Managing information technology in a new age

Key Topics

Keeps pace with the new purpose and structure of IT

Describes a dynamic, flexible IT management construct
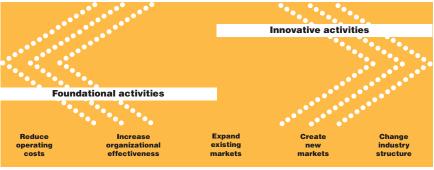
Incorporates techniques to help manage IT effectively

Satisfies speed-to-market requirement for new services

Provides solid guidance for new and existing management structures

Information technology (IT) and business, always closely intertwined, are now becoming virtually inseparable. While maintaining their traditional role of increasing organizational efficiency and effectiveness, IT departments are now often required to lead businesses into new industry structures and markets, most recently e-business initiatives. In fact, a recent study conducted by The Economist Intelligence Unit, called "Assessing the strategic value of information technology; planning perspectives for Sr. Executives," (February, 1999), indicates that an increasing number of business executives plan to leverage their IT investments and balance their IT goals toward allocating technology investments to programs aimed at reaching new markets or changing industry and market practices, as opposed to using technology simply for efficiency or effectiveness purposes.

Realizing the value of information technology

| Reduce operating costs | Increase organizational effectiveness | Expand existing markets | Create new markets | Change industry structure |

(Chart 1)

Because IT systems are also the production line of today's online business, IT failures are now business failures, suggesting the need for more rigor in IT management. Clearly, the management of IT is no longer solely an IT issue—it is a business management issue of great interest to CEOs and CIOs alike.

e-business

To assist companies in leveraging their IT investment, IBM has developed an IT Process Model™ designed to relate to today's management issues. It is a model that helps companies develop a planned, defined and communicated IT management structure to align with the style, needs and culture of the organization. Because achieving a satisfactory return on IT investment is a critical success factor for businesses, the IBM IT Process Model is useful in linking IT strategies to the overall business strategy of the company. The IT Process Model provides the structure for defining organizational objectives and planning a strategy to achieve them. The IT Process Model is dynamic and flexible, capable of adjusting to a wide variety of environments, and it has depth and scalability to apply to most organizational needs.

Keeping pace with the new purpose and structure of IT
IT environments today are dramatically different from the host-centric systems of 20 years ago. Today, IT systems span complex networks with multiple access points and servers, hundreds of software components and thousands of computing devices.

With the introduction of distributed computing and client/server technology in the 1980s, many organizations abandoned a centralized IT decision-making unit. As a result, many IT environments have broken into multiple management entities that focus on the IT needs for each specific area of the company. While there are some advantages to such an organizational construct, this can suboptimize the benefits from the total investment in IT.

Today, businesses recognize the value of leveraging a consistent application of technology across the entire organization. In addition to their area-level responsibilities, individual IT domains must also interoperate with each other to meet common goals. Moreover, key corporate assets—such as databases and networks—need to be maintained in standard, centrally controlled repositories to improve accessibility and derive maximum benefit for the organization. Critical business disciplines, such as security and disaster recovery, also strongly suggest centralized IT control. However, decentralized IT structures can add an improved overall customer support element—smaller, area-focused IT teams are often more equipped to provide efficient, timely customer service.

Clearly, businesses face the challenge of balancing centralized versus decentralized control of their use of technology. Companies need a customized IT management model that not only provides a consistent approach for solid decision making, but one that also supports technology progress and streamlines information flow.

Satisfying speed-to-market requirement for new services

Too often, organizations launching e-business initiatives resist implementing a structured IT management system under the belief that such rigorous structures impede their ability to react to the fast-paced world of e-business. These companies consider speed to market the most important criterion for introducing new services. However, companies that lack a solid IT infrastructure, including a rigorous IT management system, hastily entering the market first, also expose themselves to the risk of failing first. To date, markets have not proven tolerant of service delivery failures, regardless of the whether the cause was a technology or business process failure.

In reality, a properly designed and implemented IT management system can move much faster than traditional hierarchical command-and-control models. Part of the increased efficiency of structured IT management is due to the control designed into the process. This control is typically found in the form of policy statements which guide, rather than simply restrict. Instead of waiting for a decision to move up and down the management control structure, process-centric organizations empower each team with the authority to act without involvement from senior management for normal operations, confident that process policies will provide the necessary guidance. Senior management exerts its influence proactively, assisting in developing the principles and policies that will ultimately govern the final IT management system. The end result is a finely tuned IT management system that fosters timely, consistent decisions aligned with aggressive time-to-market objectives.

Providing solid guidance for new and existing management structures

While the IT Process Model often serves as the basis when creating new management systems, this model can also help organizations understand and assess their current management approach.

IBM has already assisted numerous organizations using the IT Process Model. Specifically, organizations can use the model to:

- *Integrate processes from multiple divisions into a consistent structure*
  A large financial services firm with several dedicated IT organizations used the model to integrate the disparate change management processes that existed among its business units. IBM has also used the IT Process Model to help companies consolidate their IT environments following corporate mergers or acquisitions.

- *Identify the strengths and weaknesses of current management structure*
  IBM has used its model as the foundation for performing assessments across a wide range of industries, including manufacturing, utilities and government. For example, a European bank used the model to prioritize improvements to processes managing the company's distributed branches.

- *Identify roles and responsibilities when outsourcing IT projects*
  The IT Process Model describes the set of activities which need to be performed to manage IT, irrespective of who is going to perform those actives. Because of this feature, the model is well suited to help determine roles and responsibilities in environments with multiple suppliers. For example, IBM consultants used the model to help a large utility establish roles and responsibilities following the outsourcing of its mainframe operations. Because the model suggests the information flows among the various activities described, the information flow between retained IT management functions and outsourced functions can be more readily defined.

- *Prepare existing IT infrastructure for an e-business launch*
  Companies can use the model to perform periodic reviews on their IT management structure, ensuring that new technologies are managed with the same rigor and discipline as were previous system applications.

Utilizing a dynamic, flexible IT management model

After six years of proven success, the IBM IT Process Model focuses on core IT activities, rather than the technical details typically associated with how IT is managed. By providing a structure for assignment of the IT functions and responsibilities within a business environment, the IBM model enables companies to establish a solid foundation for their IT management system. This structure can be applied at any implementation level, including e-business initiatives.

The IT Process Model can serve as the foundation for an organization's design, communication, analysis and assessment objectives. IBM designed the model for easy customization to fit differing business and IT environments.
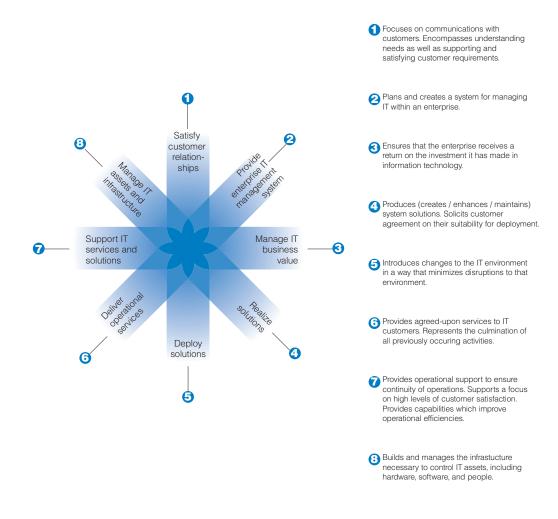
Specifically, the model is:

- Independent of specific organizational structures, architectures or technologies

- Independent of the size of the enterprise

- Flexible to address specific cultures and technologies unique to the organization

- Comprehensive and customer focused.

Incorporating techniques to help you manage IT effectively

While the eight main components of the IT Process Model that follow are presented in a logical order for simplicity, there is no mandated sequence of events. In practice, the components are so closely intertwined that many can and do occur simultaneously. In addition, as these components are discussed, there will be references to the "IT department" or "IT division." This does not imply that there must be a single organizational entity responsible for IT services—quite the opposite. This reference is to anyone within the enterprise who contributes to the delivery of IT services, regardless of the reporting structure and is used for simplicity.

The eight components for managing IT effectively are to: Satisfy customer relationships, provide an IT enterprise management system, manage IT business value, realize solutions, deploy solutions, deliver operational services, support IT services and solutions and manage IT assets and infrastructure.

❶ Focuses on communications with customers. Encompasses understanding needs as well as supporting and satisfying customer requirements.

❷ Plans and creates a system for managing IT within an enterprise.

❸ Ensures that the enterprise receives a return on the investment it has made in information technology.

❹ Produces (creates / enhances / maintains) system solutions. Solicits customer agreement on their suitability for deployment.

❺ Introduces changes to the IT environment in a way that minimizes disruptions to that environment.

❻ Provides agreed-upon services to IT customers. Represents the culmination of all previously occuring activities.

❼ Provides operational support to ensure continuity of operations. Supports a focus on high levels of customer satisfaction. Provides capabilities which improve operational efficiencies.

❽ Builds and manages the infrastucture necessary to control IT assets, including hardware, software, and people.

Satisfy customer relationships

A successful IT management structure must have a solid set of processes in place for interfacing and communicating with customers. By establishing a good rapport with customers, IT organizations can improve all forms of customer interaction including translating customer requests into solutions, delivering services and support, and assessing customer satisfaction.

To satisfy customer relationships, those who deliver IT services need to:

- *Understand and document customer needs/requirements*
  The IT team is constantly collecting and interpreting requests from customers for new or revised solutions. After translating requests into requirements, the team formulates a solution proposal and presents this solution to the customer base. This proposal may require additional iterations as more depth and input from customers help shape the final documented solution.

- *Market offerings and capabilities*
  Successful IT departments understand the business environment in which they serve, identify key customer groups that would benefit from new or unique IT services, and market specific solutions and capabilities to these groups. Effective IT organizations advertise their services to general and specific audiences alike; communicating potential solutions as well as current offerings.

- *Administer service levels*
  A clear statement of service-level requirements is one of the basic parameters to design and deploy satisfactory solutions between IT and its customers. The IT service agreement joins customers' goals with the negotiated solution stated in clear, measurable business terms.

- *Provide operational support to the customer*
  All operational concerns between the IT provider and the customer should come through a single point of contact—whether from the customer to the IT provider or vice versa. This set of activities establishes clear lines of communication between those providing IT services and those who use them.

- *Manage customer satisfaction*
  Monitoring customer satisfaction is critical to delivering quality IT service. To manage customer satisfaction, effective IT departments should identify the factors that can maintain or improve satisfaction, understand what satisfies or dissatisfies the customer, determine appropriate measurements and analyses to evaluate customer satisfaction and implement action plans to improve satisfaction throughout the customer base.

Provide an enterprise IT management system

In order to achieve maximum leverage from IT investments, corporations need to centralize authority for making some key technology decisions. At the same time, IT delivery functions within divisions often define a system for managing their own departments. They use their own culture and environment to guide their IT management approach, relying heavily on corporatewide norms established by the centralized authority such as values, vision, goals, financial objectives and guiding principles. This centralized authority can be a 'real' or 'virtual' organization, made up of leaders spread throughout the company, but its influence must be consistently applied throughout the enterprise.

When developing an enterprise IT management system, those responsible for an organization's use of technology must first define the component parts of that management system (represented by the rest of the IT Process Model). They must then assign ownership and authorities associated with those activities, finally integrating them into a comprehensive IT management system for the enterprise.

- *Establish the system construct*
  First, consideration must be given to any influencing factors that apply to the corporate environment as a whole. The team must understand its customers' business objectives, and then align the guiding IT principles with these goals. Effective IT management system structures should also include cultural and business aspects, such as vision and corporate values.

- *Plan the system*
  After selecting the overall management structure for the IT component of the enterprise, the team plans and develops the IT management system guidelines. When doing so, the IT team considers the factors that indicate how well its current management system is working, including customer satisfaction, budget value and goal attainment. Also, the team determines other techniques that will be implemented in the IT management system, such as any project, value, process and system management models. The team then applies these influencing variables to the definition of process activities, and assigns specific roles and responsibilities.

- *Evaluate the system*
  Once the enterprise IT management system is in place and active, successful organizations measure all relevant processes and evaluate how well the overall IT management system is functioning. The goal is to improve the current management approach.

Manage IT business value

Those who deliver IT services should not attempt to operate independently of the rest of the corporation. They should exist within their parent corporations and conform to the business direction, financial goals and underlying principles inherent in the enterprise.

By establishing a clear understanding of the business-value plan, those responsible for delivering IT services can better manage current goals and promote future initiatives. By understanding overall business objectives, senior IT management can better understand their role in achieving those objectives. They can, in turn, suggest to senior business managers how IT can contribute to the attainment of business goals. In some cases, IT capabilities can even help alter those goals.

When developing a value strategy, IT departments should focus on the value they bring to the company and consider how their function is aligned within the business. The IT team should also consider IT resource planning and control, such as prioritization of customer requirements, the contents of its offerings portfolio, enterprise architectures, resources, standards and policies.

To discern the value of IT to the customer's business and develop an effective plan, the following process activities should be performed by those responsible for IT service delivery:

- *Establish IT value*
  The team works closely with their customers to establish IT's value to the organization's business and appropriate measures to determine if that value is being delivered.

- *Conduct research*
  These activities are aimed at sensing the direction technology is moving within a given industry, as well as across multiple industries. For example, IT departments in the shipping industry have adopted the retail industry's bar code technology as a method for item tracking purposes. Depending on the value proposition, which bounds the scope of research activities, this set of activities can also help identify ways in which technology can be applied to increase the corporations competitiveness and/or identify new market opportunities.

- *Develop IT strategy*

  Effective IT departments encourage a representative to actively participate in the development of the corporate business strategy, helping ensure that the IT strategy is aligned with overall corporate direction. If the enterprise has adopted some form of 'sense and respond' approach to strategy formulation, for example, it is vital that the IT strategy be as flexible and dynamic as possible so it can adapt to new business requirements. In many cases, having a flexible IT infrastructure can determine how quickly a company can act on a new business opportunity.

- *Justify offerings and infrastructure portfolio*

  A tactical and strategic planning function should validate current IT offerings and infrastructure, as well as confirm the justification for new offerings and infrastructure. These activities examine the business case for both business application and infrastructure investments and provides recommendations on the overall prioritization of projects.

- *Define IT architecture*

  A key element to the successful use of technology is to define, and consistently apply, an overall IT architecture. This architecture should identify critical building blocks, or components, required for the delivery of services, which are to be deployed throughout the company. In addition to the list of IT components, the architecture should include implementation guidelines to establish conformance throughout the organization.

- *Develop and track the IT plan*

  When developing an IT plan, the objective is to control resources within the tactical time frame to ensure resources are applied to those activities which provide maximum business value. A successful plan focuses on short-term goals that support strategic objectives, resource requirements and allocations, budgets, and IT measurements, while at the same time, preserving resources to work on more strategic infrastructure development projects. This plan should also be periodically reviewed to help ensure that goals are being met, and if necessary, altered to adapt to changing priorities.

Realize solutions

One of the key functions of IT is to create, enhance and maintain technology solutions throughout the organization. Creating new solutions may be done through any combination of internal development, purchasing or subscription. However, solutions should be produced in a prioritized, project-driven environment, based on customer requirements. Those responsible for IT services must provide a suitable construct for both developing new solutions as well as enhancing and/or maintaining existing ones.

The IT team must assume responsibility for a broad range of system integration activities, including hardware, software and network components, applications development and other modifications to the computing infrastructure, as well as business systems.

To identify and develop solutions, the IT division must:

- *Understand solution requirements*
  Successful IT teams validate that they understand customer requirements prior to beginning the design phase and revalidate them throughout all subsequent phases.

- *Design solutions*
  Within this set of activities, IT departments translate project requirements into system designs which conform to the enterprise architecture. Once the solution design is validated, baseline plans and commitments are created.

- *Construct and integrate solutions*
  During this process, the team acquires or builds components to meet system-solution design specifications and then integrates these into the final, deliverable solution.

- *Test solutions*
  Prior to deployment, the IT department tests individual components, the integrated solution and finally the revised system to help ensure that the end product meets design specifications and quality standards. These activities are also used to stress test the solution to determine the point at which the solution will no longer deliver the desired performance or function.

- *Gain customer acceptance and certification of solutions*
  Before deployment, the team introduces the solution to the customer base and obtains agreement that the solution is correct, complete and ready for end-user implementation.

Deploy solutions

Once the final IT solutions are ready to deploy, the next process involves introducing the change into the existing IT environment with minimal disruption. Whether completed manually or through automation, the change process must be uniform for software, hardware, control mechanisms, configurations, environments, facilities, databases and business applications. A controlled change process is fundamental to the effective execution of many other IT functions, including customer support, problem management, operations management, asset management and security.

The rigor applied to the change process should be a function of the risk to the business systems affected, more so than the complexity of the technology—even minor changes to vital business systems should be closely monitored. A managed process for deploying IT solutions is important to distributed, LAN, e-business computing and client/server environments as well as large, mainframe environments and should be consistently applied throughout the enterprise. An IT change management process should define all tasks associated with change activity, including assignments, scheduling, approval, distribution, synchronization, installation, monitoring and activation.

When deploying solutions, the IT division:

- *Defines change management practices*
  The first step to develop a change management process is to define and establish the environment within which all solutions will be deployed. The IT team then determines standards, guidelines and responsibilities for solution deployment.

  From time to time, the team should assess current change management practices to ensure that the current deployment process continues to meet expectations and goals, including the success rate of past changes and the impact of changes on the stability of business systems. The team should analyze change results as well as customer feedback to identify trends and possible ways to enhance the current solution deployment structure.

- *Plans the change deployment*
  The activities in this process include evaluating submitted change requests and then entering all accepted changes into a change management information base. These records become the basis for tracking change activity. The IT team evaluates an accepted request against existing IT solutions and commitments, and then processes the request as guided by change policies and procedures. If no existing solution exists which satisfies the change request, the change may be routed to the 'Realize Solution' set of activities to develop the solution.

  Once a requested change has been matched to a defined solution, the team plans the implementation, assesses the impact of the individual change requests, assigns personnel, defines phases and proposes a schedule. The level of review required for an individual change is determined, in part, by the degree of risk the change creates in the business system, as well as the technological impact to the IT infrastructure.

- *Administers changes*

  The IT department must develop a plan that coordinates all technology changes within the organization. In many environments, these coordination activities must also extend into the business process. The goal is to combine as many changes as possible to minimize business disruption, while at the same time isolating changes to minimize business risk. The IT provider tracks requests from receipt through completion and communicates the status and information on individual and aggregated changes.

- *Implements solutions*

  When implementing solutions, the IT provider distributes, installs and activates all approved changes. Timing is critical—individual hardware and software components necessary for the change should be integrated and tested before moving forward with the scheduled installation.

Deliver operational services

Operational services are the agreed-upon tasks the IT division provides to its end customer—they represent the culmination of all previous components of the IT Process Model. Many of these services include managing and executing operational activities, either through automated processes or manual tasks. These tasks can range from single transactions to multihour batch jobs running in a mainframe environment. They extend to responding to a customer request for access to a specific piece of software from a LAN server, or perhaps a request for deskside support.

Once a customer submits an operational service request, the IT provider identifies and allocates the resources required to execute the task and prioritizes it with the other tasks currently in the queue. Integration can happen immediately through an automated scheduler, or it may occur manually.

One of the key elements of delivering operational services is the creation of an IT service delivery plan—a planning vehicle that guides the activities responsible for overall service delivery. This plan mirrors the complexity of the environment and it may be as brief as a single, written sheet or as elaborate as a sophisticated online system. However, the service delivery plan is critical for small and large systems alike, as it describes what services will be provided to whom, under which conditions and during what time period.

When delivering operational services to customers, the IT team:

- *Enables service delivery capability*
  The IT team is responsible for establishing the structure for delivering services. The team develops the service delivery plan that explains audience for the service, its elements, where it needs to take place, when the service should occur and what resources will be required to deliver the final service.

- *Matches resources to commitments*
  When matching available resources to commitments, the IT provider:

  —Receives all requests for services, whether an incremental (e.g., increasing an existing or preauthorized service) or individual (e.g., discrete transactions) service request
  —Analyzes each request to determine appropriateness and resource requirements
  —Integrates requests and requirements into a work schedule
  —Verifies that each task has the appropriate security authorization for required resources
  —Commits the resources to each task.

- *Performs services*
  Here, the IT provider uses the appropriate combination of people and technology to deliver the requested service to customers. The deliverable may be electronic, manual or both. The delivery of services is monitored so that any potentially disrupting events can be identified and corrected before they have the potential to cause major impacts to critical services.

- *Sustains service delivery capability*
  In order to sustain its ability to deliver services, the IT department is required to perform certain housekeeping and maintenance procedures to ensure that resources can respond to future IT service requests. The department also monitors the delivery capability so it can provide base metrics and service usage data to other components of the IT management system.

Support IT service and solutions

In addition to resolving the ad hoc requests, the role of the IT support structure is to sustain day-to-day system services. Services include maintaining system availability and capacity, resolving system problems and providing users with up-to-date system status in terms of downtimes, configuration and performance. The IT team also identifies and implements ways to enhance the existing system to improve operational efficiencies, as well as ensures the continuation of IT services in the event of disasters.

Effective teams use the following guidelines for supporting base IT services.

- *Maintain configuration information*
  The IT provider is the primary information repository for corporate system infrastructure and configuration information. Therefore, it identifies the system configuration information to be maintained, establishing the information management system, collecting the configuration information, populating the database and then disseminating configuration information to other technical and administrative processes.

- *Manage availability*
  A critical component of the IT function is to identify availability requirements and determine appropriate actions to minimize the frequency and duration of both scheduled and un-scheduled outages. The IT department establishes availability projections, achievement measures and actions required to resolve availability exposures, both realized and anticipated.

- *Manage facilities supporting IT*
  Though facilities management is usually handled through a separate corporate department, IT management assumes an integral role in establishing, managing and administering the facilities required to provide the necessary environment for IT equipment and staff.

- *Manage backup and recovery*
  The IT team owns the process for planning, establishing, testing and implementing the backup and recovery procedures required to restore IT services to the organization. IT should also manage the process of identifying and providing alternate services in the event of a partial loss of system functions or data.

- *Manage IT continuity*
  IT providers are also responsible for developing and executing the plan to restore IT service in the event of a large scale disasters impacting large segments of the corporation. These technology plans need to be integrated into an enterprise business recovery strategy.

- *Manage performance and capacity*
  As well as maintaining system availability, the IT department also manages system response time, throughput and delivery requirements. The IT department first focuses on current performance requirements—measuring, analyzing, monitoring and tuning system components to maintain system performance to meet service levels.

In addition to current system performance, IT providers need to assess system growth needs, consolidate future requirements, track system use versus capacity and monitor service attainment. The process for capacity planning must be capable of identifying potential system constraints—measuring activity at critical points—and then determining what actions should be taken to help ensure future needs for IT services can be met.

- *Manage problems*
The IT department identifies, documents, analyzes, tracks and resolves problems as they relate to IT issues (e.g., IT questions or concerns, unsatisfactory production results) hopefully prior to any impact to business systems. Evaluating past problem history and developing historical trends are key activities to help improve future performance.

Manage IT assets and infrastructure

The business processes that are critical to the success of any enterprise management— finance, security, asset management, human resources, skills—are also important to an organization's IT management system. This management system must build, manage, and monitor all relevant resources including technology and people. In addition, the management system must ensure that corporate policies regarding security and privacy are maintained. Those responsible for IT service delivery must ensure that sufficient staffing and skills are available to accommodate all levels of technical configurations (e.g., individual parts, subassemblies, distributed components) and component types (e.g., hardware, software, printed documentation, architectures, designs).

When managing its assets and infrastructure, the IT department:

- *Manages IT finance*
IT management prepares and manages the IT financial plan to assist in maintaining maximum return on allocated finances. This includes determination of the most cost effective means of supplying IT services, including consideration of alternative suppliers and locations.

- *Procures services and components*
Through these activities, tools and components necessary for the delivery of IT services are obtained from vendors and suppliers outside the enterprise.

- *Prices offerings and administers customer contracts*
After developing specific services, IT providers may assign a cost to the solution and define the level of service included in the price.

- *Manages IT inventory and assets*
Effective IT teams document relevant information regarding all IT assets—including data, leased and purchased assets, licenses and physical inventories—from the time the asset is received or created until its retirement.

- *Establishes IT security*

  IT management is responsible for enforcing enterprise polices within the IT function and for the application of technology to assist with the implementation of these policies throughout the enterprise. They are responsible for the protection, confidentiality and integrity of IT assets, as well as the implementation of privacy policies. In addition, IT management must establish methods to capture unauthorized attempts to access protected enterprise resources under their stewardship (both logical and physical) and review these attempts for appropriate action.

- *Defines human resources*

  The IT division should have a personnel management system that conforms to enterprise personnel policies. This process defines techniques for hiring, conducting performance evaluations and developing employee skills within IT services.

- *Determines skills portfolio*

  When managing the skill sets, IT management determines whether a gap exists between required and available skills, and then manages the skills inventory accordingly. Management defines training or hiring requirements, and conducts appropriate training to develop skill levels and availability across both internal and external staffs.

Enhancing an organization's information technology asset

In summary, the IT Process Model represents the result of extensive research and an exhaustive assessment of the IT management approach across organizations worldwide. It focuses on the components of the structure, rather than the technology itself, so it can address issues in complex, heterogeneous, client/server and e-business environments alike.

Because IBM understands how key IT components link together, our IT Process Model is an essential tool for assessing, transforming and managing an organization's information technology asset. Perhaps the best testament to the value of the model is that it serves as the foundation for how IBM manages its own extensive IT operations.

For more information

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