Payoff

The management of information technology is no longer a self-contained operation within IS. This article suggests practical strategies for procurement and use of computer resources that includes input from many departments within an organization, including IS, end users, and business management.

Introduction

In the early years of automation, acquisition of information technology was placed completely in the hands of the IS staff. Information systems professionals identified the basic applications and solicited assistance and bids from selected vendors. IS designed the data base, acquired the computers, developed or bought software, and implemented systems. The process was complex only for those issues directly related to technical feasibility and data base design. Applications priority, the development schedule, user training, processing control, and other project management concerns became more important over the years.

To remain competitive, organizations must acquire and use information technology resources effectively. Numerous options in information systems development have evolved owing mostly to the proliferation of microcomputers and the movement toward distributed processing and client/server networks. With the introduction of new decision support and systems development tools, including prototyping methods, and users growing computer literacy and independence, serious attention must be given not only to receiving financial return on investment but also to acquiring quality products from multiple vendors who are reliable. This article emphasizes computer resource planning with an integrated procurement process from assessment through allocation a process that is outlined in Exhibit 1.

Integrating Master Plans with Action

The Master Planning Imperative

Some framework is needed to place an organization’s business objectives in proper perspective and, ultimately, to translate plans for meeting the objectives into action-oriented solutions. Many end users perceive that immediate hardware and software solutions are commercially available. On-the-shelf solutions usually prompt users to ask two questions:

- Why should there be such a long wait for quality results in the organization’s applications development cycle and procurement process?
- Can formal applications be purchased, perhaps by end-user departments, rather than developed?
Users may rush to bypass what they perceive to be lengthy procurement and development processes. Small pockets of funds in departmental budgets are available for such independent solutions and vendors are quick to respond with delivery of hardware and software. Total investment by these independent groups over a long time period is, however, costly and financially unsound. As line managers assume more operating responsibilities in today's information-based organization, IS management will continue to know less about all applications.

**Problems with User-Controlled Operations**

When IS management is relegated to only monitoring routine data processing activities, information processing capability becomes stagnant. IS management can respond by supporting or ignoring user-developed systems. For IS, the search for a more comprehensive solution is encumbered by the ongoing demands for immediate response, quality enhancement, cost containment, increased productivity, cash liquidity, just-in-time manufacturing and inventory, outplacement alternatives, and organizational downsizing moves.

In user-controlled and independent operations, daily operating procedures often conflict. Departmental data sets are separate entities, and because the data elements may not have unique definitions, data integrity is at risk. In addition, some fiscal status reports for senior corporate management require information from several operating functions. Unless the distributed data bases are integrated to a master system with true connectivity to the mainframe, the process requires manipulation of user data files.

When IS and users fail to cooperate, many problems can arise. For example:

- Funding for in-house or outside consultants to help operations run smoothly is often unavailable.
- Neither IS nor the users have the time or expertise to assess requests properly.
- Problem assessments often involve personnel with competing motivations and objectives.
- End users do not provide accurate information concerning application requirements.
- Overeager vendors provide solutions to organizational problems without an implementation plan.
- Insufficient attention is given to vendor contract terms, conditions, and systems deliverables.
- User documentation is either too technical or too simple, and user literacy is not considered.
- Contingency measures for delayed installation or maintenance of new applications are not identified.
- The roles of IS and end users after implementation of new systems are unclear.
- Access to the computer system by other departments or organizations is undefined.
• Expectations among end users, IS, consultants, and vendors are not delineated.

**Computer Resource Management Model**

To minimize or eliminate some of these conflicts, a long-range master plan with complementary short-term solutions should be established to produce a responsive, manageable operating environment. Traditional organizational models, although applicable for many segments of computer-related management issues, do not address all of these issues.

Case data supports a Computer Resource Management Model (detailed in Exhibit 2) that encompasses three managerial stages of assessment, acquisition, and allocation of information technology. Case study data collected from educational, government, and business environments uncovered a model for helping organizations implement computer resources, addressing the concerns of users. Thirty-eight case studies were examined over a decade for attributes relating to managerial issues of information systems planning and implementation. Conclusions were converted into operational action items, including collaborative strategies for IS and line managers, developing a Request For Proposal, and managing contract negotiations. Later sections of this article discuss these conclusions in that order.

**Computer Resource Management Model (CRMM)**
Addressing User Expectations

The data revealed that user expectations generally are not addressed. If the organization chooses to examine literacy levels, the review usually occurs after acquisition of computer resources. User activity is a function of computer literacy and computer fluency. Computer
fluency levels affect management procedures, responsibilities and accountabilities, resource constraints, priority of applications development, and overall risk-return analyses.

Applying computer resources to the right tasks, computer literacy levels of all personnel, and end-user computing philosophy are all integral parts of the planning and control imperative. For many organizations in which there is frequent change of computer capabilities in hardware, software enhancements, and distribution of computing, a formal declaration of authorities for computer systems procurement does not exist. There is a difference between organizational policy for centralized control and the reality of the situation when users acquire and implement standalone, low-cost PCs. Strategies are needed to develop a master plan. The preferred approach is one in which strategic initiatives and action statements drive the process to integrate information technology into business practice.

Collaboration Between IS Professionals and Line Managers

Several design and acquisition issues demonstrate the large scope of the process. The planning effort is a tremendous undertaking, and the frequent change of key personnel can discourage systematic approaches. However, if the organization is willing to commit time to the project at the outset and focus on creating an adaptable long-term solution, then this approach is beneficial to the organization. The financial portion of the contract focuses on cash flow and tax breaks. A phased-in approach with documented milestones and prioritized applications can be implemented. In this way, some results can be realized while the process unfolds.

Vendor relationships should be developed for the long-term with negotiations based on predetermined issues. Procedures establish not only the impact of business programmatic changes, but also the opportunities afforded by technology updates on computing resources. As hardware and software products proliferate and their costs decrease, other extensive systems studies and procurement groups do not have to be reestablished. Historical records are helpful in preventing duplication of effort.

The proposed Computer Resource Management Model uses committees and task forces to focus on design of the best system for the whole organization. A committee should assess technology in all facets of the organization before any procurement action is taken.

All facets of end-user computing become planned activity. Software development by users becomes part of the total effort and should not produce any independent data bases or file incompatibilities. Overall benefits of this approach are to reduce costs, minimize risks, use available resources properly, and improve management. The key concept is to quickly develop the master plan, appoint the right people to a loosely coupled network structure of task forces, and produce results on a timely schedule.

Forums

Senior-level managers, including corporate information officers, must provide forums where ideas can be introduced and emerging strategies can be converted into action. Because information technology must be mobilized to support these strategies, the specific responsibilities of the task forces must be identified at the outset.

Line managers and IS professionals must reach a detailed formal agreement addressing the use of information technology for making gains in personal productivity, adding business value to the organization, enhancing the image of the firm, and improving the quality of products or services. Forums should not be complaint centers for current
operating problems; these comments could be handled by a separate action team concentrating on those issues.

Forum activity should be visionary. Forums should assess corporate strengths and use them to grasp opportunities in the near term and in the long range picture. Other collaborative strategies are outlined in Exhibit 3.

Collaborative Strategies for IS Professionals and Line Managers
1. Securing top-level support for managing information technology in the key areas:

- Authorities to control ongoing process by collaborative task forces.
- Task force makeup: cross-functional teams of IS and line management.
- Dissemination of information formally to all organizational elements.
- Implementation plan with flexibility for new users and applications.
- Strategies with vision and integration of information technology into business plans.
- Decision-making criteria and impact on information technology procurement.
- Requirement for planned implementation for migration to new technologies.
- Creation of new reward systems commensurate with project-oriented work.
- Support of an educational program for new organizational structures.
- Encouragement to design and implement self-directed teams (task forces).
- Discouragement of independent information technology activity.
- Integration of information technology in financial planning process.
- Requirement that IS, line managers, and vendors meet business objectives.
- Requirement that IS, line managers, and vendors communicate for effectiveness.
- Emphasizing strategies with action plans are more effective than crisis reaction.

2. Developing a specific set of objectives for management, including:

- Scope, constraints, milestones, membership roles, and responsibilities of task forces.
- Critical success factors and actions needed to exploit them.
- Identification of corporate strengths and application opportunities.
- Identification of corporate weaknesses and conversion to strengths.
- View of future (5 to 10 years) technological advances in hardware, software services.

3. Creating a forum for ideas, including:

- Discussion of process and criteria for justification of resources.
- End-user involvement, including in applications development.
- Impact of process on organizational philosophy and business practices.
- Establishment of a communications system using groupware and other mechanisms.
- Several task forces loosely structured to address issues, problems, and opportunities.
- Allocation (immediate and long-term time) solutions.
6. Planning the information technology selection process, including:
   Schedule for procurement process and evaluation.
   Immediate, short-term, and long-range acquisitions.
   Procedures for all phases and all participant roles and responsibilities.
   Full consideration of, and accountability to, task force recommendations.

7. Establishing RFP process and working RFP, including:
   Comprehensive framework used as continuous reference document.
   Flexibility on scope and constraints for standard and fast-track processing.
   Historical record for justified changes to RFP as new information emerges.
   Continuous dialogue back to task forces for additional information.
   Focus on the need for long-term relationships with vendors.

8. Addressing design issues, such as:
   Total systems solution with integrated segments, or phases of migration to new information technology.
   Inclusion of all computer-related operations in systems design plan.
   Exploration of standalones, networks, and connectivity concerns.
   Outsourcing possibilities as integral part of solution.
   Specific criteria for vendor evaluation and establish evaluation system.
   Provision for a secure, easily accessible, and comprehensive data base.
   Requirements-driven architecture, not just current computer system adaptat.
   System for creating and implementing system standards for hardware and software.
   Provision for physical standards (e.g., optic fibers, equipment, services).
   Pathways for expansion of internal computing to external electronic highways.
   Data base entry, access, and change authorities: who, why, what conditions, how.
   All levels of management participation: cross-functional task forces.

9. Executing the selection plan by establishing:
   Time frame for developing evaluated costs for vendor comparisons.
   Formal procedures for solicitation, contract negotiation, and bids.
   Definitions of terms used in contract to resolve semantic differences.
   Clarification of mandatory and desirable requirements.
   User-driven, business oriented standards and specifications.
   Product modules, phased-in approaches, application priorities, and schedules.
   Nontechnical evaluation: training, openness for future change, flexibility.
   Vendor procedures, constraints, responsiveness consistent with client objectives.
Developing the Request for Proposal

The Request For Proposal document provides specific deliverables. The effort spent developing a solicitation document should equal the expected return from the information processing capability.

Strategies incorporated in this document should emerge from task force discussions, findings, conclusions, and recommendations. The selection team for information technology concentrates on procurement, but it will have the benefit of the wisdom, experience, and cross-functional perspective of task force activity to justify its request for proposal (RFP).

Actions to Consider in RFP Development

The Race for Installation.

Analysis and design activities are costly and usually do not show any immediate return for the expenditure. Frequently, these phases are accelerated for purchase of hardware and software. Guidelines include:

- Conducting an assessment to make a deliberate decision of the level of detail to be undertaken for analysis and design. Somewhere between the very general specifications and the very specific terms and conditions lies a balanced portrayal of information for the request for proposal (RFP).

- Ensuring that the effort is commensurate with return-investment and risk-return ratios. Identify intangible benefits, hidden costs, and expected productivity gains for new opportunities.

- Ensuring consistency between the desired level of detail required of vendors and the request for proposal (RFP).

Authority and Control of Selection Procedures.

Procedures may be documented but not implemented. IS management may not be situated high enough in the organization to provide objective leadership to control computer resources. IS should act to:

- Place IS management at a level high enough to form an action team with authority and responsiveness.

- Establish formal authorities for computer resource allocation with input from end users.
Task Forces or Advisory Planning Groups.

The process of managing information technology does not end with advisory group recommendations; it must be a continuous process if it is to have an effect on the organization. Activities center around:

- Creating advisory groups to design, implement, and oversee all aspects of the process.
- Developing operational mechanisms that won't impede progress and that allow for new users, new applications, and new priorities consistent with changing business requirements.

Information Technology Evaluation Team.

Because the evaluation process is multidisciplinary (involving end users, technical experts, contracting and purchasing personnel, legal, and finance), the makeup and size of the group depend on the current and intended scope of computing in the organization. Guidelines in this area include:

- Selecting a team with expertise for proper evaluation of the product or services sought.
- Assigning as chairperson an experienced business operating manager with leadership abilities.

End-User Computing.

End users must be an integral part of the procurement process to achieve success in using that information technology effectively. Issues of applications development and other related user activity must be addressed at the outset by:

- Formalizing end-user and IS relationships for each aspect of procurement.
- Documenting specific objectives that exploit strengths and reduce weaknesses.
- Capitalizing on new business opportunities made possible by technology and people.
- Ensuring that the management of information technology is consistent with business planning.
- Providing for mainframe connectivity and hardware and software compatibility.

Administrative versus Other Types of Computing.

This issue is philosophical, power-based, and political. Computing resources are, after all, an expensive budget item. Policy guidance should be established. Examples are: administrative versus instructional use of computers in higher education; administrative versus research and development for business. This activity involves:

- Tapping members of the computer selection group to examine and suggest solutions for conflicts (total fund allocations and schedule for implementation).
· Creating a system for measuring computer literacy level of all administrators, staff, and computer professionals.

· Establishing organizational standards and incorporating these capabilities in request for proposal (RFP) requirements.

**New Technology's Impact on the Organization.**

Although it is not always possible to anticipate the full impact that computer systems upgrades will have on an organization, some assessment of how new technology will affect the organization should be a goal at the outset of the process. The request for proposal (RFP) represents not only technical and financial specifications for computing, but also indicates future areas to be supported by technology.

**Negotiating the Contract**

It is important to promote an atmosphere in which philosophy, discussion, and action merge to produce the best solution for each unique party. Contract negotiation suggests a lengthy process. Because arbitration and debate are encouraged by these guidelines, terms and conditions are examined extensively. Conclusions resulting from a discussion of issues form the basis of a written document that is then enforceable. If areas of dispute arise, there is a reference document on which to base the arguments. A self-assessment guide for managing contract negotiations is presented in Exhibit 4.

**Self-Assessment Guide for Managing Contract Negotiations**
Hardware, Software, and Services
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Strategic and operational cost/performance data, support services, and training.
Requirement for vendors to respond to predetermined format.
Individual component costs, depreciation factor, and discounts.
Data communications issues: definitions of system responsibilities.
Phase-in methods: annual modifications and business disruptiveness.
Purchase, lease, or other payment plans, with proper comparison of bids.
Maintenance specifications: end-user standards and requirements.
Operational capability demonstration and references.
User-friendly systems and applications software.
Concurrent usage of system: response peak loading and priorities.
Processing throughput measurement.
System expandability: memory, communications channel, and user stations.
Connectivity and compatibility issues for internal and external systems.

Additional Software Issues
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Ownership, site licensing, maintenance: intellectual property issues.
Ethical and leadership issues with all aspects of use of software.
Conversion terms and conditions: data entry, programming, and testing.
Memory requirements and compatibility with system upgrades.
Levels of priority: utilization, recovery, debugging, and file management.
File protecction options for updating and enhancements.
Customizing features: buyer allowances and prohibitions.
Control of processing schedule: end-user options.
Acceptance criteria and time frame for trial period.
Termination clauses.

Other Contracting Terms and Conditions
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Backup system: procedures, costs, and responsibilities.
Training requirements: computer literacy assessment and location of users.
Documentation of all phases of management of information technology.
Implementation planning: computer literacy assessment and location of users.
Documentation of all phases of management of information technology.
Implementation planning: schedules and actions.
Technical assistance from vendor: constraints, costs, and accessibility.
Multivendor systems: authorities and responsibility tree.
Cost guarantees and time period for which applicable.
Replacement of hardware, software, peripherals: cost for upgrades.
Confidentiality issues of contract negotiation and implementation.
Formal negotiation procedures: time frame and conditions.
Account management: personal contacts afterward and for implementation.
Cancellation provisions and payment schedule for changed arrangements.
Protection against natural disasters.
Provisions for major organizational changes (including mergers and acquisitions.)
End-user involvement through all phases of contracting.
Noncompliance penalties: timeliness, completeness, and opportunities lost.
Site preparation: physical conditions, remote sites, and cable installations.

The purpose of a written agreement is to ensure that all parties understand the terms of the requested service. To deflect timely and costly litigation, not only should the client prepare a document for computing capability acquisition, but the document should also be reviewed by legal staff.
Conclusion

Organizations need a concrete strategy when procuring computer resources. The Computer Resource Management Model discussed in this article can be used by the average nontechnical administrator and the IS professional. This model, derived from case data collected over a decade from a variety of organizations, is based on universal concepts that apply to information technology assessment, acquisition, and allocation.

An organization does not have to apply the entire process (selection plan, Request For Proposal, negotiation) in order to realize the benefit of automation. The computer resource management model approach applies to any type of organization at any staff level (division, department, or individual end users).

Some people may wonder if a formal request for proposal (RFP) is really necessary and practical in terms of the effort needed to draft it. The answer is yes. In order to be competitive today, response is important. In addition, accurate, complete, and reliable information is critical to success. Organizations that have operational objectives, make creative use of the right information getting to the right people at the right time, and employ structured, documented approaches to computer resource management are competitive.

Some form of request for proposal (RFP), even if it addresses only a few carefully selected and important issues, is necessary. The questions it asks of users and IS professionals in justifying a purchase and relating it to business operations is invaluable and practical.

It is especially important that organizations adopt some form of master plan for computer resources now that solutions proliferate and more informed users engage directly in information technology. The new tools must be used for the right applications. Prototyping methods can be highly successful if the organization fully supports the technique. End-user computing and user-developed applications require formal agreements with IS staff. The Request For Proposal, or some similar solicitation document, together with the selection plan and contract, can help avoid costly mistakes and serve as the basis for the solution.

Author Biographies

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Establish Framework for Planning
- Computer Resource Management Model (CRMM)
  - Stage I: Assessment
  - Stage II: Acquisition
  - Stage III: Allocation

Develop Strategies, Procedure and Roles for Information Technology
- Collaborative Strategies for IS Professionals and Line Managers

Prepare a Formal or Informal Request for Proposal (RFP)
- Analysis and Design for Requirements Definition
- Authority and Control
- Action Planning Teams
- Information Technology Assessment
- End-User Computing Issues
- Applications Portfolio Priority System
- Organizational Impact