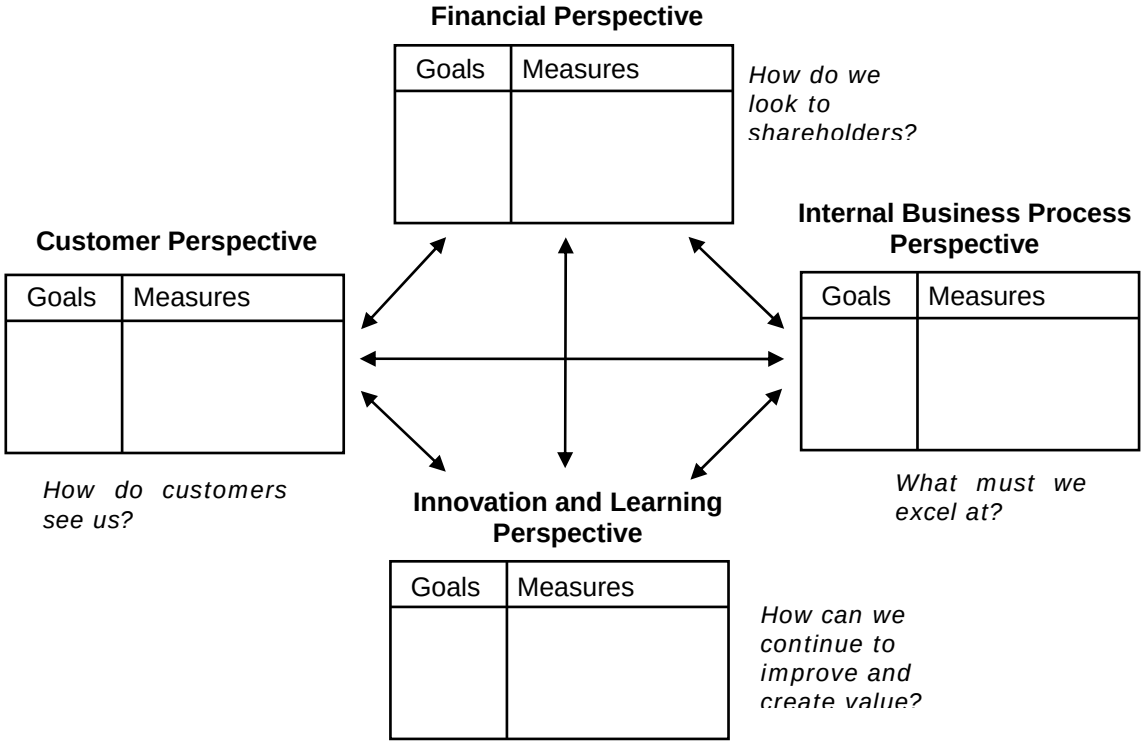

Figure A. The Balanced Scorecard (adopted from [Kaplan and Norton,1992])

important role as a performance management tool for business [Sim and Koh, 2001; Hepworth, 1998; Kaplan and Norton, 1996b]. In addition to the application of the balanced scorecard to the organization as a whole, attempts were also made to revise the balanced scorecard to the task of performance measurement in more narrowly defined corporate functions such as IT department [Martinsons, 1999; Grembergen and Saul, 2001], IT and business integration [Van Der Zee and De Jong, 1999], web services integration [Huang and Hu, 2004], project management [Eickelmann, 2001], electronic commerce [Hasan and Tibbits, 2000], and quality management [Solano et al., 2003].

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