

Developing and Implementing a Strategy for Technology Deployment

Successfully deploying information technology requires executive-level support, a structured decision-making process, and a strategy based on an understanding of the organization's vision and its enterprise architecture.

Colleen Shupe and Robert Behling

Understanding the strategy of the organization is a must for developing an effective IT strategy. If the IT strategy does not fit with the overall organization's vision, there will be constant conflict. Top leadership will need to invest valuable time in articulating the organizational vision and determining how IT will help with meeting and sustaining that vision.

While the organizational vision will drive the IT strategy, progressive-thinking leaders should also be cognizant of how IT strategy can influence the organizational strategy. Technology redefines opportunities and the choices executives make to exploit those opportunities and establish new capabilities. As a result, organizations are able to evolve current business models and, in some cases, build new ones.

Development of a strategic plan for technology begins with getting full support from appropriate senior management. This support begins with the

appointment of a team to develop the strategic technology plan, along with the appropriation of resources needed to develop the plan. This assures the organization that all interests are carefully considered during the planning process. It also strengthens the ability of the IT professional staff to gain cooperation among units within the organization during the development and implementation of the plan.

Technology awareness, use, and expectations can be found in varying degrees throughout the organization. The team charged with developing a strategic technology plan should comprise individuals representing all the

functional units of the organization. Participation in the planning process by these members ensures that the technology plan coincides with the mission and goals of the organization as a whole, takes advantage of resources throughout the organization, and meets the needs of operational staff.

Understanding the Enterprise Architecture

The alignment between business processes and IT is a major issue in most organizations, as it directly has an impact on the organization's agility and flexibility to change to meet business needs. The concepts upon which alignment is perceived are addressed in what today is called the "enterprise architecture," bringing business and IT together. Microsoft Data Network's "Enterprise Architecture Alignment Heuristics" describes the four fundamental components of enterprise architecture: business architecture, information architecture, application architecture, and technical architecture:

At the Core

This article

- ▶ Explains enterprise architecture
- ▶ Provides a model strategic plan for IT deployment
- ▶ Discusses elements of information security

1. Business Architecture

The business architecture is the result of defining business strategies, processes, and functional requirements. It is the base for identifying the requirements for the information systems that support business activities. It typically includes:

- The enterprise's high-level objectives and goals
- The business processes carried out by the enterprise as a whole, or at least in significant part
- The business functions performed
- Major organizational structures
- The relationships among these elements

2. Information Architecture

The information architecture describes what the organization needs to know to run its processes and operations, as described in the business architecture. It provides a view of the business information independent of the IT view of databases. In the information architecture, business information is structured in "information entities," each having a business responsible for its management and performing operations such as acquisition, classification, quality control, presentation, distribution, assessment, and so on.

3. Application Architecture

The application architecture describes the applications required to fulfill two major goals:

1. Support the business requirements
2. Allow efficient management of information entities

Application architecture is normally derived from the analyses of both business and information architectures and typically includes:

In preparation for developing a technology strategy, the following processes must be in place:

1. *Committed executive-level involvement* – IT supports management and operational strategies of an organization. Therefore, the IT strategy must parallel the organizational strategy and must be accepted by organization managers.
2. *A structured decision-making process* – This is necessary so that all issues are evaluated in a consistent manner, regardless of the application or functional unit being considered. Consistency in decision-making criteria is the only way an organization can be sure it is following the path to improvement through effectively using IT. It will also show that the IT department exists to support the organization as whole, not as discrete entities.
3. *An effective model for organization-wide communication* – One of the biggest mistakes an organization can make is to restrict input on the IT decision to the executive level. Two-way communication is critical for acceptance of IT decisions. Therefore, a structured process should be established to promote communication at all levels. The executive level is still responsible for making the final decisions. However, executives do not operate in a silo, and critical inputs from organizational members about how a decision will affect existing processes will contribute to the success of the overall strategy.

- Descriptions of automated services that support the business processes
- Descriptions of the interaction and interdependencies (interfaces) of the organization's application systems
- Plans for developing new applications and revision of old applications based on the enterprise's objectives, goals, and evolving technology platforms

Applications also have required attributes, such as availability (up time), scalability (ability to alter capacity and function to meet future needs), and profile-based access (ability to identify who does each task).

4. Technical Architecture

Technical architecture alignment is mostly dependent on the technology itself. This component is beyond the scope of this article.

Developing the Strategic Plan

After identifying the major architectural components from an alignment point of view, the relationships among these components should be addressed. Going through this process will make it evident where the organization is versus where it needs to be. People involved in these discussions should list what deficiencies are preventing the organization from achieving its overall mission and goals. It is only through a clear understanding of the organizational mission, objectives, and strategies that an effective technology plan can be developed.

The technology plan should be clear, concise, and understandable by non-IT professionals. The right level of details should allow enough flexibility so that the IT group will be able to adjust implementation details to meet changing needs and requirements without rewriting the entire plan. While each organization is unique, there are some general guidelines that can be followed when developing a strategic IT plan.

An IT strategic plan outline would include:

1. *Organization mission objectives and strategy* briefly describes the mission, objectives, and strategy of the organization.
2. *Information inventory* provides a summary of the various business processes, functions, data entities, and information needs of the organization. This inventory will define both current and expected future information requirements.
3. *Mission and objectives of information technology* includes a description of the primary role IT will play in the organization to transform the organization from its current to future state. While it may later be revised, it represents the current best estimate of the overall role for IT within the organization. This role may be as a necessary cost, an investment, or a strategic advantage.
4. *Constraints on IT development* briefly describes limitations imposed by technology and current level of resources within the company: financial, technology related, and human resources.
5. *Overall systems needs and long-range IT initiatives* presents a summary of the overall systems needed within the organization and the set of long-range (two to five years) initiatives chosen by the IT department to fill the needs.
6. *The short-term plan* shows a detailed inventory of present projects and systems and a detailed plan of projects to be developed or advanced during the current year. These projects may be the result of the long-range IT initiatives or of requests from managers that have already been approved and are in some stage of the development life cycle.

Outsourcing Decision Criteria

Consider outsourcing if:

1. The activity is not central to generating competitive success.
2. The job is a routine one that wastes valuable time and energy.
3. The task is a need that is only temporary or that recurs in cycles.
4. It is less expensive to have someone else do it than to do it in-house.
5. The activity can be done cheaper in-house, but it drains resources that could be better used elsewhere.
6. The skill required is so specialized that it is impractical to have a regular employee do it.
7. The activity isn't one that people enjoy doing.

7. *Conclusions* contain likely but not-yet-certain events that may affect the plan, an inventory of business change elements as presently known, and a description of their estimated impact on the plan.

Budgeting

Budgeting for technology should be treated as an investment, not an expense. As the strategic plan is developed and projects are identified and prioritized, estimated financial returns should be included to ensure the organization maintains profitability. To accomplish this, the organization will need to adopt a methodology for doing value analysis. While this is difficult in the ever-changing IT environment, an organization cannot set priorities without considering its financial constraints. Every organization has finite resources, and management has a responsibility to seek the best return for its technology investments.

Methodologies used in determining value are described below. Intangible benefits should also be taken into consideration when allocating funding for systems acquisition and development.

- *Cost-benefit analysis* is calculated to determine how well, or how poorly, a planned action is expected to turn

out. A cost-benefit analysis finds, quantifies, and adds all the positive factors. These are the benefits. Then it identifies, quantifies, and subtracts all the negatives. These are the costs. The difference between the two indicates whether the planned action is advisable. The real trick to doing a cost-benefit analysis well is making sure to include all the costs and all the benefits and to properly quantify them.

- *Net present value calculation* is useful when determining whether the total present value of a project's expected future cash flows is enough to satisfy the initial cost. The basic assumption is that money spent today has more value than money received in the future. So, future earnings or returns from an investment are discounted to provide meaningful comparison of cash flows for the acquisition or expense.
- *Return on investment* is the measure of the net income received from the new system to its total cost. Return on investment is calculated by dividing net profits by total assets.
- *Payback* is used to identify the time for an investment to be repaid by the revenue stream generated by the

investment. In this analysis, there is no consideration for the time value of funds, therefore no discounting of cash flows.

- *Value analysis* separates the benefits measured in terms of costs. The value of the benefits would be described with the intent of showing the decision makers an accurate picture of what they are getting along with the net present price.

Controlling IT Maintenance Costs

Controlling maintenance costs begins at the inception of a project through project identification, planning, analysis, design, and implementation. A significant portion of the expenditures for information systems is not incurred during the development of new systems; it comes during the maintenance of existing systems. There are four types of maintenance activities:

1. Corrective – changes made to repair defects
2. Adaptive – changes to evolve functionality to changing business needs
3. Perfective – making enhancements to improve processing performance and interface usability
4. Preventive – changes made to reduce the chance of future system failure

The majority of maintenance effort falls under corrective, which adds little or no value. Therefore, to mitigate corrective maintenance, carefully scrutinize system development life cycle methodology. Understanding maintenance costs and activities, and applying this knowledge during the system development activities, will lead to a system with fewer maintenance issues and associated maintenance costs.

Deciding Whether to Build or Buy

As the organization aligns IT strategy with its business strategy, it is faced with several options for procuring software:

1. Develop in-house
2. Use in-house system with vendor supplements
3. Choose best of breed
4. Customize a vendor system
5. Use selected vendor modules
6. Use a full vendor system
7. Use an application service provider

To determine the best option, the following steps should be taken:

1. Identify what needs the organization is trying to satisfy. This involves meeting with customers, vendors, suppliers, insurance providers, and business units to find out their specific needs and goals.
2. Separate these needs and goals into long-term, medium-term, and immediate.
3. Make sure that stakeholders agree with this assessment.
4. For each option, estimate how much time, effort, and money this will involve.

Managing the Project Portfolio

According to author Gary Bolles in the *CIO Insight* article “Technology: Optimization,” portfolio management is

critical for understanding the demands continually placed on IT. By providing a centralized and consolidated view of programs and projects, managers can evaluate and prioritize activities across the organization. Effective portfolio management makes it possible to maximize productivity, minimize costs, and keep activities aligned with strategic objectives.

To distribute risk outside the organization and ensure the staff always delivers IT services for the best possible value, organizations must not overlook outsourcing as a key part of the IT portfolio. However, before the decision is made to outsource, the staff must make sure it has squeezed all possible costs out of the operations being considered for outsourcing. Outsourcing offers the opportunity to speed up the development process, bring into play specialized technicians, and focus internal staff on critical and strategic applications. However, outsourcing also brings with it risks. Contractors may not be able to deliver what they promise, and the level of commitment is generally not as high as with in-house staff.

Addressing Security Issues

Security is a matter of degree rather than absolute. A single security measure in isolation will not likely be successful; therefore, an organization should evaluate and enact multiple defensive measures that meet its needs and goals.

Security Management Framework

Securing infrastructure involves design decision, operating policy and procedure development, and steely execution. The following principles of security management should be followed to protect data.

1. Make deliberate security decisions.
2. Consider security a moving target.
3. Practice disciplined change management.
4. Educate users.
5. Deploy multi-level technical measures, as much as the organization can afford.

Elements of information security include the following:

1. Security policies – Specify not only what people should avoid doing because it is dangerous, but also what people should do to be safe. Remember that this will be a living document and must be accessible to the people who are expected to comply.
2. Firewalls – Obviously, unauthorized access to the network must be prevented, but at the same time, external authorized access to those that need it must be provided. Therefore, a firewall must be constructed to facilitate legitimate interactions while preventing illegitimate ones.
3. Authentication – There must be a balance between a strong authentication policy and reasonableness. For example, the requirement for a password that is a combination of numbers and letters and that must be changed weekly seems to provide extra security, but because it will encourage users to write their passwords on paper, it will increase the risk of unauthorized system access.
4. Encryption – Modern encryption technologies are very good and provide a high degree of protection against the vast majority of potential attackers. By setting up encryption at both ends of a connection across public networks, an organization can extend its secure private network (virtual private network or VPN). This is crucial not only for communicating across public networks, but also within a single building hosting a wireless network.
5. Patching and change management – Keeping track of the variety of systems in an organization's infrastructure, security

weaknesses, available patches, and whether patches have been applied is a major task. Detecting a change in a file size or finding a file that should not be there would be an obvious sign of intruder activity. Best practice calls for keeping detailed records of all files that are supposed to be on a production system.

6. Intrusion detection and network monitoring – Intrusion detection and network monitoring work together to help network administrators recognize when the infrastructure is or has been under attack. Along with formal change management, which provides a baseline description of

the organization's system configuration, the information logged by intrusion detection systems can help quickly reconstruct exactly what an intruder did.

Evolving the Plan

Without a sound strategy, efforts will be wasted. No organization has the time or money for wasted efforts. Therefore, a structured methodology for developing a strategy will increase the likelihood for a sound plan consistent with the organization's goals. This plan should be a living document and on the top of executives' desks at all times, and its effectiveness should be evaluated and adjustments made to it annually. ■

Colleen Shupe is a software analyst for the Marshfield Clinic, Marshfield, Wisconsin, where she has worked for the past 10 years. She completed a MSIS from the University of Wisconsin – Oshkosh in 2006.

Robert Behling is a consultant to business, education, and industry, specializing in technology management and organizational behavior. He currently works with Arrowrock Technology, Chesapeake, Virginia, but for 26 previous years, he served as a professor of MIS at several universities. He holds a Ph.D. in business administration and is a Certified Systems Professional. He may be reached at behlingr@charter.net.

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