Payoff

Sound technology planning is vital to a corporation's health and well-being, especially as organizations cope with restricted budgets and smaller staffs. The adroit use of information technology can shoulder some of the workload burden, provided the deployment of IT is planned with specific projects and business objectives in mind.

Introduction

Corporations have been deploying information technology to meet business needs for many years now. Early computers used data entered into the computer via punched cards. Technology advances led to computers with networks of terminals for data entry and retrieval. With the introduction of the personal computer, many of the terminal networks have been replaced by networks of intelligent desktop workstations. Although each of these technology deployments has involved technology planning, the greatest need for technology planning appears to be in the intelligent workstation environment that has emerged in the past 10 years.

Intelligent workstations have been deployed, in some cases, because department managers decreed that everyone in the department must have a desktop workstation to improve efficiency. These departments spend thousands of dollars equipping employees with computer workstations, without planning exactly how those employees will use the technology to improve efficiency or how they will interact with the rest of the company. As a result, employees spend months trying to incorporate the new technology into their old work patterns. Such an implementation is not fair to either the technology or the employees.

The better method of deploying information technology is to employ careful technology planning for specific projects and objectives. This article discusses how to use the technology planning process as a tool for achieving business objectives.

Linking IT Architecture and Business Needs

Technology plans are carefully crafted tactical plans that use specific approved and supported components of the corporate Information Technology Architecture to meet defined corporate business needs. The information technology architecture (ITA) is a framework for linking technology components with long-term corporate business objectives and short-term technology plans. The information technology architecture (ITA) is maintained by the IS department, but with regular input from advisory boards whose members include both clients and IS personnel.

ITA components can include networks, workstations, relational data bases, applications development tools, desktop tools such as word processors and spreadsheets, image technology, Electronic Data Interchange, bar coding, and any other information technology that will help the corporation meet its business needs. A corporation's long-term business objectives should be somewhat stable; the information technology architecture (ITA) components should also exhibit some stability, while tactical technology plans are refined yearly.
Technology Planning Is Cooperative

A technology plan is a business tool. When developed and used properly, an effective technology plan can help a business hold down costs and improve efficiency. A poorly developed technology plan, by contrast, becomes no more than a blueprint for wasting time and money. A technology plan must be much more than a list of the computer devices to be purchased and applications to be developed; it must be a blueprint of how those devices and applications will be deployed, supported, and used.

A corporation's technology plan should be a reflection of how that corporation plans to use information technology to address its business needs over several budget cycles. As an example, some companies migrate all their desktop systems every four years, with 25% changing out each year of the cycle. To maintain systems, network, and application compatibility, the migration must be aligned with the long-term objectives of the company. For that reason, the plan must start at the top, bubble up from the bottom, and meet in the middle.

Senior management sets the business objectives while the business areas (i.e., client departments) develop the projects to support the business objectives. All levels of management have responsibility for the corporate technology plan, and the successful implementation of the plan depends on the close cooperation among all the various client and IS groups involved in specific IT projects. The technology plan must be revised annually to reflect changes in business objectives, budget availability, and information technology.

Role of Senior Management.

Senior corporate management has the responsibility for setting the corporation's long-term business objectives. Once those business objectives are set, they must be fully communicated to all levels of management, as well as to senior technical and business staff personnel. This last link is extremely important, because senior technical and business staff employees are usually on the front line during the technology planning process. The more direction they receive from upper management, the more realistic their technology plans will be when presented to management for approval.

Role of Client Departments.

Client department management has the responsibility for determining the projects needed to fulfill the corporate business objectives. These individuals and their senior staff employees must take the corporate business objectives and apply them to the daily operational processes in their department. They must ask themselves what they need to do or change in order for their department to meet the corporate objectives in a cost-effective and efficient manner. Once these tasks are determined, IT projects and acquisitions can be planned to achieve the desired results.

Role of the IS Management.

IS department management has the responsibility for educating senior management on how information technology can help achieve corporate business objectives. The IS department also has the responsibility for helping the client departments plan, select, and implement the information technology necessary to fulfill their business projects. This relationship must be a full partnership, with neither side dominating and both sides ready to
listen to what the other has to say. Technology planning is not adversarial; it is cooperative. There is enough competition in the marketplace outside the corporation; internal competition causes everyone in the corporation to lose efficiency.

These groups—senior management, client management, and IS management working together, must evaluate and answer several key questions to produce a workable corporate technology plan that is tied into real corporate objectives, involves real corporate projects, and reflects real corporate budget commitments.

**Key Considerations When Crafting the Corporate Technology Plan**

The corporate technology plan should study the following six topic areas:

- Corporate business objectives.
- Information technology (IT) industry trends.
- IT industry trends compared and contrasted with corporate IT trends.
- IT projects already being implemented across the corporation.
- IT purchases projected for the next budget cycle.
- Business changes that may occur when information technology is implemented.

If all levels of management take an active part in the total planning process and if these key topics are honestly and thoroughly covered, the corporation will have a planning document in which they can take great pride.

**Corporate Business Objectives**

Every corporation has business objectives that must be met in order for the corporation to survive and prosper. In many cases, those objectives are set by senior management without any thought given to how information technology could help attain them. The reasons may be that senior management regards the IS department as an expensive overhead item rather than an integral part of the corporate strategy for success, or it could be that IS management has not taken the steps necessary to educate senior management about the untapped strategic potential of information technology. Whatever the situation, it is vital that the technology planning process clearly identify those critical corporate business objectives and address how to meet them. Senior management, IS management, and client management must work as a team on this task.

**Summarizing Industrywide Information Technology Trends**

Information technology changes almost overnight. That in itself is enough to frustrate many planners. A brief summary of major information technology trends, including a projected schedule of a product's availability, is useful because these product trends may affect decisions made in a corporate technology plan. A review of information technology trends should, however, emphasize recognizable business linkage. This information should be developed and distributed early in the planning cycle to assist the client department planners with their specific projects.

**Contrasting IT Industry Trends with Corporate IT Trends**
Most corporations embrace a certain recognizable set of information technology products. Some companies even publish a catalog of endorsed (i.e., standard) computer products and then actively promote the acquisition of those products. If client departments control their own technology budgets, the IS department can promote the use of standard products and software packages by offering enhanced product support for those products. If the IS department controls a central information technology budget, the task is somewhat simpler: only standard products are purchased and supported.

**Product Acquisition Standards**

Many corporations use product acquisition standards as a way to discourage the buying of multiple products that perform similar functions or products whose life cycle is approaching obsolescence, thus avoiding a situation where product support becomes a nightmare. Given the complexity of today's software applications and networks, the use of tested and proven standard products reduces the support burden and improves business effectiveness. Only a small proportion of a workstation's total life cycle cost is involved in the purchase of the equipment. A far more significant proportion is spent on support and operation of the equipment. Using standard products can reduce that support and operation burden across the corporation.

A comparison of the corporation's IT trends with industrywide trends may help executives determine whether the installed base of standard computer products can support the corporate business objectives, or whether segments of the corporate information technology infrastructure need to be replaced or upgraded. This information developed and distributed early in the planning cycle helps the department planners with their specific projects.

Technology plans must take into account both business requirements and industry technology trends. A technology assessment group, or an asset management group, can be assigned the task of carefully aligning IT industry trends with corporate business requirements so that the planning process has some basis for decision making. For example, knowing the processor trends in the PC industry can set the workstation standards for acquisition. If the technology assessment group or asset management group is able to assign a risk factor to each projected product acquisition then document the rationale behind the risk assignment, management has hard data on which to base planning decisions.

**Awareness of IT Projects Being Implemented Across the Corporation**

Specific information technology projects are almost always under way at any corporation. A listing of those projects, by functional area, showing the technologies being used and linking them to similar projects in other areas, helps client department executives and senior executives see the overall IT implementation process at the corporation.

In some cases, different client departments may not realize that other groups are implementing similar projects. By combining efforts, economies of scale for acquisition and support may be realized. Because IT projects must be tied into real corporate budgets and real human resources both from the client perspective and the IS perspective combining similar projects can optimize the results of both projects.

**Listing IT Purchases Projected for the Next Budget Cycle**

Because information technology purchases should be linked to the specific projects, each business area should be able to list the technology purchases they plan to make in the next budget cycle. Once the business area planners have received information about the IT industry trends information and have compared these industrywide trends with the
corporate IT trends and standard product list, they should be able to project the specific IT products they need to acquire and deploy.

The IS department should act as a consultant to the business area planners during this process, if so requested. A master list of all the business areas and their related information technology purchases can be compiled to identify product-buying patterns and help set up blanket purchasing contracts for economies of scale. Purchases are linked to projects the technology plan should clearly state that if a specific IT purchase is deleted from the budget, then the applicable project must also be deleted.

Projecting Business Changes that May Occur when Information Technology Is Implemented. This is perhaps the toughest part. To be cost-effective in a business sense, information technology must change the way corporations do business and make them more effective. This changes the way people do their jobs and can be even more traumatic if people lose their jobs because of the change process.

Using information technology to automate manual processes gives an immediate payback in time savings, but it may not truly change the way an organization does business. Automated processes do the same things, only faster. For example, in the traditionally paper-intensive insurance industry, work processes had to be methodical and accurate, with each policy application or claim being carefully handled one step at a time. The passage of paper from one stage in the work process to another was time-consuming and labor intensive. To cut costs, insurance companies reduced their work force; to deliver better customer service, they offered innovative insurance programs and decreased response time on claims and requests. Technology was the answer for cutting costs and decreasing response times. Word processors accelerated the process and allowed fewer people to do more work, but the effort was still paper-based. The process did not change, but the speed of the process did.

Networking word processors together and sending documents via electronic mail began to change the way insurance work is done. E-mail has increased the speed of the process and allowed the process steps to be parallel rather than linear. But there were still many collaborative documents pictures, client letters, medical reports needed by each employee. The technology answer to that problem was the scanner. All the collaborative documents could be scanned as images and added to the electronic file so that each employee who needed to access documents pertaining to a certain client could do so without waiting for paper copies to be available. The combination of word processing, networks, electronic mail, and scanners along with the revised work processes to use them has given insurance companies the technology tools they needed to reduce their work force and still keep customer service levels high. But these technology advances come with a price a very human price as the technology enables fewer workers to do more work.

Addressing the Human Impact of Technology Change
Senior management approves of the changes because they make the business more effective and cost-efficient. A more efficient and effective organization is a healthy organization that can compete in the marketplace and therefore can offer its employees better job security. Nonetheless, the human side of information technology implementation must be addressed in the technology plan.

Whenever possible, planners should involve selected employees in the planning process as consultants and reviewers. Often these individuals can add valuable insights into the planning process because they know the work processes so well. It also gives the employees a sense of ownership in the project and makes them ambassadors for change. They can sell their coworkers on an idea faster than management can.
The technology plan must also address the skill levels of the employees. Because some employees may not be comfortable with technology or may lack the skills to use new technology, employee retraining should be planned whenever possible. An employee with knowledge of the company's culture and the required technology skills is much more valuable to the company than a brand-new employee who just has technical skills. As skill sets change, the reallocation of personnel resources should be addressed to take advantage of all the employee's skills. Employees may be less resistance to change if they know that the changes will not hurt them and may even result in an enhanced career path. Should it become necessary to lay off or terminate employees, however, every effort should be made to make the parting amicable for both sides. Often, economic situations change and the parting may be temporary.

**Sample of an Actual Technology Plan Document**

This section includes a sample of one planning document that has been successfully used in planning a department's projects for a two-year planning cycle. In this sample case, the IS/Distributive Processing department was responsible for the mainframe System Network Architecture network, small systems (departmental processors), local area networks (LANs), and enterprise area networks (WANs). The planning document includes a simple list of each major project (MP), grouped by major technology area. Nine projects are listed as examples in Exhibit 1, with details of two projects included in **Exhibit 2** and **Exhibit 3**. (In total, the actual technology plan document contained 36 specific projects that were proposed and accepted by senior management.)

**Sample List of Major Projects to Be Documented in a Technology Plan**

| SNA MP1 | Upgrade OJRP 3745/3725 Front End Processors |
| SNA MP8 | Support Disaster Recovery Test Plan |
| SNA MP9 | Install Intelligent Token Ring Hubs |
| SS MP3 | Install Intelligent Ethernet Hubs at Innsbrook Location |
| SS MP6 | DECnet/Pathworks Network Services Enhancement |
| LAN MP1 | Evaluate/Upgrade IS Test LAN |
| LAN MP5 | Integrate all LANs into Enterprise Network |
| ENT MP2 | Implement WAN Gateways/Repeaters/Bridges |
| ENT MP8 | High-Performance Network Study |

**Sample Technology Plan for Upgrading IS Test LAN**
Strategy: Support ongoing company operations through the effective application of information technology.

Owning Department: IS/Distributive Processing (LAN)

Major Program Description: PC/LAN MP 1 - Evaluate and upgrade IS test LAN as necessary to maintain technology base.

Resource Requirements:

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<th>COSTS</th>
<th>YEAR 1995</th>
<th>YEAR 1996</th>
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<td>O &amp; M</td>
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</tr>
<tr>
<td>Labor</td>
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Benefits:
- Allows testing of new products that should not be tested on a production system.
- Provides a "crash test" environment for IS-developed applications.
- Minimizes duplication costs of test environments in CS, DP, and information security.
- Yields more efficient use of IS staff resources through joint participation as opposed to arranging for the support of separate LANs.
- Provides an IS learning environment.
- Facilitates improved IS cooperation by having a focal point for joint participation, information sharing and teamwork.
- May help dispel the user perception of IS not working together as a team.

Assumptions:
- The purpose of this LAN is to provide a central test and training environment for IS personnel involved in LAN support and development activities. It will provide robust functionality in terms of hardware and software components and should facilitate improved IS support and service capabilities.
- Support for this LAN is critical to IS in terms of keeping pace with our clients and the technology they are using.
- O & M includes Novell Netware Update Service for 2.2 at $365, Novell Netware Update Service for 3.11 (20 user) at $650, and Novell Netware Update Service for 3.11 (100 user) at $1,300.

Schedule in Quarters: Not applicable

Sample Technology Plan for Integrating LANs into the Enterprise Network
Strategy     Provide IT support to allow timely and effective business decisions in all areas of the country.

Owning Department     IS/Distributed Processing (LAN)

Major Program Description     PC/LAN MP5 - Provide enterprise connectivity capability to all LANs in the company for selected network services such as E-mail and file transfer. Centralized servers will provide services to enterprise-connected LANs.

Resource Requirements

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<tr>
<td>O &amp; M</td>
<td>$ 25,000 (.5)</td>
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</table>

Benefits
-- Corporate LAN investments will be protected.
-- Enterprise communications will be enhanced.
-- Centralized network management will be possible on the enterprise network, thereby increasing enterprise reliability and productivity.

Assumptions
-- Corporate business functions will require enterprise access.
-- Corporate E-Mail will be required.
-- Corporate file transfer will be required.
-- Corporate directory services will be required.
-- Centralized servers will provide services to enterprise-connected LANs.
-- Servers will not be dedicated.
-- $20,000 is allocated for enterprise/LAN integration products.

Schedule in Quarters
4Q 1995
1Q 1996

One project involved upgrading the test LAN operated by the IS department so that it would continue to provide a realistic environment for testing new applications and recreating and resolving problems. Another project was to integrate LANs into the corporate network. Each project description includes the following:

- A strategy statement taken from the corporation's business plan.
- The department responsible for the project.
- The title of the project.
- A brief description of the project.
- The resources required, including capital costs, operations and management (O) costs, and personnel (i.e., labor costs).
- The expected benefits of the project.
· Any assumptions about the project.
· The project schedule.

Exhibit 2 and Exhibit 3 are only examples of how a corporate technology plan might be documented. The actual documentation requirements of the plan will vary, of course, depending on each organization’s objectives, internal communications requirements, and appropriate processes, which differ greatly in different companies.

Conclusion
Effective technology planning informs management as to how company employees use information technology to improve efficiency and interact with the rest of the company. Too many client and IS departments continue to use the technology planning process as a method of quantifying the number of new computer devices and applications needed during the coming year, rather than using the technology planning process as a tool for achieving corporate business objectives. If the technology plan is to be used as a business tool, it must include a study of these six recommended topic areas:

· Knowing corporate business objectives.
· Being aware of information technology industry trends.
· Comparing and contrasting IT industry trend with corporate IT trends.
· Being aware of IT projects already being implemented across the corporation.
· Knowing what IT purchases are projected for the next budget cycle.
· Being aware of business changes that may occur when information technology is implemented.

Because the technology planning process is cooperative, senior management, client management, and IS management, working together, must evaluate these key areas to produce a workable corporate technology plan that is tied into real corporate objectives, involves real corporate projects, and reflects real corporate budget commitments.

Author Biographies
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Howard A. Curle, Jr., is an information technology architect with Virginia Power. He has worked with information technology for almost 19 years. During that time, he has been a systems analyst, a data processing shift supervisor, an SNA network supervisor, an information center analyst, and a network planner. He has a BA in English from Virginia Military Institute and an MA in English from Virginia Commonwealth University.