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ABSTRACT

 Information Technology Portfolio Management (ITPM) is a topic of intense interest in the strategic management of information technology (IT). In ITPM, IT synchronization with corporate business strategy is operationalized by the application of the principles of financial portfolio management to IT investments. This perspective is crucial to the continual alignment of business strategy and IT investments. Portfolio management is the discipline of managing projects together as a portfolio that meets corporate objectives. It optimizes development investment and resource allocation across multiple projects. This article investigates current techniques and best practices for managing IT project portfolios and strives to create a solid bridge between corporate strategy and IT investments.

Keywords: IT Strategy, Systems Implementation, IT Strategic Alignment, IT Portfolio Management

INTRODUCTION

Projects are used by companies to convert corporate strategy into new services, processes, and products that are needed for the success and viability of the organization. Selecting the right projects through which to implement corporate strategy is a critically important process. Yet, selecting projects that support corporate strategy is often cited as an area of extreme weakness in many organizations. This misalignment of strategic planning and tactical operations is particularly acute in many IT organizations today (Bonham, 2005).

According to Rosser (2001), the IT portfolio approach suggests that alignment occurs in three ways. By definition, this approach forces engagement between the business and IT. It raises that engagement from a typically myopic review of individual projects to a more complete review that looks across all projects in the context of a comprehensive business strategy. Finally, the IT portfolio approach greatly reduces the emotional aspects of the project prioritization discussion and replaces it with criteria grounded in the business strategy.

ITPM is becoming an indispensable communication tool that helps business executives understand the visible impact that IT operations have on business performance. An IT portfolio is a set of managed technology assets, process investments, human capital assets, and project investments allocated to business strategies according to an optimal mix based on assumptions about future performance. One of the goals of ITPM is to maximize value and risk tradeoffs in optimizing the organization's return on investment. Under ITPM, all of an enterprise's IT projects are placed in a single repository where the risk and reward of each is quantified. Using these metrics, senior management can then prioritize each project.

ALIGNING IT INVESTMENTS WITH CORPORATE STRATEGY

Companies strive to balance the opposing objectives of fiscal restraint and investment risk. This is not a new challenge, as companies have always struggled with this problem. But the challenge has been exacerbated in recent years by various economic and management shortfalls that have limited investments, constrained the availability of capital, and tightened budgets more than usual. To effectively manage these competing objectives, companies must adopt strategic planning practices that identify and exploit strengths while more easily aligning the business objectives of stakeholders (internal and external) (Santhanam & Kyparisis, 1995). Many companies fail to build on their success and stray from targeted business objectives, or fail to build consensus among their stakeholders.

The resulting implications create undesirable effects on financial performance, customer satisfaction, and market share. Therefore, all stakeholders must start from common ground - building strategic plans based on general agreement as to what the relative strengths of a company are and how to consistently manage an investment strategy to further exploit growth. Yet this does not mean homogenizing the business objectives of stakeholders to eliminate competition among them. Indeed, competition fuels innovation (e.g. product differentiation, accelerated time to market). Unfortunately, it also often creates redundancy that increases overall costs and fails to trigger the potential economies of scale of earlier IT investments, hence the opposing objectives.

Therefore, it is imperative to structure strategic planning processes such that the source of corporate value is specified. This is accomplished by defining, prioritizing, and exploiting strategic investments according to the product differentiation, customer intimacy, or operational excellence that forge a leadership position within an industry (Dye & Pennypacker, 1999). No single company can command leadership across all three of these disciplines. Consensus and focus are required to achieve market leadership, which in turn drives strategic investments. It is also imperative that management select and control investments using project portfolio management practices. This must take place to improve and exploit a company's source of value, whether the priorities are product development systems, customer-facing systems, supply partner systems, or employee effectiveness. Portfolio management provides the principles and practices used to weigh the relevant risks and rewards of various investments as they relate to strategic objectives, thereby arbitrating conflict resolution across stakeholders (Solomon, 2002).

BUILDING THE IT PORTFOLIO PLAN

Projects undertaken by the organization should be a reflection of the organization's business strategy and should be able to be directly linked to the components of the business strategy that they support (Cooper, Edgett, & Kleinschmidt, 1997). IT is often highly complex and difficult for non-specialists to understand. It is crucial for business executives to understand enough about IT to make significant and far-reaching strategic decisions. ITPM forges a critical link between the strategic planning process and the project management process, enabling management to reach consensus on the best use of resources by focusing on projects that are strategically aligned with the goals of the business.

An IT portfolio is more than a set of projects. It is comprised of a set of managed technology assets, process investments, human capital assets, and project investments that are allocated to business strategies according to an optimal mix based on assumptions about future performance (Solomon, 2002). One of the goals of ITPM is to maximize value and risk tradeoffs in optimizing the organization's return on investment. ITPM is an optimal way to categorize, capture, and communicate IT value in business language. Value is achieved from the right balance of risk and reward decisions. Through this process, potential risks are identified and the likelihood of occurrence and severity of consequences are determined (Visitacion, 2003). Identifying scenarios and evaluating risks leads to high-value IT portfolios.

ITPM is the continuous process of selecting and managing the optimum set of project-oriented initiatives to deliver maximum business value. Historically, ITPM has consisted of an intensive point-in-time review, with the goals of determining the current state of affairs and of making recommendations for changes in the project portfolio. These endeavors are highly labor intensive and the results are extremely time-sensitive. While valuable in terms of the information it offers, this process typically produces static reports with relatively short shelf lives (Gliedman, 2002). A better process for ITPM is a continuous process of selecting and managing the optimum set of project-oriented investments that deliver maximum business value. Continuous ITPM begins with the development of a plan outlining how broad and deep the portfolio should be (objectives), what measurable expectations exist, and the risk and reward boundaries. Precursors to these activities include determining IT organization's readiness to develop and benefit from ITPM, determining the IT organization's capabilities to successfully implement ITPM (including several capability assessments), and the development of an overall organizational charter for ITPM (Miller, 1997).

Over time, the collection of projects in the portfolio may stray from the stated objectives resulting in disproportionate levels of spending among strategic objectives. As a result, the actual strategic investment may vary significantly from the intended strategy. Strategic alignment analysis will demonstrate opportunities to improve the overall strategic alignment through adjustments to the project portfolio. The portfolio plan is

developed to define the portfolio investment strategy and structure. This plan includes categories into which investments will be split, the target investment mix across those categories, and goals (risk/reward tradeoffs) for the portfolio (Dye & Pennypacker, 1999). Triggers that will cause the portfolio to be re-evaluated and potentially rebalanced are also determined.

Once the investments are listed, the organization can finalize the initial scope and depth of the portfolio management implementation. For some organizations, simply categorizing IT investments and using the portfolio as a communication tool is enough, whereas other organizations elect to apply the detailed statistical and management process disciplines of portfolio management to their business and IT investments (Rosser, 2001). Scale often drives the scope of ITPM implementations: smaller IT groups can follow a simple portfolio management implementation; larger IT groups will benefit from the rigor and discipline of a detailed process. In either case, using a formal implementation process will accelerate business recognition of IT value and provide the most effective basis for ensuring the appropriate IT organizational structure.

As portfolio management matures within the organization, individual ITPM within the IT group emerges. This level of ITPM allows for the active management of a portfolio - proactively balancing risk and reward. The initial target is usually a thematic (e.g. enterprise resource planning (ERP), customer relationship management (CRM)) sub-portfolio of IT assets and projects. Larger-scale IT groups will find it beneficial to appoint an overall portfolio manager to ensure coordination across portfolios. These groups typically combine relationship management (including change and problem management), services and products creation and delivery, and planning and measurement responsibilities.

After the organization develops a comfort level and competencies utilizing ITPM with a sub-portfolio of IT assets and projects, it typically advances ITPM across the entire IT organization (Bonham, 2005). This level of ITPM seeks to integrate all of the IT organization's assets, projects, resources and processes into one IT organization-wide investment portfolio. The process integration knowledge gained by assessing the deployment of ITPM at an individual sub-portfolio level is used to prepare the portfolio management plan covering the entire IT organization. IT organizational processes must be mature and integrated for this level of ITPM to be successful.

Once ITPM is engrained within the IT organization, portfolio management across the entire enterprise is typically the next evolutionary stage in portfolio management maturity. At this level of ITPM, the processes of the IT organization are no longer separate from business processes (Luftman, 1996). IT planning is fully integrated into business planning. Business planning cycles are dynamic, in contrast to the usual static yearly cycles. At this level of ITPM, the focus is on creating highly collaborative, high-performing, enterprise-wide operations that optimize the organization's portfolio of assets, projects, processes, and resources. Business and IT organizational structures are merged into one organizational structure that has integrated portfolio management into its planning and management processes (Rosser & Potter, 2001).

CREATING THE IT PORTFOLIO

The first step in implementing portfolio management is to appropriately categorize the organization's IT investments. A portfolio is a categorized set of assets and investments. The items in a portfolio are typically classified by the level of risk versus expected benefits, the current fair value of the investment, and the expected investment life cycle. The IT portfolio will consist of activities/processes, projects, and assets (e.g. liquid vs. illiquid, expense vs. capital, hard vs. soft, goodwill). The asset and project portfolios should be closely linked (e.g. a major improvement to an asset is a project) (Cooper, Edgett, & Kleinschmidt, 1997).

Many organizations employ a three-category model for asset and project categorization: operate-the-business, expand-the-business, and transform-the-business (Heldey, 1997). Organizations should adapt these categories to their particular context - taking into account their risk tolerance and process maturity. Gray areas between each category will exist and will need to be managed within the linked value management, portfolio management, project prioritization, and business case justification processes. Operate-the-business investments are needed to keep the business functioning. Spending in this category provides mission and business critical services. Common spending

entities in this category include electricity, lighting, heating/air conditioning, telephone dial tone, network services, IT vendor support, and disaster recovery. Typical external influences that modify spending decisions in this category include business climate changes and corporate events or activities (e.g. mergers, acquisitions, divestitures) (Bonham, 2005).

Expand-the-business investments are needed to grow the organization's scope of products and services. Investments in this category might include software upgrades, adding incremental capacity, or developing skills within the staff through additional training and other efforts. Spending in this category affords new levels of process efficiency and effectiveness that the business perceives it will need in the future and which the current assets cannot deliver. Assets in this category influence business performance through process agility (effectiveness), or through the ability to respond to new service requests in significantly less time than predecessors were able to respond. Transform-the-business investments involve project-based spending that creates new IT services that broaden an enterprise's ability to enter new markets. Emphasis in this category is on the speed required to gain control of a new market via first-mover advantage (Luehrman, 1998). Sample investments include new business ventures, mergers and acquisitions, new products, major new business initiatives, and business process outsourcing.

Categorizing IT investments implies first listing the investments and grouping them by business unit and by overall shared services/products. Implementing portfolio management in such an environment can be considered business unit by business unit, with the shared services IT portfolio considered one business unit. Given the typical scale and scope of CRM and ERP projects, significant value to the business is returned by applying portfolio management to the IT investments at the business unit level. As the organization's portfolio management experience matures, grouping business unit portfolios together and managing them holistically is the natural evolution of applying the discipline of ITPM (Miller, 1997).

The appropriate mix of the investment categories must be a dynamic business decision that is driven by market requirements, competition, internal requirements, business strategies, etc. The belief that a proper mix exists is a dangerous assumption or strategy. The operate-expand-transform mix is neither a destination nor a primary performance indicator. Setting a good portfolio mix and managing toward it creates momentum and a performance culture that manages velocity metrics rather than a static portfolio mix. IT organizations that view management of the IT portfolio in this fashion are the most apt to maximize their value to the business (Bonham, 2005).

The assets of a typical IT portfolio consist of applications (e.g. ERP & CRM), data and information (e.g. customers, products, financials), services assets (e.g. consulting, engineering, security), infrastructure (e.g. servers, storage, networks), operations (e.g. data centers, help desks), and human capital. Assets are typically segmented into core, non-discretionary, discretionary, strategic, and venture categories (Visitacion, 2003). Core assets are necessary expenses to enable operation of the IT organization (e.g. power, facilities, maintenance). Non-discretionary assets are typically forced expenditures caused by regulatory compliance, expansion, or the need to replace outmoded or worn-out assets. Spending activity in this category centers on expanding existing capacity to meet growth requirements, rather than to introduce new services.

MANAGING THE IT PORTFOLIO

After the portfolio categories are established, each investment is placed in the appropriate category based on the risk and reward decisions made in the IT portfolio plan. A strong portfolio measurement process is valuable for assessing actual IT portfolio performance against targets set in the planning phase and outlining discrepancies. Monitoring triggers should be established that signal potential portfolio problems. Following a formal portfolio management process will allow the organization to optimize the return on the overall IT investment portfolio and maximize its use in creating business innovation.

The key disciplines of planning and strategy, future-state planning, and project management all overlap at the central core of the IT portfolio (Dye and Pennypacker, 1999). The planning and strategy discipline enables innovation and manages the business related to the particular asset portfolio, while future-state planning designs the

evolution of the portfolio. The portfolio management process consists of two interrelated cycles: asset portfolio management and project portfolio management, both driven by business and IT strategies. These, in turn, frame the enterprise prioritization process for the identification, creation, acquisition, or deployment of the assets (Bonham, 2005).

The asset cycle continually seeks to optimize the value that the assets are able to generate by identifying improvement, optimization, creation/acquisition, and innovation opportunities. Optimal timing for asset disposal/retirement is understood and planned for upfront at asset creation or acquisition. Any projects necessary for asset creation/acquisition/improvement are identified and passed to the project portfolio management cycle. Asset usage is monitored to ensure optimal return and value generated is assessed regularly to drive the appropriate use/retirement/enhancement strategy (Dye and Pennypacker, 1999). The typical asset portfolio will include applications (ERP, CRM, e-mail, etc.), data and information, services, hardware, processes, and human capital.

The project cycle actualizes the prioritized business transformation opportunities identified in business/IT planning and asset improvement identification. New projects are added either as recently identified and prioritized opportunities or as previously developed scenarios whose triggering event has occurred. Project adjustments (accelerate, slow down, retire) may also occur based on regular reviews of the projected value that the project will generate (Visitacion, 2003). Organizations should re-evaluate the business cases for both ongoing and non-triggered projects and take appropriate action to optimize the portfolio's value. This re-evaluation should occur on a regular basis, preferably quarterly. As projects enter the portfolio, their implementation is overseen and managed. Delivered projects' value is measured and assessed against initial expectations. Modified/created assets are transferred to the asset portfolio and managed as previously described.

This process begins with a review of the findings uncovered during the portfolio analysis. Strategic alignment issues may have been identified or over-allocated resources may indicate that the project portfolio is not achievable. Before making any changes to the project portfolio, clear objectives should be defined that target the desired outcomes. A review of cost and resource impacts will uncover adjustments to make before arriving at an achievable project portfolio. The process continues by reviewing strategic alignment and balance. Through multiple iterations, trade-offs are considered and final adjustments are made to arrive at the optimal project portfolio (Bonham, 2005).

The ITPM process is designed to create the best project portfolio within the political, environmental, and technology constraints of the organization. In virtually all cases this means that the final project portfolio will be sub-optimal in some respects, but it will be the best project portfolio the organization can implement at that particular point in time. Optimizing the project portfolio employs a collaborative approach to manipulating and reviewing the project portfolio. Because of the many variables, reaching consensus can be challenging. Real time what-if analysis in a group setting is not very efficient. However, scenario planning can help contain the discussion to the merits of multiple alternatives (Dye & Pennypacker, 1999). This approach relies on decision makers to define the scenarios and constraints. Then, project portfolio analysts develop multiple alternative portfolios offline to ensure that each is achievable given current constraints. The merits of each alternative are reviewed, resulting in a consensus decision or direction for refining the alternatives.

ASSESSING IT PORTFOLIO EXECUTION

Organizations typically use financial models to measure the value of their projects. These models use metrics, such as net present value (NPV) and the internal rate of return (IRR) (which consider the value of money invested over time and the cost of the company's capital) to evaluate the cost of implementing projects along with a stream of future benefits (Visitacion, 2003). Depending on the project, the financial benefits may be in the form of expected operating cost reductions, revenue growth, or both. While financial modeling is an important aspect of determining value, it is not the only aspect of value. Non-financial benefits like increased market share, improved customer satisfaction, and reduced defects can be quantified and measured using non-financial metrics. Scoring models that use non-financial metrics and ratings provide another form of value measurement (Dye & Pennypacker, 1999). As organizations mature their value measurement, they often employ a mixed model that combines financial metrics with non-financial scoring to rank projects.

There are two major challenges in determining project value. The first is defining a method that allows for the comparison of the value of one project to another. Most projects have many intangible benefits making it difficult to compare one to another. Also, very large projects often have even larger costs so the net of benefits minus costs is important for comparing projects. The second major difficulty is to compensate for the time value of costs and benefits. Generally, project costs precede the benefits and the value of the benefits received today is worth more than it will be in the future.

Financial models address both these issues by translating costs and benefits into offsetting streams of discounted cash flows (DCF). NPV and IRR are the most common models, however, there are a number of variants with application to capital budgeting decisions in general and to ITPM in particular.   NPV incorporates the opportunity cost of capital, also called the discount rate, into the discounting equation for calculating an absolute economic value to the organization. It is widely considered the best absolute measure of value (Grochow, 1996). IRR is a rate or ratio, not an absolute amount. This ratio is useful for comparing unlike investments.   It is also useful for making comparisons between different periods, different sized projects, and for making international comparisons.

In most cases, the benefits from each project do not start accumulating until the project has been completed and then the benefits often extend months or maybe years beyond the end of the project. Therefore, to accurately measure a project's return on investment (ROI), it is important to keep the project in the portfolio well past the completion date. Having captured the actual costs and benefits attributed to each project, the organization can use the same financial models used to estimate value (e.g. NPV, IRR, etc.) to calculate a project ROI over some period of time. More importantly, capturing actual costs and benefits at a project level allows the organization to measure ROI for the entire project portfolio (Gliedman, 2002). This provides an objective measure of the value that the project portfolio is delivering to the organization and it helps executives understand how to balance the projects in the portfolio.

COMMUNICATING THE IT PORTFOLIO

It is critically important that all stakeholders understand the IT portfolio plan and any changes made. This involves developing communication plans, delivering the messages to stakeholders, and measuring communication success. Communication is particularly critical part of the initial adoption of ITPM in an organization (Pastore, 2003). As the portfolio management process evolves into a continuous cycle of analysis and fine-tuning, the portfolio changes become less significant and the adjustment process becomes more efficient through standard practice. When implementing large changes to the project portfolio, there is risk of pushing the organization into a long adjustment period of very low productivity as plans are adjusted. Clearly communicating the changes required to move to the newly optimized project portfolio, as well as the logic behind the decisions, is critical to minimizing any down time associated with the change in strategic direction.

According to Visitacion (2003), effective communication serves two objectives. First, it clearly outlines the changes and unambiguously defines the new direction. The new project portfolio represents a top-down plan that sets direction and constraints to guide the bottoms-up planning activities. The new direction and constraints, along with any assumptions, must be clearly conveyed to make the detail planning as efficient as possible. Secondly, communication provides the rationale for project teams to make changes in support of the "bigger picture". Ensuring project teams understand their role and their contribution to the value, balance, and alignment of the project portfolio is important for building buy-in and support. Buy-in is not a black and white issue, but rather a matter of degrees. The more buy-in and support obtained, the more efficiently the changes will be implemented and sustained.

IT PORTFOLIO GOVERNANCE

IT governance is about assigning decision rights and creating an accountability framework that encourages desirable behaviors in the use of information and technology. ITPM is a powerful tool for IT governance that requires close connections among principles, processes, people, and performance (Datz, 2003). As IT services are increasingly embedded in business operations, the IT focus shifts from cost efficiency to operational effectiveness and business process enhancement. To develop a strategic role within the business, the IT organization needs to

pass through several phases, from being an order taker to becoming an integrated business partner with the rest of the company's activities. To make this evolution, the IT organization must educate the business about the services it provides (in terms of costs, quality, time to market, value, and risks involved), while constantly managing and maintaining a balanced portfolio of assets and projects that support the business.

The heart of IT portfolio governance is the strong connection between principles, processes, people, and performance. Principles and processes, the backbone of governance and organizational culture, are fundamental to ITPM (Dye & Pennypacker, 1999). IT portfolio governance must establish enterprise-wide governing principles to articulate governance guidelines within which expected behaviors occur within the enterprise.   In many organizations, the IT portfolio manager role is initially fulfilled by the CIO and functional vice presidents or directors. A governing body should be created, that includes senior IT and business unit leaders, which develops the principles for governing that are appropriate for the organization.

The principles component of IT portfolio governance has two primary functions: principle development and principle compliance. A consistent set of principles must articulate the guidelines within which expected behaviors occur with the intent of directing the enterprise toward an acceptable level of commonality (Miller, 1997). Examples of IT portfolio principles include the decision that IT investments are classified as either assets or projects, the decision that investments will be divided into categories meaningful to the business and relevant to the IT organization (operate-the-business, expand-the-business, transform-the-business), and the decision that the investment mix is to be defined by an IT portfolio steering committee, with balancing and tuning recommendations made by the IT organization.

A set of consistent, enterprise-wide, processes must be defined to execute the governing principles. These processes can broadly be grouped into operational processes, administration processes, financial processes, logistics processes, and strategic processes. Effective IT portfolio governance requires governing bodies to ensure that the relevant principles and processes are developed, adhered to, and evolved over time. These groups include the executive steering committee, IT steering committee, IT architecture team, enterprise program management office, and various centers of excellence. The most overlooked and ill-managed aspects of IT portfolio governance are the controlling of the performance (controls and checks) of the various IT governance processes and the monitoring of the compliance with established principles (Meredith & Samuel, 1995).

CONCLUSION

Strategic planning needs to be a continuous, collaborative process. Strategic planning is no longer a five or ten year vision setting exercise. It is a way of looking at conditions and initiatives that are just one to three years out. The process of strategic planning needs to occur continuously in organizations. The corporate strategic plan should serve as a commitment platform for IT initiatives (Heldey, 1997). Strategic planning needs to become a core competency of the organization for its long-term success. A strong CIO with vision is required to assist in building the strategic planning competency of the organization. Building stovepipes (one person does one thing, another person does another thing, and they never talk), treating planning as an ad hoc process, making planning a one-time event, and failing to measure initiatives, will cause the organization fail in the strategic planning process. ITPM is a disciplined process that helps to ensure that the strategic planning process is successfully conducted, implemented, and maintained.

ITPM is rapidly becoming an essential tool that enables business leaders to understand the visible impact IT operations have on business performance (Datz, 2003). IT synchronization with corporate business strategy is cited as the number one concern of IT executives worldwide today. ITPM is increasingly recognized for its potential to support the continual alignment of business strategy and IT investment. As a result, leading corporations are placing a greater emphasis on ITPM as they attempt to make their enterprises more agile and competitive in today's global, hyper-competitive, business environment.

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