HOW TO MEASURE AND IMPROVE THE VALUE OF IT

A BALANCED SCORECARD GEARED TOWARD INFORMATION TECHNOLOGY ISSUES CAN HELP YOU START THE PROCESS.

BY MARC J. EPSTEIN AND ADRIANA REJC

Senior corporate and financial managers have often been frustrated when submitting budget requests for new information technology projects. Though the executives would complete standard return on investment (ROI) calculations and rigorous financial analyses, numerous IT projects were started without the rigor of measuring either costs or benefits. Decisions were based on compelling arguments or to keep up with competitors, which resulted in billions of dollars of wasted corporate assets.

Typically, the costs of the technology and the conversion to a new system are much higher than anticipated, whereas the benefits are far lower and harder to achieve than expected. There also are significant additional costs related to internal employee time wasted and the disruption to personnel, operations, and the revenue stream of the organization. But it isn't only growing costs that make IT an important expenditure. The consequences of improper and ineffective IT initiatives can be significant if you consider the integration of the IT department into the mainstream functions of your organization. Though the claim that some organizations have collapsed because of ineffective IT policies may be an exaggeration, many CEOs and business unit leaders view IT as a value destroyer or a cost rather than a value creator, implying it has a corroding impact on the organization's competitive advantage.

DEMONSTRATING THE VALUE OF IT INVESTMENTS

A primary reason for doubts about the potential value organizations can derive from existing and future IT investments is related to the absence of a proper way to measure IT's value-creating role and evaluate the payoffs of IT investments. Historically, organizations have been driven by enthusiastic managers who were relying too much on technology and who didn't demand that their employees develop the needed skills and measures to complete these analyses. Today, financial managers and other decision makers want IT budget requests to be framed in an ROI or shareholder-value format so they can be compared effectively with other potential company investments.

Senior IT managers are convinced that their department creates value and believe that, if its activities were measured properly and if they had adequate support, IT would be a significant profit center for their organization. But without adequate performance evaluation systems, they have a hard time proving the value-adding role of IT and find themselves continually fighting for and justifying the resources they need. CEOs and CFOs lack objective data on which to make well-informed decisions about the payoffs of these investments, so corporate goals seem to focus on reducing IT costs rather than maximizing IT value-creating activities.

IT executives faced with the challenge of demonstrating the value of IT initiatives to the business, IT managers, and financial managers must work together to measure and communicate information technology's contribution so that viable existing initiatives are man-

aged appropriately, new projects are approved only where there is satisfactory return, and marginal or ineffective projects are revised or eliminated. Improved rigor in this area can lead to more projects being approved that create corporate value and increase corporate profitability.

Top executives are convinced and moved by measurable results. When a new project is proposed, additional funding is typically based solely on the results anticipated from the project. To properly assess the payoffs of IT investments, organizations must implement comprehensive systems to evaluate the impact of these initiatives on financial performance and the trade-offs that ultimately must be made when there are competing organizational constraints and numerous barriers to implementation.

But how can they do this?

A BALANCED SCORECARD CAN HELP

An IT performance measurement and management system must focus on the causal relationships and linkages within the organization and the actions managers can take to improve both customer and corporate profitability and drive increased value. To do this, a company should determine the key drivers of IT success and the causal relationships among them and develop numerous performance measures to track IT performance. We believe an IT balanced scorecard can help. We have created such a scorecard along with a broad list of measures for evaluating performance in information technology to help CIOs justify and evaluate their initiatives and aid CEOs and CFOs in making better resource allocation decisions.

Robert S. Kaplan and David P. Norton developed the balanced scorecard as an approach to performance mea-

surement that combined traditional financial measures with nonfinancial ones to provide managers with richer and more relevant information about activities they manage. Later it became a strategic management system to articulate, execute, and monitor strategy using four perspectives: financial, customer, internal business process, and learning and growth related measures. The balanced scorecard brings together, in a single management report, many of the seemingly disparate elements of an organization's competitive agenda. Since the concept was introduced in 1992, balanced scorecards have been implemented at corporate, strategic business unit, shared service functions, and even individual levels.

Further analyses of the relationships between the causes and effects of various managerial actions have also been developed to specify the relationships and measures that lead to superior performance. Strategy maps and action-profit linkages articulate the causal relationships. When used in a balanced scorecard, these chains of cause and effect that link across the learning and growth, internal processes, and customer perspectives to financial results for shareholders are given visual form. (For more information on strategy maps, see Kaplan and Norton's *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*, published by the Harvard Business School Press in 2004. For more about action-profit links, see the article by Marc Epstein and Robert Westbrook, "Linking Actions to Profits in Strategic Decision Making," in the Spring 2001 issue of *MIT Sloan Management Review.*)

Objectives and Drivers of IT Success

Our IT balanced scorecard follows the original framework developed by Kaplan and Norton in that it includes the four perspectives: the learning and growth perspective, internal processes perspective, and customer perspective, which are antecedents of the financial perspective. An organization's IT success is dependent on various IT learning and growth related elements, such as appropriate resources (capital and people), suitable corporate systems (training, information, performance measurement and incentive systems, organizational culture and climate), and behavioral effects. IT learning and growth affects IT internal processes, such as standardization; integration and consolidation; security; and overall quality of IT processes, products, and services. Both the IT learning and growth and internal processes impact customer satisfaction. Because both internal and external customers play a critical role in the IT function, we divided the customer perspective into internal and external

customers. Internal customers' satisfaction reflects in their increased productivity, creativity, and quality of work. External customers' satisfaction, on the other hand, will reflect in higher loyalty, new customer acquisitions, and greater sales. From the financial perspective, both customer dimensions lead to either higher revenue growth or cost reduction.

An organization then needs to determine the specific objectives for each of the four perspectives that relate to its IT strategy and that are also aligned with the overall business strategy. After identifying specific IT objectives along all four perspectives, a company must determine the drivers of IT success. Critical drivers more precisely specify the keys to success and the actions managers must take to improve the success of the IT activities that will ultimately impact overall organizational success. A careful and clear articulation of the most influential drivers of IT success helps managers understand the causal relationships leading from the learning and growth perspective to the internal processes and then flowing to the desired customer outputs and financial results. Causal relationships among drivers within each of the four dimensions as well as among drivers in different dimensions are based on hypothetical assumptions of causes and effects, i.e., leading and lagging elements. As such, they need to be continuously tested and revised.

In Figure 1 we show an example of the causal relationships among various drivers of success in an IT balanced scorecard. It shows that, for example, if organizations document and measure IT processes in terms of resources allocated and results achieved, they will have the necessary data to argue for additional resources to be invested in IT technology, skills, and knowledge. As more financial resources are available for the department, organizations can introduce new IT products and services that will lead to acquiring new customers, satisfying the existing ones, and, consequently, increasing sales and profits. Alternatively, improved measurement and documentation allow companies to specify suitable and fair incentive systems that improve both the IT professionals' stability index and the quality of IT services. This will, in turn, lead to improved IT processes and finally to reduced costs.

This illustration of IT performance drivers serves exclusively as a template for you and your company to customize as appropriate. In practice, however, there should be fewer critical IT performance drivers, and the illustration of the causality of IT performance drivers should be less complex. All in all, all four perspectives
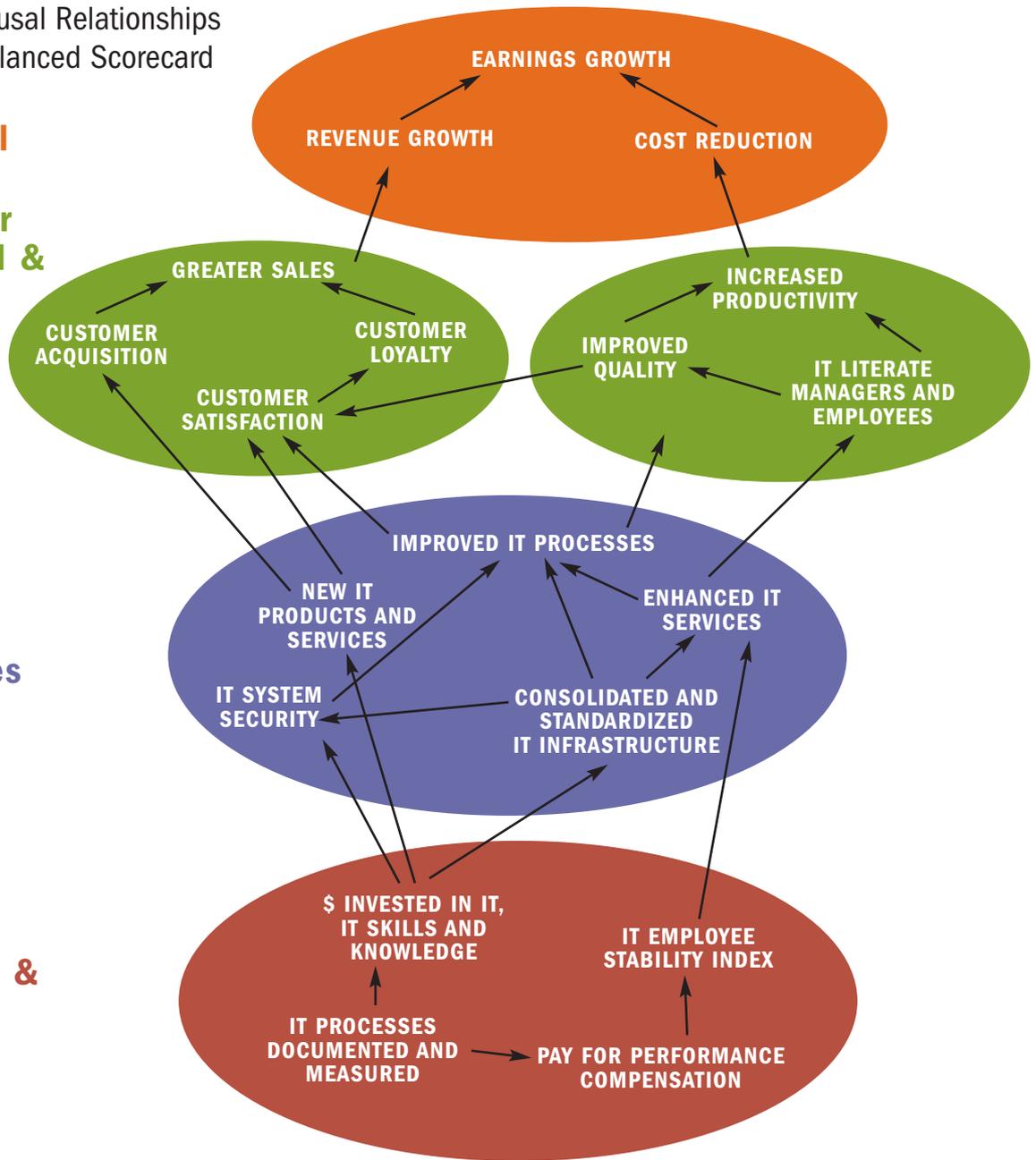
Figure 1: Causal Relationships
in the IT Balanced Scorecard

Financial

**Customer
(external &
internal)**

**Internal
Processes**

**Learning &
Growth**

EARNINGS GROWTH

REVENUE GROWTH

COST REDUCTION

GREATER SALES

CUSTOMER
ACQUISITION

CUSTOMER
LOYALTY

CUSTOMER
SATISFACTION

INCREASED
PRODUCTIVITY

IMPROVED
QUALITY

IT LITERATE
MANAGERS AND
EMPLOYEES

IMPROVED IT PROCESSES

NEW IT
PRODUCTS AND
SERVICES

ENHANCED IT
SERVICES

IT SYSTEM
SECURITY

CONSOLIDATED AND
STANDARDIZED
IT INFRASTRUCTURE

$ INVESTED IN IT,
IT SKILLS AND
KNOWLEDGE

IT EMPLOYEE
STABILITY INDEX

IT PROCESSES
DOCUMENTED AND
MEASURED

PAY FOR PERFORMANCE
COMPENSATION

connect in a chain of cause and effect: IT learning and growth improve internal business processes, and internal business processes improve customer satisfaction, both internal and external, which in turn leads to improved financial performance. Thus, this is a continuum where one category of drivers and measures drives performance in the next. These drivers and subsequent measures should reinforce each other so that all contribute to increased corporate financial performance. The financial perspective relating to the outcomes of the IT initiatives helps managers keep score in the traditional sense.

Many of the performance measures included in this

perspective, such as overall cost reduction and revenue growth, will be the same from organization to organization. Proceeding further down the causal linkage model, drivers may differ greatly but should always clearly express the logic of if/then hypotheses. Examples from Intel and Pirelli could be easily transformed into IT balanced scorecard templates. In Intel, for example, employees who were upgraded to wireless notebook computers realized a productivity gain that exceeded the cost of the upgrades in the first year. Wireless mobility also changed the way employees worked, letting them make productive use of formerly wasted slices of time between larger tasks

so they could redistribute their working time around professional and personal obligations. Pirelli, a manufacturer of automobile tires, cables, and systems, integrated its IT systems with those of its global customers and dealers and was able to significantly reduce administrative activities, save time, and reduce costs.

Developing Appropriate Metrics

To closely monitor these cause-and-effect relationships, an organization must develop appropriate metrics. Table 1 provides IT objectives and a list of metrics for our IT balanced scorecard along the four perspectives. It demonstrates how identifying the drivers and measures of the payoff of investments in information technology can be applied by organizations that commonly use balanced scorecards. The metrics can be used to justify an IT project before it is started (planning) as well as to evaluate it when it has been completed (performance measurement).

There is no precise rule for the right number of metrics to use in measurement systems, but including too many tends to distract managers from pursuing focused IT initiatives. A system that's overly complex leads to bureaucracy and confusion. Because of recent developments in technology, IT systems are now able to provide a plethora of statistics, but, without careful analysis, this can lead to an overload of data with little meaningful information. For this reason, it's important to focus on key indicators rather than introducing indicators for everything that can be measured. Generally, a complete IT performance measurement system should include no more than 20 measures.

MONITORING IS KEY

The implementation of an IT balanced scorecard shouldn't be seen as a threat to or imposition on staff but as a mechanism to enhance performance and corporate learning. A properly developed and implemented measurement system promotes productivity by focusing attention on the most important issues, tasks, and objectives of the organization.

Yet performance measurement systems have to be modified as circumstances change, just like strategic objectives are modified according to the new strategy, drivers are revised, and new causal linkages among drivers are determined. Performance measures should be adapted so that they remain relevant and continue to reflect the issues that are important to the business. All too often, organizations implement new measures to reflect new priorities but fail to discard measures reflecting old priorities, which results in uncorrelated and inconsistent measures. Ideally, organizations should implement systematic processes for managing the evolution of their measurement systems.

Performance measurement systems should also be dynamic so that performance measures that can be manipulated more easily or that lead to deviations from the planned results are replaced. For instance, a company implementing a new enterprise resource planning (ERP) system might set an on-time target improvement of 15%. This would encourage prompt shipments but might possibly lead to more erroneous shipments, which aren't measured. Instead of implementing just one performance measure, number of on-time shipments, additional performance measures, such as percentage of reliable shipments, should be introduced to prevent potential damage. Similarly, the organization trying to justify the new ERP system may aim at achieving a 20% reduction in inventory carrying costs, but this also might cause a sharp increase in the number of short shipments, which simultaneously increases delivery costs. Such behavior may be because performance measurement itself serves as a powerful motivation mechanism. Performance measurement systems must be carefully designed to align corporate values and strategy with multidimensional balanced performance measures and suitable incentives. Otherwise, incentive pressures and inappropriate performance measures may lead to dysfunctional behavior, such as we just described.

Sometimes only the annual targets and reward systems

Table 1: Objectives and Metrics for the IT Balanced Scorecard

OBJECTIVES	MEASURES/METRICS
FINANCIAL	
Long-Term Corporate Profitability/ Organizational Success	% change in stock price attributable to IT initiatives
	EVA
	Earnings growth
Short-Term Corporate Profitability/ Organizational Success	Revenue growth
	% in overall cost reduction
CUSTOMERS (EXTERNAL)	
Value Capture	Average customer profitability
	Profitability of IT projects
Customer Loyalty	Customer satisfaction with IT activities
	% of customer attrition
	Ratio of new visitors to repeat visitors
	Frequency of customer return visits to the website
Customer Acquisition	Number of new customers gained through IT innovation
	% of visitors to website who are also buyers (reach)
	Number of created customer partnerships
CUSTOMERS (INTERNAL)	
Improved Quality	$ saved on less rework
	% reduction of customer grievances
	$ saved on improved costs of quality
Increased Productivity	% increase in customer orders processed
	% increase in production output per employee
INTERNAL PROCESSES	
IT Processes, Products and Services	Number of new IT products and services introduced
	Average time required to respond to customer service requests made through IT
	Hours of website downtime (in a year)
Chargeback on Actual Resource Usage	% of IT costs allocated back to business units or functions
Increased Security	% of unplanned information system downtime
Consolidated, Standardized, and Streamlined IT Infrastructure	Number of IT applications that aren't fully integrated within the overall system
	% of standardized hardware, databases, communications, and applications systems
LEARNING & GROWTH	
Performance Measurement	% of project evaluations based on ROI metrics
	% of IT staff with "pay for performance" compensation
	% of IT processes documented and measured
Development of IT Skills and Knowledge	$ invested in IT skills and knowledge
	IT employee stability index
	Number of IT professionals per employee

that tie compensation to performance have to be changed to ensure proper functioning of the performance measurement system. The problem of setting targets is largely related to the lack of standards for judging the success of IT investments. Although most IT executives generally know when a measure represents an acceptable performance, few have attempted to develop measures, standards, and indices. This obstacle can be minimized as more organizations adopt measurement and evaluation frameworks and metrics and report their results publicly or through benchmarking projects. Also, compensation systems and performance measures used to reward the performance of IT managers and their staffs must be selected carefully. If the evaluation includes elements other than those they directly control, the reward system will often cause frustration and demotivate employees rather than encourage better performance.

IMPROVING PERFORMANCE

With CEOs and CFOs demanding accountability for the tremendous investment in information technology, IT managers are required to ensure accountability, calculate the return on investment, develop a value-added approach, and make a positive bottom-line contribution. But they usually need help. Financial managers must provide guidance and a model, such as the balanced scorecard, for identifying and measuring the drivers of success regarding IT investments. Only then can the IT function's performance be improved and the department can maximize its contribution to corporate value. The model also provides the information needed to analyze the value that will be created by each potential investment.

Our balanced scorecard attempts to provide a format organizations can use to identify and measure the costs and benefits of information technology. With this approach, managers can implement a performance measurement system that better evaluates the effectiveness of IT investments and that can lead to dramatic improvements in decision making, corporate resource allocations, and performance.

A properly implemented IT balanced scorecard yields several results:

◆ It will help IT managers demonstrate the department's impact on corporate profitability and what value it creates.

◆ It will assist IT managers as they evaluate the trade-offs and decide which IT projects provide the largest net benefit to both short-term financial performance as well as the overall long-term success of the organization.

◆ It will help CIOs, CTOs, CFOs, and other senior corporate and financial managers as they develop an IT strategy to make overall corporate resource allocations to support that strategy. They can rely on convincing evidence based on formal measurement and evaluation when making recommendations about these allocations. By having a clear picture of the IT cause-and-effect relationships, these executives can monitor how the IT initiatives are progressing and evaluate their intermediate results more fairly.

◆ The IT staff will know how well they are performing, correct any deficiencies, and, by seeing the results of their work, develop an important sense of personal satisfaction.

Improving the performance measurement in information technology is an important business imperative. Too many IT investments have been made that were poorly analyzed and didn't achieve desired results. With a more careful analysis of the drivers of IT success and with the appropriate measures of success, organizations can make better decisions and resource allocations to improve IT performance and overall corporate profitability. ■

Note: This article is based on and draws from a research project written by the authors and published in January 2005 by CMA Canada and AICPA titled "Evaluating Performance in Information Technology."

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