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Linking IT to Business Metrics

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Abstract

Early efforts to link measures of IT investment with measures of business performance have often been challenged to show consistent organization-level relationships. Managers and researchers alike have often concluded in the past that the relationship between what is done in IT and what happens in business is considerably more complex than originally thought. It has long been argued that technology is not the major stumbling block to achieving business performance, but rather it is the business itself – the processes, the managers, the culture and the skills – that makes the difference. Therefore, a good business metrics program that considers not only IT investments but also how the business uses IT is important. If a business measurement program is carefully designed, properly linked to an incentive program, widely implemented and effectively monitored by management, it is highly likely that business performance will become an integral part of the mindset of all IT staff and ultimately pay off in a wide variety of ways.

Keywords: IT Value, Balanced Scorecard, Performance, Measurement

Introduction

From the first time Information Technology (IT), the bundle of information and communication technologies used by an organization, started making a significant dent in corporate balance sheets, the goal has been to link what a company spends on IT with its performance. Early efforts to link various measures of IT input (e.g., budget dollars, number of PCs, number of projects) with various measures of business performance (e.g., profit, productivity, stock value) often have failed to show an organization-level relationship (Dedrick et al. 2003), although prior researchers were able to demonstrate aggregated effects (eg. Brynjolfsson and Hitt, forthcoming; Hitt, 1999). Since then, researchers have properly concluded that the relationship between what is done in IT and what happens in business is considerably more complex than these studies first supposed. In fact, many researchers would suggest that the relationship is so filtered through a variety of "conversion effects" (Cronk and Fitzgerald, 1999) as to be practically impossible to demonstrate. Most IT managers would agree. They have long argued that technology is not the major stumbling block to achieving business performance. It is business itself – the processes, the managers, the culture and the skills – that makes the difference. Therefore, it is simply not realistic to expect to see a clear correlation between IT and business performance at any level. When technology is successful it is a team effort and the contributions of the IT and business components of an initiative cannot and should not be separated.

However, the dollars spent on IT must be justified in some way. Thus, most companies have concentrated on determining the "business value" that specific IT projects deliver. By focusing on a goal that matters to business (e.g., better information, faster transaction processing, reduced staff) and then breaking this goal down into smaller projects that IT can affect in some way, they have tried to deconstruct the value equation and show specifically how IT delivers value in smaller ways. Thus, a series of surrogate measures are usually used to demonstrate IT's impact in an organization. (See Smith and McKeen, 2002 for a discussion)

More recently, some companies are taking another look at business performance metrics and IT. They believe it is time to reconstruct the value equation and focus on what really matters to the enterprise overall. This perspective argues that employees who truly understand what their business is trying to achieve can sense the right ways to personally improve performance at a business unit and organizational level. "People who understand the business and are informed, will be proactive and … have a disposition to create business value every day in many small and not so small ways" (Marchand et. al. 2000). While the connection may not be obvious it can be demonstrated in tangible ways. The key to linking how IT affects business performance is to create an environment where everyone thoroughly understands what measures are important to the business and is held accountable for them. This point of view does not suggest that all of the work that has been done to date to learn how IT delivers value to an organization (e.g., business cases, productivity measures) has been unnecessary, only that it is incomplete. Without close attention to

business metrics in addition to understanding IT value, it is easy for IT initiatives and staff to lose their focus and thus become less effective.

To look at how these controversial, yet compelling ideas are being pursued in organizations and to better understand how companies are attempting to link IT work and firm performance through business metrics, the authors convened a full-day focus group of senior IT managers from 15 leading organizations from various industry sectors including retail, banking, energy, pharmaceutical, insurance, automotive and manufacturing. Members were asked to describe the ways in which IT is being held accountable for general business metrics, such as stock value, end customer satisfaction, and profit in their organizations.

The first section of this paper describes how business metrics themselves are evolving and looks at how new management philosophies are changing how these measures are communicated and applied. Next, it discusses the types of metrics that are important for a well-rounded program of business measurement and how IT can influence them. Then it presents three different ways companies are specifically linking their IT departments with business metrics and the benefits and challenges they have experienced in doing this. This section concludes with some general principles for establishing a business measurement program in IT. Finally, it offers some advice to managers about how to succeed with such a program in IT.

Business Measurement: An Overview

Researchers generally agree that the primary goal of business is to make money for its shareholders (Goldratt and Cox, 1984; Kaplan and Norton, 1996; Haspeslagh et. al., 2001). Unfortunately in large businesses this objective has frequently gotten lost in the midst of people's day-to-day activities as profit cannot be measured directly at the level at which most employees work (Haspeslagh et. al. 2001). This "missing link" between work and business performance has led companies to look for ways to bridge this gap. They believe that if a firm's strategies for achieving its goal can be tied much more closely to everyday processes and decision-making, front line employees will be better able to create business value. Proponents of this value-based management (VBM) approach have demonstrated that an explicit, firm-wide commitment to shareholder value, clear communication about how value is created or destroyed, and incentive systems that are linked to key business measures, will increase the odds of a positive increase in share price (Haspeslagh et. al., 2001).

> "Measurement counts. What a company measures and the way it measures influence both the mindsets of managers and the way people behave. The best measures are tied to business performance and are linked to the strategies and business capabilities of the company" (Marchand et. al. 2001)

Although companies have always ascribed to this notion in theory, they have not always acted in ways that are consistent with this belief. All too often there is a lack of clarity about the links between business performance and their own

work, individuals and even business units have had to take "leaps of faith" in what they do (Marchand et. al. 2001).

Nowhere has this been more of a problem than in IT. As has been noted so often in the past, IT investments have not always delivered the benefits expected (Carr, 2003; Bensaou and Earl, 1998; Holland and Sharke, 2001). "Efforts to measure the link between IT investment and business performance from an economics perspective have… failed to establish a consistent causal linkage with sustained business profitability" (Marchand et. al., 2001). Value-based management suggests that if IT staff do not understand the business, they cannot sense how and where to change it effectively with technology. Many IT and business managers have implicitly known this for some time (Strassmann, 1997). VBM simply gives them a better framework for implementing their beliefs more systematically.

One of the most significant efforts to integrate an organization's mission and strategy with a measurement system has been Kaplan and Norton's (1996) balanced scorecard. They explain that competing in the information age is much less about managing physical, tangible assets and much more about the ability of a company to mobilize its intangible assets, such as customer relationships, innovation, employee skills and information technology. Thus, they suggest that not only should business measures look at how well a company has done *in the past*, (i.e., financial performance), they also need to look at metrics related to customers, internal business processes and learning and growth that position the firm to achieve *future* performance. While it is difficult putting a reliable monetary value on these items, they suggest that such non-financial measures are critical success factors for superior financial performance in the future. Research is showing that this is in fact the case. Companies that use a balanced scorecard tend to have a better return on investment than those that rely on traditional financial measures alone (Alexander, 2000)

Today, many companies use some sort of scorecard or "dashboard" to track a variety of different metrics of organizational health. Traditionally, IT has not paid much attention to business results, focussing instead on its own internal measures of performance (e.g., IT operations efficiency, projects delivered on time etc.). This has perpetuated the serious "disconnect" between business and IT that often manifests itself in perceptions of poor alignment between the two groups, inadequate payoffs from IT investments, poor relationships and finger-pointing (Dedrick et al. 2003; Bensaou and Earl, 1998; Fabris, 1996; Holland and Sharke, 2001). All too often IT initiatives are conceived with little reference to major business results, relying instead on lower level business value surrogates which are not always related to these measures. While IT organizations are getting much better at this "bottom up" approach to IT investment than in the past (see Smith and McKeen, 2002), undelivered IT value remains a serious concern in many organizations (Santhanam and Hartono, 2003). One recent survey of CFOs found that only 49% felt that their ROI expectations for technology had been met (Holland and Sharkey, 2001). "Despite considerable effort, no practical model has been developed to measure whether a company's IT investments will definitely contribute to sustainable competitive advantage." (Marchand et. al, 2001). Clearly, in spite of massive efforts over many years, traditional IT measurement programs have been inadequate at delivering business value.

Many IT organizations therefore believe it is time for a different approach to delivering IT value – one that holds IT accountable to the same measures and goals as the rest of the business.

Key Business Metrics for IT

It is no longer argued that IT has no impact on an organization's overall financial performance. While there may be disagreement about whether it has a positive or a negative impact, technology is too pervasive and significant an expense in most firms for it not to have some influence on the corporate bottom line. However, as has been argued above, we now recognize that neither technology nor business alone is responsible for the financial impact of IT. It is instead a joint responsibility of IT *and* the business. This suggests that both groups need to be held accountable *together* for its impact. While some companies have accepted this principle for individual IT projects, holding business and IT managers jointly responsible for achieving their anticipated benefits, few have extended it to an enterprise level. VBM suggests that this lack of attention to enterprise performance in IT is one reason why it has been so hard to fully deliver business value for technology investments. Holding IT accountable for a firm's performance according to key financial metrics is therefore an important step towards improving its contribution to the corporate bottom line.

Different firms have different longer-term intents and directions though, influencing the manner and extent to which IT can and will create value. For example, one company may decide to focus on increasing product innovation by investing in integrated design and manufacturing systems (eg. Honda) while another firm may want to leverage their dominance in a supply chain by investing in supply chain management systems (eg. Walmart) (Broadbent and Weill, 1997). Each gains value from IT when they adopt a business view of how to apply IT in a way that strengthens an existing position or capability.

Current wisdom suggests that adopting this view means matching a particular IT usage orientation with a particular business strategy. For example, coupling a utility view - IT is primarily a vehicle to reduce costs, a utility that provides necessary and unavoidable services at a cost - with a cost focused orientation (Carr, 2003); a dependent view - IT is used to enable current operations – with a operational orientation (Broadbent and Weill 1997), or an enabling view - IT creates increasing value over time and achieves long-term goals – with a future focused orientation (Kudyba and Diwan 2002; Dedrick et al. 2003). The single premise is that value is created through proper use; firm management must focus on both how value is created as well as how best to measure value added use. In regard to recent suggestions that IT itself has become a commodity (Carr, 2003), the changing focus on effectively measuring IT value only increases.

However, while financial results are clearly an important part of any measurement of a business' success today, they are not enough. Companies have also come to recognize that effective business metrics programs should also include non-financial measures, such as customer and employee satisfaction. As noted above, since such non-financial measures are predictive of

future performance, they offer an organization the opportunity to make changes that will ultimately affect their financial success.

Kaplan and Norton (1996) state, "The importance of customer satisfaction probably cannot be overemphasized." Companies that do not understand their customers' needs will likely lose customers and profitability. Research shows that merely adequate satisfaction is insufficient to lead to customer loyalty and ultimately profit. Only firms where customers are completely or extremely satisfied can achieve this result (Heskett et. al., 1994). As a result, many companies now undertake systematic customer satisfaction surveys. However, in IT rarely do we find external customer satisfaction as one of the metrics on which IT is evaluated. While IT's "customers" are usually considered to be internal, these days technology can make a significant difference in how external customers perceive a firm and whether or not they want to do business with it. Systems that are not reliable or available when needed; that cannot provide customers with the information they need or give them the flexibility they require are all too common. And with the advent of e-business, self-service systems are being designed to interface directly with external customers. It is therefore appropriate to include external customer satisfaction as a business metric for IT.

Another important non-financial business measure is employee satisfaction. This is a "leading indicator" of customer satisfaction. That is, employee satisfaction in one year is strongly linked to customer satisfaction and profitability in the next (Koys, 2001). Employees' positive attitudes towards their company and their jobs appear to lead to positive behaviors towards customers and therefore to improved financial performance (Rucci et. al., 1998 and Ulrich et. al., 1991). IT managers have always watched their own employee satisfaction rate intently because of its close links to employee turnover. However, they often miss the link between IT employee satisfaction and customer satisfaction -- both internal customer satisfaction, which leads to improved general employee satisfaction and external customer satisfaction. Thus, only a few companies hold IT managers accountable for general employee satisfaction.

Customer and employee satisfaction are both measures that should be part of a business metrics program for IT. With its ever-growing influence in organizations these days, technology is just as likely to affect external customer and general employee satisfaction as many other areas of a business. This suggests that there are three different levels of measurement and accountability for IT:

1. **Enterprise Measures**. These tie the work of IT directly to the performance of the organization (e.g., external customer satisfaction, corporate financial performance).
2. **Functional Measures**. These assess the internal work of the IT organization as a whole (e.g., IT employee satisfaction, internal customer satisfaction, operational performance, development productivity).
3. **Project Measures**. These assess the performance of a particular project team in delivering specific value to the organization (e.g., business case benefits, delivery on time).

Functional and project measures are usually well addressed by IT measurement programs today. It is the enterprise level measures that are usually missing.

Designing a Business Metric Program for IT

The few firms that hold IT accountable for enterprise business metrics believe this approach fosters a common sense of purpose, enables everyone to make better decisions and helps staff understand the implications of IT work for the success of the organization (Marchand et. al, 2000; Haspeslagh et. al. 2001). The implementation of business metrics programs varies widely between companies. In the focus group, there were three different approaches taken to linking IT with business metrics.

Balanced Scorecard. This approach uses a classic balanced scorecard with measures in all four scorecard dimensions (see box). Each metric is selected to measure progress against the entire enterprise's business plan. These are then broken down into business unit plans and appropriate sub-metrics identified. Individual scorecards are then developed with metrics that will link into their business unit scorecards. With this approach, IT is treated as a separate business unit and has its own scorecard linked to the business plan. "Our management finally realized that we need to have everyone thinking in the same way," explained one manager. "With enterprise systems, we can't have people working in silos any more." The scorecards are very visible in the organization, with company and business unit scorecards and those of senior executives, posted on the company's intranet. "People are extremely interested in seeing how we're doing. Scorecards have provided a common framework for our entire company." They also provide clarity for individual employees about their role in how they affect key business metrics.

Sample Balanced Scorecard
Business Metrics

- Shareholder value (financial)
- Expense management (financial)
- Customer/client focus (customer)
- Loyalty (customer)
- Customer-centric organization (customer)
- Effectiveness and efficiency of business operations (operations)
- Risk management (operations)
- Contribution to firm-wide priorities and business initiatives (growth).

Although scorecards have meant that there is better understanding of the business' drivers and plans at senior management levels, there is still considerable resistance to them at the lower levels in IT. "While developers see how they can affect our customers, they don't see how they can affect

shareholder value, profit or revenue and they don't want to be held accountable for these things", stated the manager. She noted that implementing an effective scorecard program relies on three things: good data to provide better metrics, simplicity of metrics and enforcement. "Now, if someone's scorecard is not complete, they cannot get a bonus. This is a huge incentive to follow the program."

Modified Scorecard. Another company in the focus group takes a somewhat different approach to a scorecard. This firm has selected five key measures (see box) that are closely linked to the company's overall vision statement. Results are communicated to all staff on a quarterly basis in a short performance report. This includes a clear explanation of each measure, quarterly progress, a comparison with the previous year's quarterly results, and a "stretch" goal for the organization to achieve. The benefit of this approach is that it orients all employees in the company to the same mission and values. With everyone using the same metrics, there is much clearer alignment all the way through the firm, according to the focus group manager.

In IT, these key enterprise metrics are complemented by an additional set of business measures established by the business units. Each line of business identifies one or two key business unit metrics on which they and their IT team will be measured. Functional groups within IT are thus evaluated according to the same metrics as their business partners, as well as on company and internal IT team performance. For example, the credit group in IT might be evaluated on the number of new credit accounts the company acquires. Shared IT services (e.g., infrastructure) are evaluated according to an average of all of the IT functional groups' metrics.

Modified Scorecard
Business Metrics

- Customer Loyalty Index – the percent of customers who said they were very satisfied with the company and would recommend it to others.
- Associate Loyalty Index – employees' perception of the company as a great place to work.
- Revenue Growth – the percentage of this year's total revenues with last year's total revenues.
- Operating Margin – the operating income earned before interest and taxes for every dollar of revenue.
- Return on Capital Employed – Earnings before interest and tax divided by the capital used to generate the earnings.

The importance the company places on these metrics is reflected in the firm's generous bonus program in which all IT staff participate. (Bonuses can reach up to 230% of an individual's salary.) Bonuses are separate from an individual's salary, which is linked to his/her performance. The percentage influence of each set of business measures (i.e., enterprise, business unit, and individual/team) varies according to the level of the individual in the firm. However, all staff has at

least 25% of their bonus linked to enterprise performance metrics. No bonuses are paid to anyone if the firm does not reach its earnings per share target (which is driven by the five enterprise measures outlined above.) This incentive system makes it clear that everyone's job is connected to business results in some way and helps ensure that attention is focused on the things that are important to the company. As a result, there is a much stronger interest in IT about how the business is doing. "Everyone now speaks the same language," said the manager. "Project alignment is much easier and business executives don't ask IT for junk anymore".

Strategic Imperatives. A third focus group company takes a somewhat different approach. Here, the executive team annually evaluates the key environmental factors affecting the company and then identifies a number of strategic imperatives for the firm (e.g., achieve industry-leading e-business capability, achieve 10-15% growth in earnings per share). These can vary according to the needs of the firm in any particular year. Each area of the business is then asked to identify initiatives that will affect these imperatives and how they will be measured (e.g., retaining customers of a recent acquisition, increased net sales, a new product). In the same way, IT is asked to identify the key projects and measures that will help the business to achieve these imperatives. Each part of the company, including IT, then integrates these measures into its variable pay program (VPP).

The company's VPP links a percentage of an individual's pay to business results and overall business unit performance. This percentage could vary from a small portion of one's salary for a new employee to considerable proportion for senior management. Within IT, the weight that different measures are accorded in the VPP portion of their pay is determined by a measurement team and approved by the CIO and the president. Figure 1 illustrates the different percentages allocated to IT's variable pay component for a typical year. Metrics can change from year to year depending on where management wants to focus. "Performance tends to improve if you measure it," explained the focus group manager. "Over the years, we have ratcheted up our targets in different areas. Once a certain level of performance is achieved, we may change the measure or change the emphasis on this measure.

An important difference from the scorecard approach is the identification of key IT projects. "These are not all IT projects, but a small number which are closely aligned with the strategic business imperatives," stated the manager. "Having the success of these projects associated with their variable pay, drives everyone's behavior. People tend to jump in and help if there's a problem with one of them." The goal in this process is for everyone to understand the VPP measures and to make them visible within IT. Targets and results are posted quarterly and small groups of employees meet to discuss ideas about how they can influence business and IT goals. "Some amazing ideas have come out of these meetings," said the manager. "Everyone knows what's important and these measures get attention. People use these metrics to make choices all the time in their work."

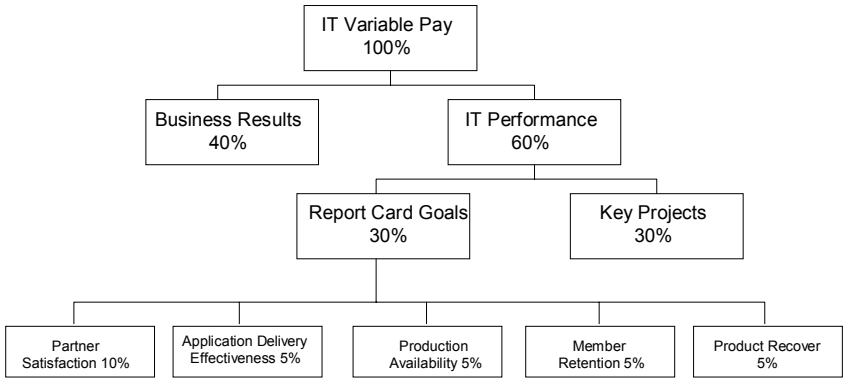

Figure 1. Percentage weightings assigned to IT Variable Pay Components for a Particular Year

While each of these business measurement programs has been implemented somewhat differently, they all share several key features which could be considered principles of a good business metrics program for IT:

1. Focus on Overall Business Performance. These programs all focus employees on both financial and non-financial enterprise performance and have an explicit expectation that everyone in the organization can influence these results in some way.
2. Understanding is a critical success factor. If people are going to be held accountable for certain business results, it is important that they understand them. Similarly, if the organization is worried about certain results, this must be communicated as well. All the focus group companies hold regular staff meetings to discuss results, where people can ask questions. All also provide results on a quarterly basis. Understanding is the goal. "If you can ask…. a person programming code and they can tell you three to four of their objectives and how those tie into the company's performance and what the measures of achieving those objectives are, you've got it." (Alexander, 2000).
3. Simplicity. Successful companies tend to keep their measures very simple and easy to use (Haspeslagh et. al, 2001). In each approach outlined above, a limited number of measures are used. Several members of the focus group commented that it was very easy for any employee to calculate his/her bonus (or variable pay) based on the metrics provided.
4. Visibility. In each of the programs discussed above, metrics were made widely available to all staff on a quarterly basis. In one case, they are posted on the company's intranet; in another, they are distributed in a printed report; in a third, they are posted in public areas of the office. Visibility encourages employee buy-in and

accountability and stimulates discussion about how to do better or what is working well.

5. Links to incentive systems. Successful companies tend to include a much larger number of employees in bonus programs than unsuccessful ones (Haspelagh et. al., 2001). Extending incentive schemes to all IT staff, not just management is therefore important to a measurement program's effectiveness. The most effective programs appear to distinguish between fair compensation for individual work and competencies and a reward for successfully achieving corporate objectives.

Advice to Managers

Focus group managers had some final advice for other IT managers who are thinking of implementing a business metrics program:

- Results will take time. It can take time to change attitudes and behavior in IT, but it is worthwhile making the effort. Positive results may take from six months to a year to appear. "We had some initial pushback from our staff at the beginning," said one manager, "but now the metrics program has become engrained in our attitudes and behaviors." Another manager noted, "we had a few bumps during our first year, but everyone, especially our executives, is getting better at the program now we're in our third year. It really gets our staff engaged with the business." If there has been no dramatic difference within three years, management should recognize that it is either using the wrong measures or doesn't have employee buy-in to the program (Alexander, 2000).
- Have common goals. Having everyone measured on the same business goals helps to build a strong team at all levels in the organization. It makes it easier to set priorities as a group and to collaborate and share resources, as needed.
- Follow up on problem areas. Companies must be prepared to take action about poor results and to involve staff in their plans. In particular, focus group managers cautioned that if companies are going to ask customers and employees what they think, they must be prepared to act on the results. All metrics must be taken seriously and acted on if they are to be used to drive behavior and lead to continuous improvement.
- Be careful what you measure. Measuring something makes people pay attention to it, particularly if it is linked to compensation. Metrics must therefore be selected with care since they will be a major driver of behavior. For example, if incentives are solely based on financial results, it is probable that some people may be so driven they will trample on the needs and interests of others. The value-adding effects of IT are often complementary, meaning that they enhance the value of another business process or organizational capability (Kohli and Devaraj 2002; Bresnahan et al. 2002) The risk posed above is amplified

if the pursuit of one person's interests sub-optimizes another's complementary interests, such as financial goals causing one group to cut back services (eg. database infrastructure) that another group requires to succeed (eg. ERP or Supply Chain Management Systems). If only costs are measured, the needs of customers could be ignored. Conversely, if a metric indicates a problem area, organizations can expect to see a lot of ingenuity and support devoted to addressing it.

- Don't use measurement as a method of control. A business metrics program should be designed to foster an environment in which people look beyond their own job and become proactive about the needs of the organization (Marchand et. al., 2001). It should aim to communicate strategy and help align individual and organizational initiatives (Kaplan and Norton, 1996). All managers should therefore clearly understand that a program of this type should not be used for controlling behavior but rather as a motivational tool.

Conclusion

Getting the most value out of IT has been a serious concern of business for many years. In spite of considerable effort, measurement initiatives in IT that use surrogates of business value or that focus on improving internal IT behavior, have not been fully successful in delivering results. What has not been tried until very recently is expecting IT to participate in achieving specific enterprise objectives – the same goals as the rest of the organization. This paper has shown that there are significant benefits to holding IT accountable for key business metrics. Not only are there demonstrable financial returns, there is also considerable long-term value in aligning everyone's behavior towards the same goals. People become more supportive of each other and more sensitive to the greater corporate good. Decisions are easier to make. A good business metrics program therefore appears to be a powerful component of effective measurement in IT. While IT employees may initially resist accountability for business results, the experiences of the focus group demonstrate that their objections are usually short-lived. If a business measurement program is carefully designed, properly linked to an incentive program, widely implemented and effectively monitored by management, it is highly likely that business performance will become an integral part of the mindset of all IT staff and ultimately pay off in a wide variety of ways.

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