ACADEMIC PROGRAMME: Bachelor of Business & Information Technology

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Costing and Hidden cost of MIS

Expected Learning Outcomes:

By the end of this lesson, you should be able to: (Arial, font size 12)

i)   Explain costing process for implementing and MIS
ii)   Discuss hidden cost of MIS
iii)   Describe how to minimize the impact of hidden costs
iv)   Analyze Factors for Success and Failure

Introduction

The acquisition and maintenance of information systems require a commitment of library resources beyond the initial outlay for hardware and software. A number of guidelines are available for how to budget for new systems, yet budgets often prove to be inadequate, forcing organizations to accept less-than-optimal solutions. Sometimes, costs are hidden from budget planners by vendors who promise everything, but fail to differentiate which features are standard and which require modification at the customer's expense. At other times, costs are hidden by the budget planners themselves, intentionally or accidentally, when they underestimate the resources required to implement a system and assume that implementation can occur without detriment to other work. Contributing to these hidden costs is a lack of understanding that can occur, despite careful needs assessment and planning, of how the system will be used within the organization and what it will take to operate it locally. This paper will address factors that contribute to hidden costs and suggest methods for revealing them.

Beyond the budget: secondary effects of information systems

Years of experience as a systems analyst with an information management company offered me many opportunities to participate in the selection, configuration, implementation and maintenance of information systems. In every case, great care was taken to assess the needs for such systems, rank the required functionality, and select the best application. Careful research and planning resulted in preparing what was thought to be a reasonable budget for each project and, in most cases, projects were completed within the allocation and within the anticipated time frame. Yet, often unanticipated issues and problems arose, and some with dire consequences either for the budget or for the utility of the system. One example is a case, where the discovery that a system already under implementation would need to support a third more users than initially planned, resulted in additional costs for the server, the software license, plus that of wiring the facility, as well as the cost of additional workstations.

More difficult than anticipating problems and costs associated with implementing a system is assessing how the system will be used over time and what it will cost to maintain it. In planning for information systems, project managers tend to emphasize potential savings and benefits over costs. The anticipated benefits and planned improvements for an organization introducing a new technology are called the primary effects. Beyond the primary effects are secondary effects, or unintended consequences

(Sproull and Kiesler, 1991) with their associated, unanticipated costs and benefits. Secondary effects may include:

- •evolution of uses for the system that require additional training or system modification;
- •the restructuring of positions resulting in employee turnover; and
- •the emergence of tasks or services that were not needed before.

While it is impossible to anticipate every problem that may occur in system implementation or every consequence associated with system use over time, it is possible to minimize the financial impact with realistic expectations and careful planning.

Categories of omission

One useful methodology for assessing the impact of introducing a new system on an organization is the work-centered analysis (Alter, 1999). This methodology evaluates an information system within the framework of the organization and considers who will use it (patrons and staff), how it will be used (the technology to be employed), the structure and variety of the information going into and coming out of the system, and the processes that the system will support. When used during system implementation, the work-centered analysis reduces the likelihood of overlooking potential problem areas and, when used in strategic planning, it can help to identify areas of potential concern for the operational budget.

Applying the work-centered analysis to his own research, Alter observed the following categories of omission in budgeting for implementation:

- •the salary and overhead of user staff and management involved in the analysis and implementation;
- •costs related to other work that may be disrupted or displaced in favor of the system implementation;
- •costs of modifications to the site, such as rewiring; and
- •costs of and time for training.

I suggest two additional categories, where costs may be inadvertently overlooked:

1. 1.(1) conversion of existing systems or processes; and
2. 2.(2) the consequences of enforcing the limits of the budget.

Costs that tend to be hidden and therefore unanticipated or underestimated during the operation and maintenance of a system include:

- •impact on organizational work; and
- •technical support.

Implementation

Project implementation technically refers to the period within the life cycle of a system when the requirements have been completed, the design agreed upon, and the hardware and software chosen. During the implementation phase of the project life cycle, the hardware and software are installed and the transition from the prior system (or no system) to the new one occurs. It includes conversion of data, training of users, and testing of the system to ensure that it functions as planned. Implementation may also involve reengineering of organizational processes to accommodate and respond to system features. Careful planning can result in a smooth implementation process, but there are several areas where there is a tendency to overlook or underestimate costs. Indeed, Bikson (1985) suggests that organizations typically do not know how much implementation costs, and offers the example of one

corporation where it was estimated at 40 percent of the total system project. This is an alarming revelation for organizations that typically budget for the cost of hardware and software alone.

Bikson recommends the following guidelines for budgeting systems projects: 10 percent hardware, 10 percent software, 30 percent software development and modification, 40 percent implementation, and 10 percent training. Following these guidelines may not seem realistic for libraries faced with the prospect of purchasing expensive integrated library systems on limited funds. After all, large systems projects tend to be funded through special, one-time allocations rather than through routine operating budgets, and detailed justification for planned expenditures is crucial to winning approval. For those cases, it is particularly important to keep in mind areas that Alter identified that tend to be overlooked. They include:

Salary and overhead of managers and staff involved in decision making

In planning for systems projects, managers tend to budget time and funding for those individuals who comprise the project team, but they rarely build in adequate time or assess the costs of their own review, analysis and decision making related to system selection and implementation. In libraries, this may include release time from other duties and/or funding for travel to the vendor or other customer sites for demonstration and evaluation (although travel costs are often omitted from the budget or hidden under general professional travel budget categories).

Impact on other work

During the implementation phase of the project life cycle, other work may suffer in order to meet deadlines. This comes at a price. The cataloging backlog may increase, if a cataloger must test, provide feedback, or be trained on a system module. An administrative assistant assigned to document the implementation process may miss other work deadlines or be forced to rearrange priorities. If the staff is heavily involved in system implementation, the quality of a collection or a service may be temporarily (or even permanently) diminished. If reduced service is not an option, then it may be necessary to hire temporary workers to assist during the implementation period, something often overlooked in budgeting for implementation.

Modifications to the site

Acquisition of hardware and software alone is often inadequate preparation for a new system. New furniture may be needed to accommodate equipment, particularly in shared work areas such as public seating, the circulation desk, or the information desk. Noisy printers have to be covered and work spaces must be ergonomically designed to avoid repetitive motion injury or discomfort. These costs are relatively minor when compared with the costs of wiring a building or adding air-conditioning to support equipment, but it is an area that often fails to receive attention until post-implementation problems arise.

Training

The budget for training is rarely adequate. Vendors often offer training packages with their products, but such packages frequently fail to include local customization or to consider the organization's training needs over time. Consequently, it may be necessary to purchase additional training for staff and, as staff members come and go, training is an ongoing process. Training will also be needed with system upgrades and frequently this occurs at the convenience of the vendor rather than the organization, but it is the organization that pays for the inconvenience.

Most organizations opt for a "train the trainers" approach, where a few individuals receive in-depth training and then train everyone else. This approach is economically beneficial and makes the most of the training offered by the vendor, yet may still be inadequate. Trainers need the time to practice, to develop training materials, and to update those materials as changes occur in the system or in the way

the library uses the system. In corporate libraries, where "knowledge managers" are emerging as part of collaborative teams, the knowledge manager may perform this role. Centralizing the expertise is worthwhile, but managers must be careful not to underestimate the amount of time and resources required for training.

Conversion costs

Acquisition of a new system may require conversion of data and reengineering of processes to fit the new environment. Conversion costs include developing procedures to transfer the data to the new system, testing, and cleaning the data. Sometimes, costs associated with converting data are so high that conversion is not feasible. (Such was the case with early information systems that converted new data, with retrospective conversion projects for older materials performed later, as time and money allowed.) It is important to note that there are operating costs associated with not converting data, including the cost of maintaining separate tools for access, and this should be considered as well.

Configuration based on the bottom line

One of the hidden costs associated with acquiring a new system occurs as a result of budget constraints. Sometimes the decision is made to buy the largest hardware system the institution can afford rather than an optimal system for the application. This is almost always a mistake. Within weeks or months of implementation, it may be necessary to add processing power, storage devices, additional software licenses, or to suffer an inadequate system. Constrained budgets are not always simply the fault of poor planning. Sometimes vendors are less than forthcoming about the optimal operation of their products, and sales representatives are not technicians and rarely have experience or real knowledge of the operating requirements of the systems they sell. Many institutions can accept a project cost over-run of as much as 5-10 percent without serious consequence but, when over-run is not an option, then decisions concerning system configuration must be made with care.

Maintenance

The maintenance phase in the system life cycle involves the day-to-day operation. It includes technical costs associated with licensing the hardware and software, supporting users, maintaining the application and files, and performing routine quality control. While license fees are known and are usually included in the budget, two areas of costs are often overlooked:

1. 1.(1) the impact on organizational work; and
2. 2.(2) staff support.

Impact on organizational work: the costs of process reengineering vs customization

True turnkey systems that can be purchased from a vendor, plugged into the organization, and put to work are rare. Most organizations have special needs for reporting and for information handling that are unique. When systems cannot readily accommodate those needs, organizations must either customize the software or reengineer processes. Customization usually comes at a price – either the vendor must be paid to make the changes, or the local systems team must do it. In the latter case, it may mean buying the software source code and developing applications that future vendor releases of the software may not support. In such cases, dedicated technical staff may be required to track the changes and modify the system routinely.

Some organizations choose to avoid the costs of customizing the product, since even simple programming modifications may run to thousands of dollars, by reengineering processes to match the capabilities of the system. It is difficult to assess the costs of these procedural work-arounds, yet often managers assume that this is an inexpensive solution. Yet, it may take weeks to work out optimal procedures that must then be taught to others and documented for consistency. Over time, new software releases can impact these procedures, requiring that they be reengineered with each release. One academic library, for example, stored local holdings information in fields of the MARC record

that have no current standard use. When a later release of the software would not accept data entry into non-standard fields, the library had to develop new ways of handling local holdings, modify the procedures, and revise the older records.

Support staff

The amount of training and support required to operate a system is an area of concern for the maintenance phase of a project. Vendors often tend to underestimate the time and level of technical expertise required to maintain a system. Sometimes they simply take for granted that the requisite skills are available to the library, or they may emphasize the usability of the system and the availability of their own technical resources to reassure customers that maintenance costs will not be prohibitive. Technical support comes with expensive license fees or hardware maintenance agreements, yet it is wise to have them when the inevitable problems arise. Still, vendor technical support alone is rarely sufficient for system back-up, report generation, user support and problem solving. Support from the vendor may be essential, but it will require someone knowledgeable with the local environment and the application to work with them.

How to minimize the impact of hidden costs

There are four strategies that may help to minimize the impact of the hidden costs of implementing and maintaining systems. They are:

1. 1.(1) analysis of the fit between a system and the organization's processes;
2. 2.(2) managerial commitment to the project;
3. 3.(3) consultation with other users; and
4. 4.(4) contingency plans for worst case scenarios.

Work-centered process analysis and system fit

One way to minimize the cost of acquiring a system is to devote as much effort as possible to needs analysis ahead of time. Conduct position audits that determine what staff actually do as opposed to their position descriptions, conduct work flow analyses to identify how processes are carried out and correct ineffective information management procedures. The reasons for purchasing a new system or upgrading an old one are usually good, e.g. to gain the benefit of a faster processor, improved functionality, and ease of use. To ensure that the gains are greater than the costs, select candidate systems best qualified to meet the needs and choose the system that most closely approximates how the organization works. Let cost be only one factor in the decision. Saving a few dollars on purchase can result in spending thousands on adjustments later on.

Make the commitment

Long-term costs of implementing and maintaining an information system should be budgeted responsibly. This requires a commitment of management to allocate the necessary human and financial resources to the job. Commitment includes everything from relieving project staff of other duties, so that they may focus on needs analysis and product review, to making certain that supervisors and managers provide timely response. Undue pressure to stay within a budget, or to complete a new project while simultaneously carrying out other duties, sends a message to staff that their normal work is unappreciated or unimportant, and misrepresents system costs. Budgets should be flexible enough to accommodate a more expensive computer, printer, or telecommunications connection for greater efficiency over the life of the system; or to include additional temporary staff to prevent other work from falling behind.

Bikson's study suggests that, if budgets for information systems are weighted too heavily toward the actual costs of hardware and software, then they will be woefully inadequate. After implementation, recommendations for operating and maintaining a system over time vary from 5 percent to 20 percent of the initial cost per year. The lower figure is applicable primarily for licensing and maintenance

agreements, but the higher figure may be more accurate when taking into consideration technical support and training. The commitment to a new system involves more than obtaining funding for a purchase, but requires ongoing budget support as well.

Consultation with other users

One way to reveal hidden costs of implementing and maintaining a system is to talk to others who have been there. This includes getting a list of the vendor's customers who are willing to share their experiences. Making a visit to the site and learning from their mistakes and successes can be beneficial. Other organizations may be particularly helpful in determining whether additional staff will be needed to maintain the system. It will be helpful as well to look at their organizational characteristics to see how they compare. Two organizations may have totally different experiences based on the size or expertise of the technical staff, the availability of economic resources, and how the application relates to the organization's mission. If software user groups are available, then it is advisable to join them, as there is power in numbers and membership will guarantee a voice in how future releases of the software will develop. (Membership fees and some travel costs are associated with participating in user groups, as well as time away from other tasks.)

It may be advisable to request consultation with the vendor's own technical staff even before purchasing a system. Sales representatives are usually not qualified to answer technical questions and may give vague or misleading answers; therefore contact with the technical team may help to develop trust and to provide valuable budget input. It has been demonstrated elsewhere that good communication between vendor and customer is mutually beneficial (Walther, 1998).

Contingency plans for worst case scenarios

Probably the best contingency plan is a budget that has room for adjustment, and a sound contract that protects the investment. A vendor can go out of business, be taken over, or decide to stop supporting a product. Beyond that, a thorough risk analysis and contingency plan are needed to ensure continued operation, should anything go wrong. Libraries are as vulnerable to flood, earthquake, hurricane, loss of key personnel, or other disaster as any organization, and library systems are as vulnerable to hacking and computer crime. The best way to avoid the worst and minimize associated costs is to plan for them.

Summary

As long as a new generation of computer hardware and software appears in the marketplace every six months or so, organizations must periodically consider the acquisition of new systems or updates to those existing. These systems may be as complex as a state-of-the-art integrated library system, or as simple as spreadsheet software for preparing the library's budget. The cost of acquiring these systems involves more than the purchase or license of hardware and software. Systems can rarely be purchased off-the-shelf, plugged in, turned on, and immediately used, but usually require some customization or modification to organizational routine, and the costs associated with these modifications are often overlooked in the bottom line. Bringing these hidden costs to light is essential to determine the real price of a system and to assess its potential value to the institution.

References

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