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# When the CIO Manages IT as a Business

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# Introduction

**“We’re the cobbler’s children in IT. We develop all these great systems for our customers and our clients; yet, if we look at our tools to manage our processes, we’re not wearing any shoes.”**

*—IT Director, large networking firm*

IT investment will increasingly be linked directly to the IT department’s ability to support business objectives in a timely manner. In fact, by 2003, according to Gartner research, 75 percent of information systems (IS) organizations will refocus their mission toward the brokering of resources and facilitating business demands, rather than their traditional role as direct IT service providers (SPs). By this, we mean the IS organization will increasingly work with line-of-business managers to assess the feasibility of projects, generate budgets, develop plans and set priorities, while delivering the traditional IT functions of development, support, maintenance, etc.

The enterprise will tolerate neither downtime for an enterprise-wide software upgrade, nor delays in moving from a legacy environment to an e-commerce one, nor bottlenecks created in disparate operating environments when businesses and operating divisions come together and are split apart again. The routine will have to be automated—and the difficult made routine—if the CIO is to meet the challenges of the current operating environment.

Because of the potential for IT to have such a strategic impact on a business, today’s enterprise demands much more of the CIO than it has in years past. As Gartner analyst John Mahoney has observed, “Excellent leadership from the CIO and excellent enterprise engagement with technology are critical to success and survival in the new economy.” The CIO is playing an ever more critical role in driving the business forward, and the CIO role now clearly steps beyond the traditional cost-center mindset of streamlining costs. Rather than just being a cost of doing business, IT (and the CIO) is now considered a strategic investment that supports revenue and company performance, differentiating an enterprise from its competitors.

In this paper, we will examine how CIOs can align IT processes and efforts with those of the overarching business needs. We will further examine the challenges facing the CIO, who must increase operational efficiency to please a large number of stakeholders, including the investment community, the corporate board of directors, internal and external customers and partners, to name just a few of the groups to which a CIO must answer. We will propose that the CIO’s IT organization, which undoubtedly has challenges in dealing with the complexity of its tasks and the need for efficiency, should recognize the importance of explicit processes in order to capitalize on them and ascend the ladder of business/IT synergy. In other words, making IT processes explicit in this enterprise will help ensure that the cobbler’s children won’t go barefoot.

# Aligning IT Initiatives With Business Objectives—Examples of CIO Problems

With such a heavy load of evolving responsibility weighing on the CIO's shoulders, it should come as no surprise that many perplexing management issues arise when aligning technology capabilities, budget considerations and strategic business concerns.

## Problems Posed by Complexity

Many of the key management challenges facing the CIO involve exponentially branching webs of complexity. No longer is an IS shop a static, orderly collection of same-generation components that interface in a consistent, predictable manner inside rigidly defined organizational walls. Technology evolves at a rapid pace—sometimes with an almost chaotic urgency—making IT competitive advantage more difficult and costly to establish and maintain.

At the same time that complexity is increasing, IT organizations are outsourcing more of their responsibilities, leading to an intricate, shifting structure of relationships, competencies and service-level agreements (SLAs). The role of the SP is expanding. SPs are involved at the following three distinct levels:

1. The infrastructure level (hosting SP, storage SP, network SP, technical support SP, etc.)
2. The business-applications level (application SP, independent software vendor, developer SP—and for Internet/"e" initiatives, commerce SP and content SP)
3. The business-processes level (external service providers, the "Big 5," business process SP).

As the SPs take on more functions, the role of the IS group becomes one of managing these SPs and of coordinating the integration of their different tools and environments (e.g., mainframe, NSM, etc.).

A key SP management tool is the SLA, which allows the IS group to monitor the performance of the SP, and often affects the fees paid by the enterprise. Before SLAs can be used, much work needs to be done to define and document processes, train employees and establish benchmarks. Therefore, although SPs can assist the IS organization with meeting the increasingly complex challenges, a consequence of receiving this help is that the IS groups need to do some process re-engineering of their own.

An extra layer of complexity is added when one considers the amount of collaboration occurring within IT business units these days. For reasons of cost advantage and resource availability, an IT workforce can literally be spread across continents. Managing projects and processes globally is challenging, as is mapping all projects and applications to widely scattered human resources while supporting specific business objectives.

Not only has managing an IT portfolio become more complex as it spreads throughout and beyond an organization, but the organization itself also changes in ways that affect IT processes profoundly:

- How does the CIO integrate systems and processes efficiently in a merger/acquisition situation when the IT organizations involved do not share common methodologies, strategies or tools?
  – On the other side of that question, how can the CIO disentangle and splice systems and processes in a spin-off?
- How does an IT organization establish processes to scale from legacy systems to client/server systems to e-business systems in times of massive, strategic movement in the development, adoption and deployment of technology?
- How does the CIO prioritize the vast array of scattered initiatives that result as organizations change?

With these trends in mind, it becomes interesting to examine how the CIO manages a dynamic portfolio of projects executed within the walls of the IT silo, within the walls of other enterprise business units, and with help from various partners or outsourcing providers. Portfolio management—from large, enterprise-wide initiatives like CRM to mundane tasks like resetting passwords—takes on extra layers of difficulty. Who has responsibility for what initiatives? How can the CIO prioritize initiatives efficiently and in accordance with organizational priorities?

How can anyone ensure that efforts are not replicated within the extended boundaries of the IT organization and its partners?

## Issues Surrounding Efficiency

**“If people would just stop and open their minds to how they can change their own shop and how they do business, and listen to the fact that you may not be efficient, what a better world IT would be…it just may be that you could be doing things a lot better and saving your company money.”**

*--IT Director, large insurance firm*

**“It’s the value proposition of the IT initiatives and the portfolio. What’s the business getting back from its IT investment, and how are we making sure that we’re getting that value? It’s easy to do a traditional ROI, and the financial guys, the bean counters, they can manipulate ROI if they’re good finance guys.”**

*-- IT Director, large networking vendor*

The drive to curtail the costs of managing the firm’s IT infrastructure is not new; however, the boost the CIO’s budget received from Y2K initiatives and the generally free-spending days of the past few years lulled many into operating patterns that do not reflect present realities. The CIO is under increasingly intense pressure to overcome a general attitude of “you had your turn” and is likely to witness some lean years ahead. This translates into the need to run the IS department as a business, with procedures and controls in place to manage costs and demonstrate return on investments (ROIs). The CIO must be managing this infrastructure in a proactive, cost-maintenance manner, while at the same time delivering more services more effectively.

Other issues are efficiency-related and may often be measured with traditional business metrics. The IT group in any enterprise is under increasingly intense pressure to become a profit-generator rather than a cost center, and it must find ways to justify its existence in terms of ROI and levels of service. The daily operations of IT must be based on the continued need for the delivered services, the quality of those services and the market competitiveness of the IS organization in delivering those services.

Why should a company use an internal IT unit rather than best-of-breed outsourcers, for example? IS organizations are under mounting pressure to deliver reliable, flexible and effective IT services—and to do so more quickly and cost-effectively. “The question is, how accountable are we holding the business that’s sponsoring the IT initiative—one that says, ‘Oh, we’re going to increase productivity by ten percent,’” states an IT Director for Customer Advocacy at a networking firm. “And how accountable are we holding the IT department to deliver that improvement in a partnership? And are we really getting the value out of IT that we need to?”

To address these questions, Gartner believes that by 2006, IS organizations that fail to adopt competitive, service-based business management principles will lose at least 50 percent of their core functions to external providers (0.7 probability). How can CIOs convince their board of directors that their approach to IT will generate a better return?

The present realities will require that the CIO manage resources in an optimal manner—in other words, like a business. There must be a constant drive to increase operating efficiencies, effectively utilize human resources, and be as transparent to the operations of the firm as possible. How work is done will become as important as what work is done. Processes will need to become standardized, and where possible, automated. The CIO will need to have continuing access to the status of the IT infrastructure, the ability to manage change—on both a project and a strategic scale—and the ability to measure effectiveness in real time.

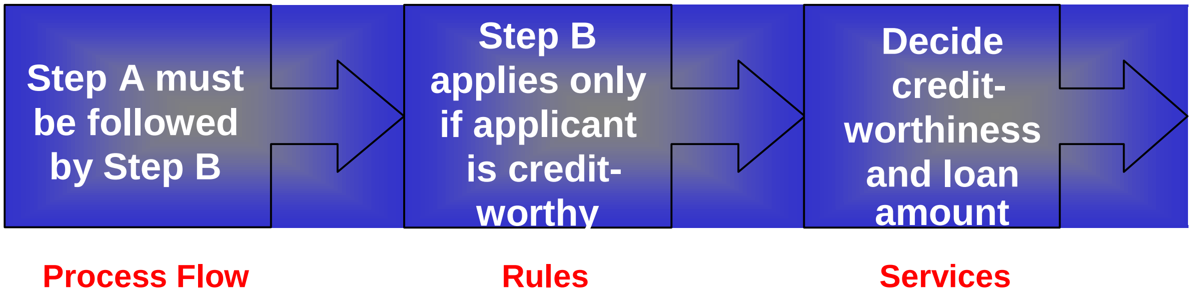
While efficiency is very important to today’s CIO, it is important only within the context of business strategy. IT organizations must resist the traditional urge to manage themselves as a mere utility. Efficiency campaigns should result from strategic business goals in some cases, and drive them in others, but effective and viable efficiency initiatives will never be divorced from larger business objectives.

## The Culture of the Explicit Process

A good bridge for solving these problems facing the CIO is a consideration of process. From an enterprise and an IT perspective, efficient business processes are becoming a real competitive advantage for those who make them consistent and easy to use. As new capabilities for process representation emerge, enterprises are requiring a cultural shift to embrace explicit process methodologies. Gartner analyst David McCoy describes this trend by pointing out “...the culture of the explicit process.”

Processes were originally created as tasks for people to perform. People managed the process flow, the rules and the services (see Figure 1).

**Figure 1. Process Flow, Rules and Services**




Later, automated processes replaced human ones, and COBOL code, for example, enabled a runtime system that encapsulated flow, rules and services.

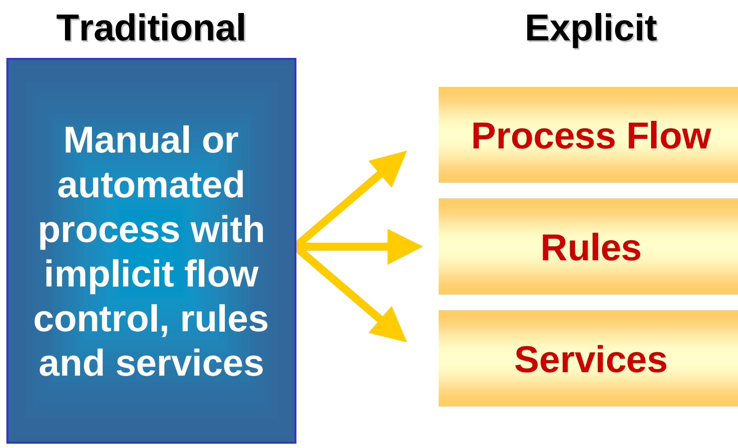
The same principles applied for automated processes—process knowledge was encoded into the systems doing the work, but the systems in this case were computers instead of people. This encoding of process knowledge led to greater repeatability, consistency and productivity, and led in many cases to competitive advantages for those who mastered the encoding.

The problem with both of these advances, as wonderful as they were, was that process knowledge was often tightly bound to the process performers, whether they were people or machines, so that the rules, services and flow became difficult to review or change. Knowledge about the process, implicit in the manual series of steps remembered by the performer or the computer program, often became separated from the process design (e.g., the thick, three-ring binder on the bookshelf for the human processes, or the program documentation for the automated processes).

In this traditional, implicit paradigm, process changes were painful; people had to unlearn process steps they had internalized and relearn the modified process, while programs had to painstakingly be recoded. This world of retraining and systems maintenance did not come without its price—downtime, opportunities for error, and on-the-fly, piecemeal process patching.

An explicit process, on the other hand, maintains a strong link between the process design and the process implementation. The big difference is that the explicit process treats process flow, business rules and services as distinct, layered entities. This concept takes business application logic (see Figure 2) and splits it into three logical components that may be supported by distinct technologies such as rules engines, process managers and Web services.

**Figure 2. Components of Business Application Logic**




The explicit approach can be modified and maintained at the exposed layers. The process map can be altered, the rules can be changed and the underlying services can be replaced or extended, all without the complexity and expense associated with the recode/recompile process.

This explicit process model has profound implications for the CIO and for the solutions to the CIO's problems. The next section will describe how the IT process maturity framework interacts with the explicit process concept, and how the resulting combination may suggest answers to the CIO's strategic IT process challenges.

# IT Process Maturity

## A. The Five Levels of IT Process Maturity

One useful way to evaluate the effectiveness of an IS organization's IT processes is to consider how mature they are. The following five-level IT process maturity model provides a framework for determining how well IT processes drive efficiency and value.

### Level 1—Tactical, Investigating and Attempting Change

This level is the first one an IS group must reach as it attempts to make sense of its processes. At this stage, processes are largely implicit, and experts with tacit knowledge solve specific problems. Level 1 is, of course, the most minimal of all possible IT process worlds. At Level 1 some monitoring occurs, and reliance on problem reporting is augmented with process monitoring. When a problem occurs, IT management calls in an expert who relies on tacit expertise to come up with a solution. At this level, repeatability is still uneven, unless the troubleshooter is called upon repeatedly. Tacit knowledge at this level remains tacit, rather than explicit. Business processes remain static, and problems are rarely anticipated. This is the lowest level at which an IT organization performs well enough to survive, and many organizations are at this level.

## Level 2—Management, Automation, Repeatable

At this level, the enterprise consciously converts tacit knowledge to explicit knowledge, and processes are implemented to circumvent potential problems. Enterprises get to this level when they realize that an explicit and disciplined approach will outperform an unstructured and chaotic one. They also realize that the old adage still stands—you must be able to measure IT to manage IT effectively. Among the processes that may be implemented at this point are the following:

- **Problem management:** enables tracking and quick resolution of problems, as well as root cause analysis to avoid similar problems in the future
- **Change management:** to better plan, coordinate and schedule application and IT infrastructure changes, thus enabling improved quality of service
- **Performance management:** enables trending of performance parameters to predict short-term future performance degradation (e.g., where performance parameters are outside the baseline) and assists in quicker problem diagnosis
- **Availability management:** enables the correlation of performance and other system, network and application parameters to predict, and thus avoid, potential downtime; includes using automated tools to avoid problems and improve job scheduling to help reduce operator errors and approve the overall availability of batch applications and data
- **Configuration management:** enables the understanding of relationships between IT infrastructure, applications and business process components; is also an underpinning of problem, change and availability management.

At Level 2, end-user services are identified and classified as to their criticality, thus enabling greater management effectiveness and efficiency. Also at Level 2, IS groups transform themselves to process-based entities.

## Level 3—Service-Level Management

This level enables IS organizations to define IT services and begin measurement, while adapting IT processes to optimize them. IS organizations that ascend to Level 3 concern themselves, in conjunction with business units, with defining IT services and measuring them, which progressively leads to SLAs. Using explicit processes as tools, IS organizations often break service objectives into sub-objectives; these sub-objectives are used to measure external SPs' and internal IS providers' performances in meeting the broader business objectives. Setting formal service objectives requires confidence they will be met, necessitating all proactive Level 2 processes.

Fewer IS organizations perform at this level than at Levels 1 and 2. Level 3 is a great leap forward in process maturity.

## Level 4—IT and Business Metric Linking

After a Level 3 company has thoroughly studied how IT affects broader business objectives, the next logical step is to move to Level 4, wherein business metrics are linked with IT metrics. A Level 4 enterprise can use data from both management and business applications to audit the efficiency (e.g., employee productivity and cost) and effectiveness (e.g., customer satisfaction) of established business processes. This results in improvements to, or the addition of, new IT processes to address previously unclassifiable problems. In other words, processes are continuously optimized, and new processes are routinely made explicit. Only a small number of enterprises have reached Level 4, so reaching it will confer clear market differentiation.

### Level 5—Fusion

At Level 5, IT and business processes merge and become indistinguishable. IT processes help drive business strategy, and IT and business processes reinforce mutual overarching goals.

Level 5 is very rarely present in today's enterprises. At this stage, processes are part of the company DNA, and they no longer must be placed in business or IT silos. They burrow into the company's collective consciousness, and they make for innovative ways of viewing the marketplace.

One financial services company has taken steps to reach the "fusion" stage. This company, which helps link investment houses and banks in Europe, took all of its technical manuals and shredded them, and then added Expert System capabilities, so that when lines went down, manuals to fix the specific problems were automatically generated, based on answers to questions by technicians, as well as electronic information.

With IT supporting the business in all senses, where processes and business goals are aligned, IT goes away. It becomes part of the business. This automated IT process brought the financial services company closer to its customers and focused it on revenue generating opportunities it would otherwise have been unaware of, all because it captured the IT related problems of its users.

## B. Metrics—Measuring IT Process Effectiveness and Efficiency

The five-level theoretical framework outlined above may be useful, but it does not outline some basic ways to measure how efficient and effective IT processes are for an enterprise.

Efficiency, or cost, metrics are those that measure how cheaply and quickly processes are executed. As stated earlier, IS departments are under intense pressure to prove that they are running hyper-efficient shops, and the best way to provide such proof is to use metrics. For an overall IT organization, such metrics center around cost of production, IS budget as a percentage of revenue and IT spending as a percentage of expenses. Each IT function has its own associated specific metrics, all of which contribute to the holistic IT efficiency picture.

Effectiveness metrics, those that show how well processes work and how much associated value is produced, are a bit tougher to get at. Such things as throughput and time-to-market, however, are good value barometers for IT processes. As organizations ascend the process ladder, value becomes more measurable, especially regarding new and incremental revenue produced. In the previously described Level 5 of IT process maturity, revenue is a direct reflection of IT effectiveness.

One company was faced with the challenge of improving operating efficiencies and reducing costs while at the same time achieving faster time to market. The company understood that its existing metrics did not permit any meaningful measurement, and revamped how it segmented its IT portfolio and applied business related metrics where appropriate. These metrics included time to market, rework and cycle time. The effect was to generate business-related feedback, not just numbers.

Another company, a bank, understood the need to align IT with business needs. It introduced the balanced scorecard approach, but carried it one step further than most. Instead of stopping at the departmental level, it drove metrics down to the individual level. Now, individual performance is measured against contribution to business goals and is rewarded accordingly. This bank understood that being efficient was not enough if employees were not driven by business outcomes.

There is also such a thing as generating metrics for their own sake, which must be guarded against. One firm, lacking meaningful processes or metrics, determined that the path to success lay in ISO 9000 certification. It created a dedicated task force to generate ISO-approved processes. While certification was achieved on the strength of documentation, the process fell apart soon afterwards from the weight of excessive documentation and the lack of commitment to real process improvement.

**Table 1. Summary of IT Process Maturity Model**

| Level | 1<br>Reactive | 2<br>Proactive | 3<br>Service | 4<br>Optimal | 5<br>Fused |
|---|---|---|---|---|---|
| Attributes | Tactical, Investigating and Attempting Change<br>Experts with tacit knowledge solve specific problems | Management, Automation, Repeatable<br>Enterprise converts tacit knowledge to explicit knowledge | Service-Level Management<br>IS organizations define IT services and begin measurement; adapt business processes to optimize them | IT and Business Metric Linkage<br>Data from both management and business applications used to improve business processes, with a well-defined and regular process for updating and maintaining its operational set of business processes | Cutting Edge—What's Coming Next:<br>IT and business processes merge and become indistinguishable<br>IT processes help drive business strategy<br>IT and business processes reinforce mutual overarching goals |
| ***Metrics*** | ***Description*** | | | | |
| **Cost** | Metrics center around cost of production; IS budget as a percentage of revenue; IT spending as a percentage of expenses | | | | |
| **Value** | Metrics center around value produced, including such things as throughput and time-to-market. As organizations ascend the process ladder, value becomes more measurable, especially regarding new and incremental revenue produced. | | | | |

# The Process Provider Landscape

Effective explicit processes are crucial, then, to business and IT success. As more enterprises realize this, the next set of questions revolves around which vendors to select. In Table 2, we have placed a representative sample of leading vendors in six silos that represent groupings of related processes.

**Table 2. Leading Vendors Grouped by Process**

| | Help Desk | Application Development/ Change Mgmt. | Business Process Mgmt. | PSA/ Portfolio Mgmt. | Project/ Program Office Mgmt. | Integrative IT Process Mgmt. |
|---|---|---|---|---|---|---|
| VENDORS | Remedy<br>Peregrine<br>PeopleSoft (Vantive) | Computer Associates<br>Merant<br>Rational<br>Telelogic<br>Serena | IBM<br>Vitria<br>Tibco<br>Fuegotech<br>Savvion<br>Accelio | Evolve<br>Changepoint<br>Novient<br>Niku | Primavera<br>Business Objects<br>PlanView | Kintana |

It is instructive to note that the process silo in which each vendor appears is not necessarily the only one handled by that vendor. Several of these vendors are attempting to broaden their horizontal reach across these silos, either through acquisitions, partnerships, product development, or some combination of these. Clearly, however, each vendor has specific strengths from which it launches new initiatives.

With that said, it becomes important to understand how an organization that wants to rationalize its processes and make them explicit can make these processes work together to add true value to the enterprise. As complexity increases and agility is needed, the various pieces of the process puzzle must converge at Level 5 of IT process maturity. If the goal is to make best-of-breed process applications work together seamlessly to drive business value, IT groups can take a number of different approaches.

**The first approach that enterprises might use is the people-centric method.**

Enterprises have for decades been using people to direct traffic among applications, manually plugging in and using processes when appropriate, and routing to other processes as needed. In many organizations, this person is an IT project manager or process analyst.

The manual paradigm has some drawbacks. First, process knowledge often remains implicit, and processes lose efficiency as different people introduce different biases. Perhaps the traffic cop subconsciously favors traffic that flows from left to right, so drivers traveling in that direction receive favorable treatment.

Staffing is another problem here. These days, skilled traffic cops are difficult to find, and they command top dollar. As IT project managers leave their positions and replacements must be found, replacing the lost implicit process knowledge is extremely difficult. In this situation, process efficiency and flow rarely improve meaningfully.

**The next model is the integration/reintegration paradigm.**

Rather than relying on people to perform traffic direction, enterprises using this approach construct a static process-flow system in much the same way that a municipality might put a series of traffic lights and stop signs at key intersections. Systems integrators perform these duties for enterprises today with the goal of making process traffic move efficiently through intersections.

This approach also has systemic limitations. As process applications change and mature, traffic patterns change. Even if the integration was optimal for the time it was done, times change quickly for IT departments. As process applications change, so must the interfaces between applications. If a stop sign is causing an unnecessary traffic bottleneck, someone must physically come in and remove it. If a new neighborhood is built that causes a street to become busier, someone must decide how to handle the troublesome new traffic issues.

The same thing is true of the integration/reintegration model. As the infrastructure changes, processes become more sub-optimal and inefficient. New applications require new integration, and integration is expensive. Enterprises often must choose between the slow bleeding of inefficient processes or the large systemic disruption and expense of reintegration. There is a tradeoff between cost, robustness and efficiency. To achieve a low-cost solution, designers need to allow for looser tolerances. These may imply slower response, higher cost or more variability. Custom solutions can be tuned, but only at the cost of increased support costs to continue to tune for the system's changes.

**The third way of handling process flow is to mesh the multiple parallel processes through automated interface**s.

Consider a multi-modal transport system as an example. If pieces of freight are to be transported with maximum efficiency across continents and across oceans, various processes must be used, including trucks, railroad, air travel and boats. These transportation processes are interdependent: if one is late, they all are, and if their schedules are not meshed, the system falls apart. If their schedules cannot be adjusted on the fly, everything is thrown into disarray, and many pieces of freight are made late or are lost.

The same is true of IT processes. They should be able to work in parallel with each other, joining and synchronizing when business rules dictate, then splitting. Multiple departments within an enterprise should be able to own these processes so that they drive business value maximally.

The optimal solution for companies who want to make their multiple parallel processes explicit and fused with their business is to find a vendor that will automate the ways that processes work together based on business rules. Such an automated system would be dynamic, and capable of changing with the components to create seamless process flow. Such a system will drive down labor expenses and integration costs over time, leading to a lower total cost of ownership and a higher ROI, as well as to a more efficient infrastructure. All of these benefits enable a CIO to make IT run as an efficient, provably-profitable business.