

Process Integration in it Portfolio Management

Mohan Sharma, Philadelphia, PA
Rajneesh Sharma, Ph.D., Saint Joseph's University, Philadelphia, PA

ABSTRACT

In the past few years, many Information Technology (IT) departments have been vastly expanded or created, and new processes have come into existence. With these increasing numbers of elements, organizations face the challenge of process integration. They must seek to integrate what are often rapidly changing sets of procedures to make processes work synergistically and maximize the return from IT. Current process frameworks and guidelines such as Capability Maturity Model Integration (CMMI) or Project Management Body of Knowledge (PMBOK) fall short of the challenges posed by process integration in Information Technology. This paper provides the basis of a framework for IT process integration. To do this, two groups of integration strategies are considered. First, we discuss horizontal and vertical integration strategies as a single group. We then address a second group of initiatives consisting of foundation building, innovation, and automation as complementary strategies to the first. Finally we discuss future trends in process integration.

INTRODUCTION

Every aspect of Information Technology (IT) is evolving: Architecture, technology, processes, governance, tools, systems, size, complexity, the functionality of applications and packages, and the many new ways in which IT is being used and is anticipated or en route to being used. To meet current business needs, a large number of entities have cropped up under the broad umbrella of IT. Needless to say, within these entities, there has been an explosion of new processes and concomitant new challenges.

Firms face substantial and complex challenges in serving and integrating these new entities. From a process perspective, IT faces the challenge of ensuring that each of these myriad processes not only works effectively, but also that they work well with each other as an integrated whole. Organizations have to integrate ever increasingly numerous processes so they function as a team to maximize the return from IT. Driven by the pressure on businesses to perform, theoretical understanding of these issues is gaining momentum. However, more progress needs to be made in reality. This paper provides a framework for IT process integration.

Our framework is less concerned with the semantics of individual process integration than with creating conditions that force management to think about and analyze 'the big picture'. Many of the techniques described are already in use, some with different names, however, we formalize and combine various practices of IT process integration. IT integration itself can be traced back to the 1970's, when some organizations started mainframe or processor based systems that incorporated some discreet calculations into an organized set of procedures. From being a fringe department exclusive to the largest firms, IT has now become one of the most prominent and influential arenas in organizations of all sizes. Most firms realize that managing their portfolio of IT processes is a key decision.

We approach IT process integration by positing the importance of a comprehensive way of thinking. Due to the increased number of processes deployed within an institution at any time, certain parts of organizations often remain sub optimized. A disconnect often results from mechanically focusing on single processes and overlooking the portfolio implications of their interactions. Furthermore, many of the existent models or guidelines, such as the Capability Maturity Model Integration (CMMI), Information Technology Infrastructure Library (ITIL), and Project Management Body of Knowledge (PMBOK) are currently unable to address integration of the plethora of processes that are now part and parcel of any large IT portfolio. CMMI is currently not able to address the shared services or management components of IT. ITIL fills the gap, particularly for operational aspects of IT, while PMBOK remains relevant from a project management perspective. Typical IT organizations need these guidelines only in some areas.

We describe how to integrate processes by emphasizing the issue of interdependencies and creating a portfolio approach. Horizontal integration is like team-building; various processes support each other, leading to collective process maturity. This approach privileges the importance of connecting across process boundaries. Vertical integration concerns itself with the hierarchic arrangement of processes. This eliminates inefficiencies and irrelevancy in processes at higher levels, due to support from those below.

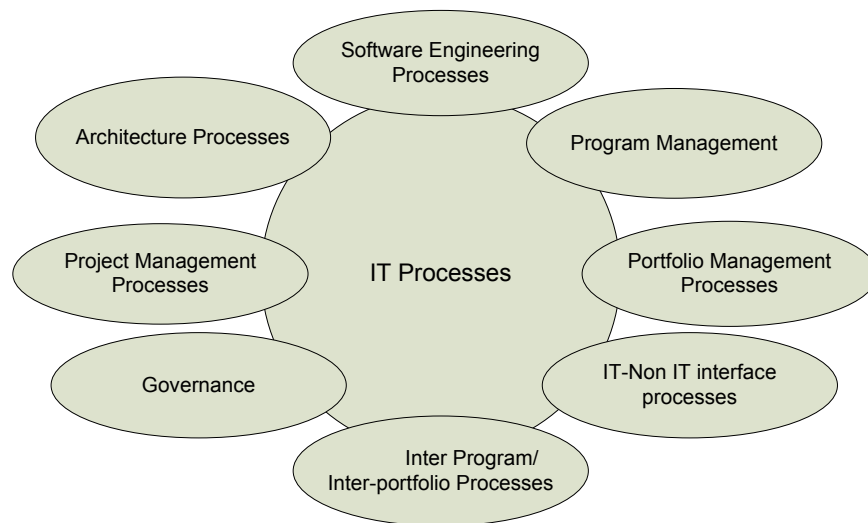
In addition to vertical and horizontal integration, three more strategies are relevant here, namely: Foundation Building, Innovation, and Automation, which need to be combined in order to maximize returns. Foundation building is an excellent strategy for every organization to pursue. It is also especially useful for firms that have a low maturity of processes, or in cases where an IT portfolio is undergoing expansion. Innovation is particularly relevant; it is the means by which processes are set up in a way that meets their IT ends. Innovation at lower end could consist of taking a well recognized industry process and tailoring it for specific needs. At the higher end, it might entail setting up an entirely unique process for which there may be few or no references outside the organization. Good IT governance can be achieved by tapping unexploited synergies, or maneuvering existing processes to maximize visibility, control, and agility. Automation is essential for processes that have high recurrence rates, and in which each occurrence is similar to others. These have standardized features where automated infrastructure brings speed and capabilities that are not possible via manual processes.

The remainder of this paper develops as follows; we discuss the shortcomings of current systems and the need for an overall integration plan in section 2. Section 3 describes horizontal and vertical integration. Section 4 covers Foundation building, Innovation and Automation. Section 5 discusses future trends and concludes.

IT ORGANIZATION AND IT PROCESSES

A quick look inside any large organization clearly indicates that they almost uniformly have a plethora of IT processes. Most of these processes can be categorized as shown in figure 1. The extent and the number of these processes are contingent on the size and strategy of each firm.

Figure 1: IT Processes



This is particularly true for medium to large sized organizations. Whether highly formal or somewhat informal, any organization high in architecture maturity utilizes these processes.

Process integration and alignment for team play

For IT return maximization, different groups within IT need to work in alignment with each other. The degree to which these various groups and subgroups work in synergy is a determining factor for the IT maturity of the organization. It is imperative that processes performed by the various IT organizations be in synch and collaborative. The process integration strategy must be calculated as part of any process improvement strategy. But, just as elements within an IT department need to work collaboratively and in alignment with each other, their processes need to work collaboratively and alignment at a technical level. In fact, latter is the means to achieve the former. Alignment ensures that the bigger organization achieves much more than the sum of its parts. (Kaplan and Norton, 2006).

Changing development dynamics: From process maturity to process integration

The number of IT groups within an organization increases alongside the rising number and scope of IT processes. This causes an exponential increase in the interplay between these groups and processes. The number of processes in each group that support those of other groups grows at an accelerating rate. For example, software development processes used to dominate IT processes. Even CMM and ISO process frameworks used to be highly software process focused in the traditional mould of linear application development. While groups were small and the applications were less complex, process integration was not much of an issue. The dynamics have shifted towards a highly integrated development and management framework. Applications are getting more and more intricately integrated, the proportion of IT investment in enterprise applications has increased, and shared services now play a more active role.

A few years back, tasks like data design, architecture design, and integration patterns used to be the responsibility of a single development team. Now these tasks are usually the responsibility of separate teams. Many of these are occasionally now part of shared services. For example, data design teams design databases for a new application to suit organizational data standards. Architecture teams work with project architecture teams to develop a structure such that the project architecture fits the enterprise architecture framework. A seemingly straightforward project has multiple tasks insourced to specialized groups within the organization.

So in comparison with the past, applications that currently deliver the same functionality will involve more teams consequent to the higher level of interpenetration of processes. So while the net result could be similar in terms of the application's functionalities, more teams have to work together now to deliver a set of procedures. This is the outcome of shared services, IT governance, architecture maturity (Ross et al, 2006), and the increasing role of IT in enterprise strategy. The development of these shows no sign of decreasing its pace of growth.

Disconnect in IT processes is a Strategic Risk

Marakon Associates and the Economist Intelligence Unit conducted a survey finding that firms achieved only 63% of the expected results of their strategic plans (Marakon Associates, 2006). Furthermore, as Hrebiniak (2005) states, we may conclude that in most cases it is not the strategy but the execution of the strategy that causes these failures. A set of processes which do not work in a well-coordinated manner cannot be relied on to successfully implement a strategy. Without execution, breakthrough thinking collapses (Bosidy and Charan, 2006). These days, more companies have IT as a key component of their business strategy than ever before. To the extent that the multiplication of components increases as described above, their disconnect is frequently also high, and poses a strategic risk. Organizations that put these processes to work as an integrated set have a competitive advantage.

Another example indicative of the need for proper integration is the area of mergers and acquisitions (Galpin and Herndon, 2000). Many acquisitions are not able to deliver anticipated benefits. Business synergies have driven acquisitions and mergers, but these business synergies need to be implemented at the level of praxis. Business processes directly rely on IT to execute their integration, and if an IT department is not able to integrate its own processes, it cannot be relied to integrate those of a totally new organization.

Which framework covers all processes?

Over the last twenty years, the advent of various frameworks has periodically revolutionized the IT industry. Though each of these frameworks deals with certain aspects of process integration, none provides a comprehensive structure. The Capacity Maturity Model (CMM), originated at the Software Engineering Institute at Carnegie Mellon University and provides for assessment of process maturity. Each level of CMM from 1 to 5 denotes a higher level of maturity. The framework was further expanded to Capability Maturity Model Integration (CMMI), incorporating different models and more research. This work has been implemented in practice, providing increased efficiency in software development. CMMI can also be used successfully in project management and program management (SEI website, 2009). CMMI covers a good range of processes in IT Project Portfolio, but cannot solve the process increasing areas of need that fall outside of its scope. In summary, it covers only a subsection of IT processes, largely focused on development. Similarly PMBOK guidelines are suited to projects, but not to programs or portfolios. These models function well in governing their respective tasks, however, they cannot be expected to resolve problems for which they were not designed. IT governance and portfolio management are still evolving, and there is no consensus on what should constitute guidelines for these processes. At a higher level of abstraction, it will take some time for portfolio or program management processes to become standardized. PMI has made a good attempt in articulating them in their publication (PMIa, PMIB). Every industry

and company is unique, and management expects different kinds of transparency, reports, and roles from their program management. Accentuating the problem, program management and portfolio management differ more from company to company than software development. In summary, it is difficult to conceive of someone coming up with a framework with a one-size fits all approach.

PROCESS INTEGRATION: HORIZONTAL AND VERTICAL

We propose an initial separation of Process Integration into two dimensions. The first dimension of horizontal and vertical integration is at the core of the strategy. These two integrations are performed as snapshots of an organization. There is analysis, design, and implementation of the integration strategy. The second dimension of process integration consists of secondary tools, namely: foundation building, innovation, and automation. These are implemented on a continuous basis. Though the actual implementation of the two categories in practice may be similar, it is important to understand the role of each group.

Horizontal Process Integration

Horizontal process integration leads to a new value proposition through the teaming of processes. Each process is relevant individually, but through meaningful cooperation provides advantages which are much bigger in scope. Earned Value Management, (EVM) a technique for measuring project's process, is one such process where processes of cost, schedule, and scope are coordinated. The collective value is much greater than what each process of cost, schedule and scope would have provided separately.

Consider two projects for which status has to be reported. Assume that all Cost and Schedule reporting is based on the original estimate. One project was estimated 50% on the high side, another 20% on the low side (IT size estimation is occasionally quite off the mark and this scope of error is more the norm than the exception). When it comes to reporting, the first project, which had an estimate error of 50% on the higher side, if delivered on time and budget, has nonetheless required 50% more than what it should have. For second project, which had estimate error of 20% on the lower side, if delivered with even 10% trespass over budget, it is considered a poor performer. In fact estimation was more accurate for the second, and this project has actually performed much better than the first. Due to weak processes (in this case the estimation process), the project reports characterize second project's performance as poor. These process weaknesses encourage overestimation, and thus waste.

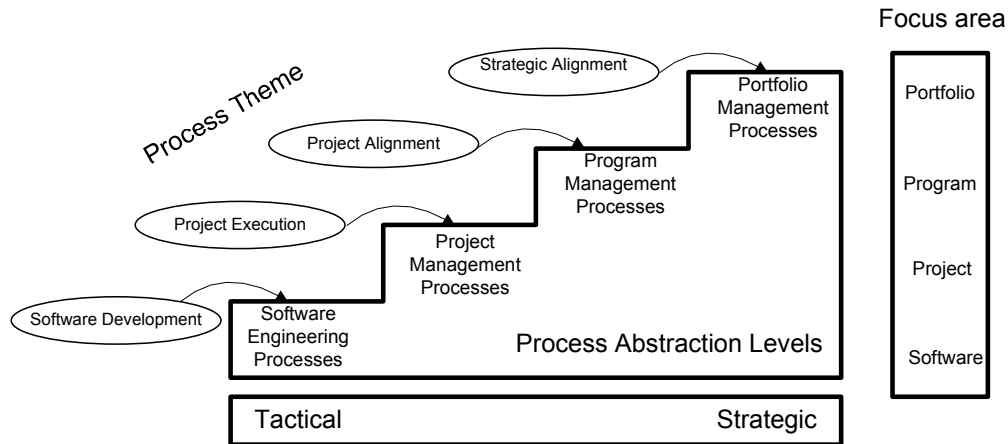
Also, in a volatile project, a schedule and budget that do not address questions of scope will make the project status report meaningless. A project with more functionalities than originally planned, if delivered according to the original schedule, is a project completed ahead of schedule and a job well done. By the same token, a project delivered on its original schedule but with less functionality, is in fact over budget and schedule. This example shows one of the ways weak software engineering processes make the job of meaningful management reporting very difficult. EVM is a technique integrating scope, cost, and schedule, which is now being adopted by high maturity organizations that appreciate this problem. This is what process integration delivers – business value that a vertical process cannot deliver on its own, however good it may be. EVM shows how horizontal integration of processes for cost, scope and budget can be very valuable.

Another example of Horizontal Process Integration is in the concept of Application Lifecycle Management (ALM). ALM regards the process of delivering software as a continuously repeating cycle of inter-related steps: definition, design, change management, development, testing, deployment and management.

Vertical Process Integration

In vertical process integration, lower level processes feed into processes at higher levels. If a process at a higher level of abstraction is not able to gain advantage from the processes below, it will be limited in value. For example, one of the most common processes in any program is 'Status Reporting'. Individual projects' status reports are consolidated to develop a program status report. Many organizations have ad hoc program reporting despite the absence of individual project reports. This is due to sub-optimized process integration causing a lack of data or metrics. Further, project management processes in turn depend on software engineering processes for data. If the basic software engineering practices are not in place, the data for project management will be difficult to obtain or use. Figure 2 shows the various levels.

Figure 2: IT processes dependencies



The processes at the fundamental level are software engineering processes such as requirements management, estimations based on requirements, configuration management, SQA etc. At the second level are project management processes, which depend to a great degree on software engineering processes. The third level consists of program management processes; these depend in turn on project management processes. Finally, portfolio management processes are at the top. This ladder approach emphasizes how this is a staggered trajectory. For example, mature program management processes cannot be achieved without successful maturity in the area of project management processes.

FOUNDATION BUILDING, INNOVATION, AND AUTOMATION

Once vertical and horizontal strategies are implemented, the second dimension needs to be addressed. This is where organizational culture and the leadership of management have the greatest opportunity to add value. The key is to create a synergy such that strategies complement each other and focus on needs unique to the organization

Foundation Building

There are certain foundations that every organization can establish which will help in integrating and aligning these processes for maximum value creation. Successful vertical integration requires efficient processes at the core of the company. Basic software engineering processes lay the foundation for project management processes, because good project management needs data from processes that are software engineering in nature. Estimation, scheduling, scope, risk management, quality are some common project management processes which can be robust only when the supporting Software Engineering Processes such as size estimation, requirements management, and software change management are strong. Similarly, for program management, basic software engineering and project management must be in place. Since for Program management some other pieces of information are also required, e.g. financial data, these processes should also be considered part of the foundation of Program Management processes. In short, every process of higher abstraction must absorb the process capability of the process of lower abstraction. For large organizations, the number of processes required to attain the higher abstraction level is high. E.g. In a large organization, portfolio management processes depend on IT Governance, IT alignment (e.g. balanced scorecard), Financial, and accounting processes, each of which has their own supporting fundamental procedures.

Innovate

Process frameworks like CMMI, PMBOK cover different aspects of strategic management. No framework covers all portfolio, program management, or IT governance processes. Companies therefore need to create their own unique environment, based on correspondingly particular management expectations. PMO, Program management, and Portfolio Management require lot of innovation and experimentation. Foundations will help, and are necessary, but innovation is required for processes of higher abstraction. There are many tools available in the market to cater to different needs, but even the most versatile tools are appropriate only for portions of management processes at this level. Whether the tools are in-house, macros-powered excel sheets, or the off-the-shelf tools, what needs to be done requires a lot of analysis, selection, and innovation to discover as well as to implement. For

example, often there will be a number of Portfolio Management tools on the market, but none fits all the needs of the organization. Generally, the problem is not just the lack of some capabilities in the tools, but that each organization is different and has different driving factors behind portfolio management and program management.

Automate

A project from initiation to deployment may involve multiple groups, and any number of horizontal and vertical layers of processes. Automation plays a very important role in integrating processes. Automation means more than only automating each process; it also demands automated integration of these processes (Khan, 2000). For example, in enterprise projects, which usually involve more than a hundred people from various departments, geographically spread out, a given individual may not ever know more than 10% of the other people involved in their project. Tools that consolidate data from these teams are very helpful in such a scenario. For project management, tools that consolidate project plans from various dependent teams can complete a task which otherwise is not only difficult, but may simply be impossible. For a PMO, with more than 50 projects underway, automated processes that generate EVM reports can construct a picture of the portfolio that is otherwise very difficult to glimpse. Similarly, a well-designed change management workflow system can significantly increase the quality and speed of collaboration. Every organization that practices software development or implementation would like to improve its process, whether or not it wants to acquire a CMMI level. However, for those not seeking a certification, the motivation to follow a documented process is often low. Often, a rigorous documentation process, if it creates a lot of overhead, very soon loses steam. Automation, if carefully implemented, increases discipline, and reinforces commitment to documentation procedures. E.g. if a change management request can only be filled into a web based workflow system, it requires no further documentation. For an analysis team, the information they need is already there in system, they just need to pull it and extrapolate from it. When the number of people, departments, and teams involved in a project is vast, and at different levels of process maturity and process commitment, the way to achieve consistent, transparent process is through automation. Automation is the enabler and the documentation, absorbing information while it works.

SUMMARY AND TRENDS

The landscape of IT processes is getting increasingly complex. Companies that move to a higher level of architecture maturity will deliver to the best of their potential by integrating their IT processes.

Process focus will continue to evolve from the domain of software development to cover a more comprehensive organizational view. CMMI is big leap from CMM in this direction, but the pace of evolution is so extreme that by the time processes catch up with the environment, new process weaknesses are already visible. There is currently a consolidation taking place among tool development companies. Change management, requirement management, project management, and portfolio management tool companies are going through mergers and acquisitions. Those vendors who are not going through mergers and acquisitions are either widening the range of their process improvement tools, or making their specific product ready for integration with other tools. This will 1) alleviate the pains of implementing and integrating multiple processes and will 2) make their tools to have more synergy with other process improvement tools. Many Configuration Management tool companies are positioning their tools as Application Lifecycle Management products by increasing the functionalities and capabilities of their tool suites.

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