

CHAPTER 10

Information Resource Management and Project Management

LEARNING OBJECTIVES

After reading this chapter, you will be able to answer the following questions:

1. What are the various components of information resource management and the issues involved in each component?
2. What are the objectives of project management, and why it is so essential in developing information systems?
3. What methods can be used for selecting and evaluating information systems projects and methods for aligning IS projects with the firm's business goals?
4. How can firms assess the business value of information systems projects?
5. What are the principal risk factors in information systems projects?
6. What strategies are useful for managing project risk and system implementation?

This chapter introduces students to the business value provided by information systems and describes both financial and nonfinancial models that can be used to help assess the business value. This chapter also discusses the role of change management in successful system implementation, as well as presenting strategies for reducing the risks associated with systems projects and improving project management.

OPENING CASE: CARGO PORTAL SERVICES BRINGS COMPETITORS TOGETHER

The opening vignette, "Cargo portal services brings competitors together," is a great way to start the discussion on this chapter. You can use this case to illustrate the need to plan thoroughly by including realistic time and cost projections. Most projects fail to come in on time, within budget, and with all of the functionality that was proposed. One of the principal challenges posed by information systems is ensuring they can deliver genuine business benefits. There is a very high failure rate among information systems projects

because organizations have incorrectly assessed their business value or because firms have failed to manage the organizational change process surrounding the introduction of new technology. In addition, poor management in the IS department can negatively affect the business value obtained from information systems.

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10.1 INFORMATION RESOURCE MANAGEMENT

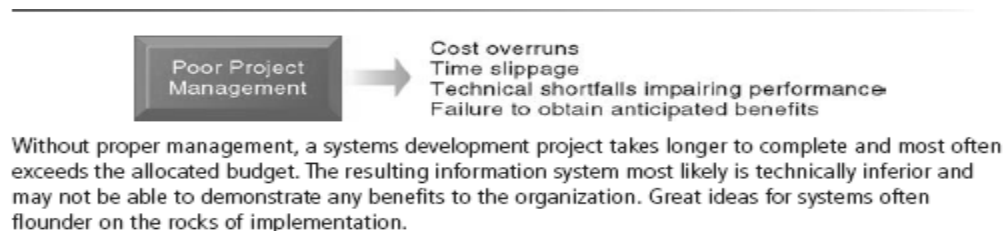
This section describes the actual workings of the typical information systems department. Figure 10-1 depicts a typical IS department organizational structure; this can lead to the discussion of the various roles and job positions held by employees in the IS department. As with any department, managing budgets and personnel is critical to departmental success and can be critical to organizational success. While Chapter 9 discussed actual systems development, this section looks at how to manage systems development.

10.2 THE IMPORTANCE OF PROJECT MANAGEMENT

How organizations can determine, dollar and cents wise, whether a project can be successful is our focus in the first part of this chapter. The last half of the chapter focuses on using information systems as a way to successfully help redesign organizations so they can improve their current processes or establish new ones.

Runaway projects and systems failure

As illustrated in Figure 10-3, a systems development project without proper management will most likely suffer these consequences:



Project Management Objectives

A **project** is a planned series of related activities for achieving a specific business objective. A high percentage of information systems projects take more time and money to implement than originally anticipated or is delivered with missing functionality.

Project management refers to the application of knowledge, skills, tools, and techniques to achieve specific targets within specified budget and time constraints. Project management activities include:

- Planning the work
- Assessing risk
- Estimating resources required to accomplish the work
- Organizing the work
- Acquiring human and material resources
- Assigning tasks
- Directing activities
- Controlling project execution
- Reporting progress
- Analyzing the results.

Good project management is essential for ensuring that systems are delivered on time, on budget, and provide genuine business benefits.

Project management must deal with five major variables:

- *Scope* — defines what work is or is not included in a project
- *Time* — is the amount of time required to complete the project
- *Cost* — is based on the time to complete a project multiplied by the cost of human resources required to complete the project
- *Quality* — is an indicator of how well the end result of a project satisfies the objectives specified by management
- *Risk* — refers to potential problems that would threaten the success of a project

WINDOW ON MANAGEMENT: MANAGING IT IN THE MERGER AND ACQUISITION GAME

Combining the information systems of two different companies usually requires considerable organizational change and complex systems projects to manage. If the integration is not properly managed, firms can emerge with a tangled hodgepodge of inherited legacy systems built by aggregating the systems of one firm after another. Without successful systems integration, the benefits anticipated from the merger cannot be realized, or, worse, the merged entity cannot execute its business processes and loses customers.

TO THINK ABOUT QUESTIONS

1. What are some of the risks involved when one firm acquires another firm's IT infrastructure?

A number of risks are stated in the case. The target company:

- May have stopped spending on maintenance years ago to decrease costs and increase profits.
- May have fallen behind competitors in new applications.
- Software licenses may not be transferable to the new company without significant fees.
- Systems may be totally incompatible with the acquirer's systems.

“Due diligence” is a critical element when it comes to mergers and acquisitions. Due diligence is a legal requirement of senior management to ensure the financial and business statements of firms they are acquiring are accurate and complete.

2. Why do firms often fail to take the target firm's information systems and IT infrastructure into account when purchasing other firms?

Traditionally, M&A's were entered into for financial reasons (greater market share, elimination of competitors, greater efficiency and profitability), and were led by financial managers. With that being stated, it is easy to see why these professionals did not give enough attention to the target company's IT infrastructure. “Bean counters” are used to counting dollars and cents, and for years a company's IT infrastructure was viewed as a financial drain on a company rather than classified as one of its main assets.

3. How would you go about assessing the value of another firm's IT infrastructure and operational capabilities? What questions would you ask?

Some management tactics for dealing assessing the value of another firm's IT infrastructure and operational capabilities include:

- Classify the assets your firm is about to acquire
 - Transaction systems
 - Informational systems
 - Strategic systems
 - Basic infrastructure
- Create an inventory of the target firm's IT assets in order to value their potential contribution to the new firm.
 - Keep the target company systems if they are better than your own
 - Keep your own systems and retire the target company systems if yours are better
 - Choose the best of both companies' systems
 - Use the M&A to build an entirely new infrastructure
- Educate management on the risks involved in mergers and acquisitions

- Education and caution will go a long way towards reducing the threat to shareholder value and falling stock prices.
- Avoid overvaluing the assets of the target firm while at the same time systematically underestimating the risks of the acquisition.
- Obtaining a solid understanding of the costs involved in mergers and the operational activities and information system infrastructure as it relates to both firms (realistic costs of integration).
- Estimate benefits of economies in operation scope, knowledge, and time
- Identify any problematic systems that require major investments to integrate
- Identify and understand likely costs and organizational changes required to upgrade the IT infrastructure

MIS IN ACTION QUESTIONS

1. Bain and Company is one of the premiere international business consulting firms specializing in advice about mergers and acquisitions. Visit <http://www.Bain.ca> to learn about the firm's Canadian operations, and explore the advice on the company's main Web site, <http://www.bain.com>, on how to conduct a successful merger by clicking on the "Consulting Expertise" tab, and then selecting "Mergers & Acquisitions." Read this page, and then click on "Client Successes" and choose the Mergers & Acquisitions capability. Why does Bain advise managers to stay close to their "core business?" Why might this advice ease the change in information systems infrastructure when mergers take place? Why does Bain recommend about "integration" of the business and how would this affect IS/IT decisions?
2. On the Web, explore the IT/IS integration issues raised by one of these mega mergers of the past few years: Great West Life, Canada Life; Clarica/SunLife; Toronto Dominion Bank, Canada Trust Bank; UJF/Mitsubishi Tokyo Financial; HEXAL/Novartis; or Kellogg/Keebler. You can explore these mergers using Google searches such as "Kellogg Keebler merger."

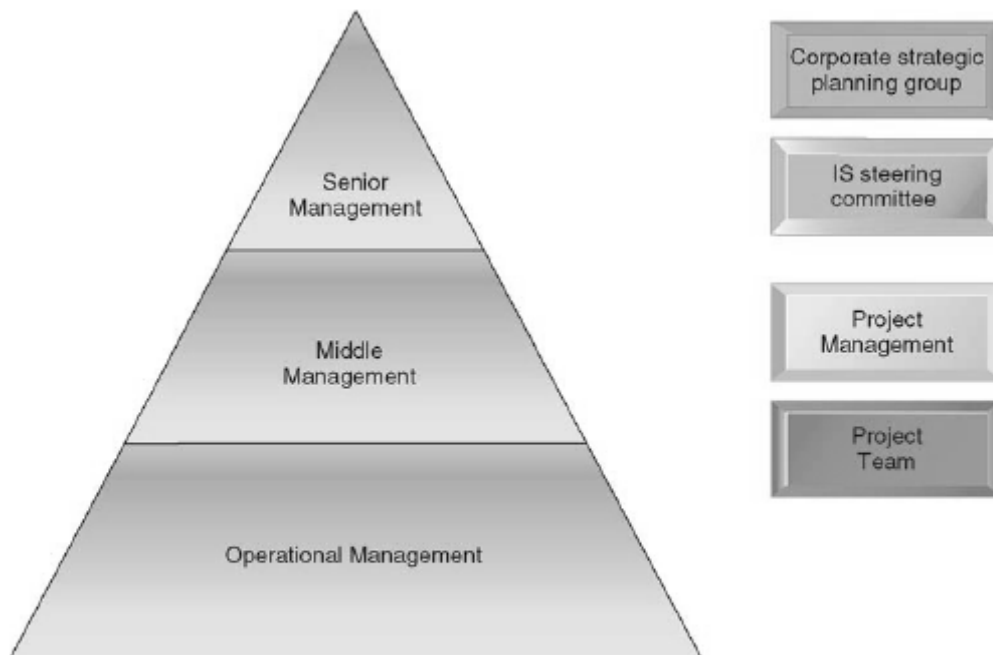
10.3 SELECTING PROJECTS

We are all familiar with having to make decisions and select ideas from a competing array of possibilities. For example, when students are working on a course assignment they are faced with having to make the most effective use of their time and to select ideas that will benefit them the most in accomplishing the goal. This is no different for companies. They typically are presented with many different projects for solving problems and improving performance. Firms need to identify and select from competing groups of ideas the one that promises them the greatest benefit and supports their business goals.

Management Structure for Information System Projects

Organizations need an information systems plan that describes how information technology supports the attainment of their business goals and documents all their system applications and IT infrastructure components. Large corporations will have a management structure to ensure the most important systems projects receive priority.

- Corporate strategic planning group — is responsible for developing the firm's strategic plan, which may require the development of new systems.
- Information systems steering committee — is the senior management group with responsibility for systems development and operations.
- Project team — is supervised by a project management group composed of information systems managers and end-user managers responsible for overseeing several specific information systems projects.



Each level of management in the hierarchy is responsible for specific aspects of systems projects, and this structure helps give priority to the most important systems projects for the organization.

Linking systems projects to the business plan

Organizations need to ensure that their hardware and software systems fit in with their organizational **information systems plan** and their people know how to use them. A good information plan will help companies systematically figure out what they need to get the job done and whether all the hardware and software is necessary and if they really do meet the requirements of the organization. A good information plan will also take personnel needs into account. The problem is that too many companies don't have a plan for integrating new hardware and software purchases into their overall business plan. Of

course, the information plan should support the overall business plan and not conflict with it. The plan must include all levels of the organization, including the strategic and executive levels. These two levels contain the people who often say they are exempt from having to determine information system needs.

CRITICAL SUCCESS FACTORS

Critical Success Factors (CSFs) are simply the goals managers feel will make the organization a success. Using this method does broaden the scope of the analysis to include entire industries, the broader environment in addition to the firm itself and its managers. That's why it's called "strategic analysis." Basically, you contact several top managers, ask them what they think will make the organization succeed, and then combine the results into a cohesive picture.

What makes this method work is that you have a much smaller sampling of data with which to develop an information plan. It's faster than enterprise analysis and therefore a little cheaper. And your plan revolves around just a few CSFs instead of a whole slew of information requirements.

Using the CSF method also takes into account how the external business environment affects information needs, which is a tough question nowadays. Usually top management, the organizational level most involved in this type of analysis, has a better idea of the environmental effects than lower levels of management.

With all its advantages, there are some distinct disadvantages to this approach. Chief among them is that only a small group is interviewed. Their biases then become the biases of the system. How do you formulate the opinions of these few managers into an organization-wide plan? How aware of common tasks at the lower levels of the organization are the top managers? Are you sure managers' goals represent the organization's goals? Just because this level of management may be more aware of the external environment doesn't make the plan immune to change. That has never been truer than in today's rapidly changing world.

CSFs can be a good start to analyzing a company's organizational needs, but they shouldn't be the only methodology used.

PORTFOLIO ANALYSIS

All of the financial models used to evaluate the new system are positive and indicate that this is a fairly sound project for the company to undertake. But what if some of the models had indicated the opposite? Would that automatically doom the project? Not necessarily. Sometimes an organization may want to implement a new system for strategic or competitive reasons even if the financial models disagree.

You'll also have some non-financial considerations and some strategic decisions to make. Many corporations are struggling with these considerations as they try to develop Internet

applications. Most companies doing business on the Internet aren't making money — they're losing money, and sometimes at alarming rates. But they've made the decision that the Web-based applications are necessary and they are willing to absorb the financial loss in return for the long-term strategic gain.

The **portfolio analysis** allows a company to objectively rate multiple projects for their risk and potential benefits. Companies too often get locked into just one idea without understanding that multiple choices exist.

SCORING MODELS

The **scoring model** discussed in the text is very effective for comparing various alternatives in terms of their costs. This model can go a long way toward helping organizations determine the best course of action and quantify their decision making. And, if nothing else, it creates a dialogue among the managers about strategic factors they should consider for the good of the firm. As the text states, "Scoring models are used most commonly to confirm, to rationalize, and to support decisions, rather than as the final arbiters of system selection."

10.4

ESTABLISHING THE BUSINESS VALUE OF INFORMATION SYSTEMS

When discussing this concept with your students, encourage them to see that information systems have both tangible and intangible benefits and costs associated with their development. As a very simple example, you can use the purchase of a home computer system. Ask your students to discuss the benefits and costs associated with this purchase. You can use this discussion as a launching pad for a discussion about the section's concepts.

Your students should easily grasp the necessity of identifying financial benefits and costs, and thus will understand the use of the chapter's models. One area that is sometimes hard for students to grasp is the identification of the benefits and costs, as well as the time value of money. You can use Table 10-3 to help identify concrete cost and benefit areas. Be sure to spend a few minutes discussing why an organization should not base its project decisions solely on financial models.

Stress that net present value and internal rate of return should be used to analyze an information system, just as any other capital budgeting decision. The question of correctly assessing benefits is a difficult one. Too often, organizations use only cost savings in cost/benefit and capital budgeting. Many of the examples we have seen in the cases and windows boxes are of systems giving access to new business or new ways of producing, not just reducing costs. Portfolio analysis and scoring models are ways of trying to include more than just cost savings.

Information system costs and benefits

One of the more difficult choices to make when evaluating new systems is to determine the **tangible benefits** versus **intangible benefits**. When a financial institution must decide whether to offer online banking, it may evaluate the system using one of the methods outlined in the text and determine that it will cost half a million dollars to implement. The immediate cost savings of not having employees interface directly with customers may be only \$250,000. On the surface you could say that the new system isn't worth the cost — the bank will lose \$250,000. But the intangible benefits the bank customers may enjoy could potentially be worth a million dollars. In that case, the new system's intangible benefits will far exceed the tangible benefits.

Capital budgeting for information systems

The Learning Track for this chapter presents different methods for analyzing a new system in terms of dollars and cents (**capital budgeting**). Each method measures the financial worth of the system by determining the difference between cash outflows and cash inflows.

The principal capital budgeting models for evaluating information technology projects are:

- The payback method
- The accounting rate of return on investment (ROI)
- The net present value (NPV)
- The internal rate of return (IRR)

Real Options Pricing Models

The system investment that looks good to one company may be all wrong for another company based strictly on the numbers. That's because no two companies are *exactly* the same. And the uncertainty of most IT projects makes it even more difficult to evaluate a project based solely on numbers. **Real options pricing models (ROPMS)** offers strategic planners the ability to bring other factors into the evaluation and place a value on them. It uses these factors:

- Value of the underlying IT asset
- Volatility of the value
- Cost of converting the option investment into the underlying asset
- The risk-free interest rate
- The options' time to maturity

Limitations of financial models

Keep in mind that there are limitations to each financial model used to evaluate new systems. Using the online banking example, you can assume the initial cost will not be recouped until months or years after implementation. As we've seen in the last few years, the hardware costs can change drastically within a short period of time. As soon as the system is installed, new technology can render it obsolete. How do you factor those realities into a financial evaluation model?

On the other hand, as previously discussed, the costs of adding new users to an existing network are marginal according to Metcalfe's Law and Network Economics. That must be factored into the financial models as well as elements of the TCO (Total Cost of Ownership). It is not unusual for the personnel costs in the TCO model to be underestimated or even totally overlooked.

10.5 | MANAGING PROJECT RISK

Information system risks and risk assessment were covered in Chapter 8. In this section we will concentrate on discussing the specific risks to information systems projects and show what can be done to manage them effectively.

Dimensions of project risk

The more complex, the more risk. That's pretty easy to understand, but harder to manage. Risks associated with the project should be clearly outlined and discussed. The three major risks are:

- *Project size*
- *Project structure*
- *Experience with technology*

The bigger the project size, the bigger the challenge. It's pretty evident that managing two or three people working on a small system development project is easier than managing 20 people working on a huge project that will envelop the entire organization. The more structured the project, the more people will understand what is expected of them. The more people know, understand, and are familiar with the hardware and software, the easier implementation will be.

Change management and the concept of Implementation

Consider supplementing the reading with Dr. Paul Lawrence's 1954 article of "Resistance to Change" and his revisiting of the subject in the *Academy of Management Journal* in 1969. Have students research the Web for recent articles on change

management. Has change management theory changed much since Dr. Lawrence's 1954 article? Students always find it interesting just how true his article rings today!

Change management involves managing the impact of organizational change associated with an innovation, such as a new information system.

The Concept of Implementation

Implementation of a new system is *not* just about how to put the hardware and software into place. You have to address and manage the personnel element and make sure that it is in sync with the hardware and software. In essence you become a **change agent**. You have to convince users that the system is going to improve their work world and that the new will be better than the old. If people are going to lose their jobs because of the new system or if they are going to experience a significant difference in responsibilities, you must be clear in communicating with them.

The Role of End Users

Make users feel they own the new system instead of it being an enemy or something they should fear. That's why we stress user involvement through the entire development process. The new system shouldn't be a surprise on Monday morning! Familiarity doesn't always breed contempt; it should breed acceptance when it comes to new information systems.

As a manager, your job is to bridge the **user-designer communications gap** to help ensure success of the new system. Too little discussion and communication between the techies and the non-techies will be apparent through design flaws and a poorly implemented project. Understand where both sides are coming from, and you'll do a better job of getting them to work together. You can never have too *much* communication.

Management Support and Commitment

If managers don't like the new system or fear it, then how in the world can you expect the workers to accept it? The best way to get managers to like, support, and fund the new system is to communicate with them every step of the way. Make sure they know what's going on. After all, managers are people too, and they have the same fears as anyone else.

Change Management Challenges for Business Process Reengineering, Enterprise Applications, and Mergers and Acquisitions

The business world is fraught with examples of mergers and acquisitions that didn't work out or were not cost effective. Many of the problems can be traced to employees that didn't adapt to the changes or to poorly integrated systems. To affect a successful merger managers must recognize:

- The realistic costs of integration
- The estimated benefits of economies in operation scope, knowledge, and time
- Any problematic systems that require major investments to integrate
- Any likely costs and organizational changes required to upgrade the IT infrastructure

Bottom Line: How well changes in an organization caused by implementation of a new system are managed can spell success or failure. Problem areas are in the design, data, cost, and operations areas. The causes of implementation success and failure are user involvement and influence, management support and commitment, level of complexity and risk, and the management of the implementation process. Mergers and acquisitions offer unique challenges to companies, not only with hardware and software issues, but also with human resource issues.

Controlling risk factors

There is risk in everything you do. The smallest project has risk. Understanding and managing risk, especially when it comes to people, will help you succeed.

Managing Technical Complexity

You can use special tools to help you manage the implementation of a new information system (**internal integration tools**). If nothing else, these special tools will help you communicate with everyone on the implementation team and in the organization as a whole. Use your organization's intranet as much as possible to communicate and inform.

Formal Planning and Control Tools

Automated management tools such as **PERT** or **Gantt charts** (formal planning and control tools) can also help you manage a complex project. They are extremely beneficial for scheduling events and tracking the hundreds of details involved.

PROJECT MANAGEMENT SOFTWARE TOOLS

Commercial software tools that automate many aspects of project management facilitate the project management process. Project management software typically features capabilities for:

- Defining and ordering tasks
- Assigning resources to tasks
- Establishing starting and ending dates to tasks
- Tracking progress
- Facilitating modifications to tasks and resources.
- Many automate the creation of Gantt and PERT charts.

Increasing User Involvement and Overcoming User Resistance

Use the **external integration tools** to keep people involved and informed. Guard against destructive, although innocent, sabotage of the system (**counterimplementation**).

Remember, people will weigh their own needs against those of the organization. You have to make sure the two agree as much as possible.

Designing for the Organization

“Just what will this new system do for us?” That’s a very appropriate question but unfortunately, it’s often ignored. Everyone seems to get caught up in the hustle and bustle of the implementation process and they forget to address the organizational impact analysis. We urge you to write down what you want the end result to be in terms of the organization. If you do so, you can use these notes as the basis for your impact analysis. The analysis can also be a great communication tool to explain to people how their jobs will be affected, to explain the changes required, and to help them plan the individual efforts required for a successful new system.

Even though we’re discussing the human element at the end of the chapter, please don’t get the impression that you should wait until the end to give it your full attention. In fact, it should be at the top of your list throughout the entire implementation process so that it is incorporated into every facet of the new system.

How will the new system fit into the human element? That’s the idea behind **ergonomics**; getting human and machine to agree and complement each other.

Sociotechnical Design

Unless you design a system that will be totally controlled and operated by robots, you must pay attention to the **sociotechnical design** of your system. Simply stated, this means how the technical aspects of your system will fit in with the human aspects.

Bottom Line: Managing the change in the organizational structure that results from implementing a new system is as important as managing the system itself. Use the appropriate internal and external integration tools to control the risk factors. Design the system implementation with the whole organization in mind allowing mostly for the human factor.

WINDOW ON ORGANIZATIONS: WHY CAN'T BIOSENSE TAKE OFF?

TO THINK ABOUT QUESTIONS

1. Identify the risks in the BioSense project.

The BioSense program sits atop a hospital’s existing information systems, continually gathering and analyzing data as they are generated. Custom software developed by the

CDC monitors a facility's network traffic and captures relevant patient records, diagnoses, and prescription information. The system summarizes and presents analytical results by source, day, and syndrome for each ZIP code, state, and metropolitan area using maps, graphs, and tables.

Risks include:

Project size: *The larger the project, the greater the risk.* The sheer number of hospitals that the CDC wants to incorporate into the system is enormous. Approximately 700 Defense Department and 1110 VA facilities already report data to BioSense. It also receives data from Laboratory Corporation of America (LabCorp) orders for medical tests. LabCorp is one of the largest clinical lab service providers in the U.S. As of May, 2008, only 563 hospitals and state health organization were participating in BioSense – out of thousands.

Project structure: *Projects that are more highly structured than others stand a better chance of success.* It appears that the BioSense project still has relatively undefined, fluid, and constantly changing requirements and users who cannot agree on what they want. The BioSense project began in 2005. On May 3, 2006, the U.S. government issued an implementation plan for the project. It called for improved coordination among federal, state, and local authorities and the private sector for pandemics and other public health emergencies. However, it appears that the implementation plan was not coordinated with everyone who was supposed to participate. In 2007, the CDC decided to work with state and local public health care systems instead of competing with them. It has retreated to using BioSense in a limited form while simultaneously pursuing information-sharing measures with state health departments. The CDC will only encourage states to move their detailed data into a national repository instead of requiring it. The final design of the system is still unclear. The CDC is piloting different strategies to determine the best approach.

Experience with technology: *A project's risk rises if the project team and the information system staff lack the required technical expertise.* Each hospital must standardize patient and other medical data. CDC's contractors would have to work with each hospital to translate its data codes into the standards used by CDC's software. This is a massive task, given hospitals' limited IT staffs and resources.

2. What management, organization, and technology factors explain why this project has been difficult to implement?

Management: Apparently the intended users of the BioSense system – hospitals and state health organizations – were not part of the design and implementation planning activities. CDC management has since changed how it will encourage users to join the system. The final design of the system is still unclear. CDC management did not account for political changes the new system would cause.

Organization: Hospitals are reluctant to sign up for the new system because of concerns about maintaining privacy and security of patient information. The BioSense system would also let CDC “listen in” on patient treatments on a real-time basis. Physicians and health officials resent the system because it enables the federal government to encroach on what has traditionally been the domain of local health care providers and organizations.

Technology: Coding systems used by the BioSense project don't match coding systems used by hospitals and state health organizations. The data codes have to be translated into the standards used by the CDC's software.

3. Is the CDC's new approach to improving pandemic warnings a viable solution? Why or why not?

Student opinions will vary. However, they should include elements such as the opinion of Dr. John Rosenberg, director of the Infectious Disease Laboratory at the State of California's Department of Health Services in Richmond, CA – if an epidemic broke out, “You'd know it before the data rolled in. When your emergency rooms fill up you make a phone call; this is probably a better measure.” On the other hand, the CDC is focusing on building an alert system to notify state and regional public health care officials electronically about pandemic outbreaks instead of relying on e-mail or the telephone.

4. Is a system like BioSense a good idea for Canadian health care? What can Canadian health officials learn from the BioSense project to help them implement a system like BioSense?

The system would be useful in situations of pandemic preparedness and response, such as during the outbreak of H1N1, and the vaccination programs. The problems that the US system had with acceptance would be expected in Canada as well. Making sure the interface was adaptable to different reporting systems would be critical; for example, it might be useful to have a middleware product that would collect and collate the data from the systems.

In addition, we would expect there to be equal if not greater concern over privacy and anonymity of data. It would be useful to have clearly defined needs of which data are needed: if only aggregate data are needed, then the system should not collect individual data records.

MIS IN ACTION QUESTIONS

Explore the BioSense Web site (www.cdc.gov/biosense) and then answer the following questions.

1. What information technologies do you see mentioned in the description of BioSense? Why would they be especially useful for this type of application?

(Copied from the BioSense Web site, January 2010. Technology is bolded)

Major Initiatives

- Integrating partners in the development of the Geocoded Interoperable Population Summary Exchange (GIPSE) standard that will enable summary level data exchange and interoperability with the National Health Information Network (NHIN).
- Developing the appropriate tools for viewing and publishing Geocoded Interoperable Population Summary Exchange (GIPSE) data across jurisdictions.
- Establishing a network of partners (e.g. Regional Collaboratives, RODS, ESSENCE, and Denver Public Health) who share Geocoded Interoperable Population Summary Exchange (GIPSE) data across jurisdictional boundaries.
- Extending the NHIN platform by providing population health queries using the GIPSE standard.
- Expand acceptance of **Geocoded Interoperable Population Summary** (GIPSE) by transitioning to a Federal Health Architecture profile to be used throughout the NHIN for summary level data access.
- Piloting an **open source service platform** with a state health department that will allow healthcare organizations to share data with public health departments while maintaining sole proprietorship over the data.
- Supporting Health Information Exchanges (HIEs) to provide public health access to rich clinical data sets and furthering integration with the NHIN.
- Awarding additional Centers of Excellence to continue furthering the science of biosurveillance.

BioSense receives, analyzes, and evaluates health data from numerous data sources such as emergency rooms, ambulatory care clinics, and clinical laboratories.

2. On the BioSense Website, click on Application Access and Support. How can an organization gain approval to access BioSense? What does the section on Building the Power of Technology tell you about the guiding philosophy behind BioSense?

From the website, accessed Jan 2010: Application Access & Support

How do I get access?

Every state and local public health department has a BioSense administrator responsible for granting access to the application and the appropriate data.

- State level users are granted access to view BioSense data from their state

- Local public health users are granted access only to the cities or metropolitan reporting areas (MRAs) within their jurisdiction.

Each healthcare system transmitting real-time data through BioSense also has a BioSense administrator who is responsible for granting access to the application for users within the hospital.

- Local users whose jurisdictions do not fall within a BioSense MRA can be granted access to state or zip code level data if approved by the state BioSense administrator. In addition, user-requested customized metropolitan areas or regions can be created using sets of zip codes.

To obtain the contact information for the appropriate BioSense administrator for your jurisdiction, send an email request to BioSenseHelp@cdc.gov.

What is the process for obtaining access?

Upon approval from the local BioSense administrator via CDC's Secure Data Network (SDN). The SDN ensures that the parties who access any sensitive electronic transaction are who they claim to be. It supports bilateral authentication in which both users and programs can be certain that they are connected to or are communicating with the correct uniquely identified individual or entity, and it provides for multi-step electronic trust relations supported by industry-standard Certificate Authority services.

Building the Power of Technology

The BioSense program is currently focusing on the use of grid technology. A “grid” is a way to connect multiple computers, across the country to allow data sources to share and view large amounts of health information. Technological advances will allow grid participants to analyze data in other jurisdictions without moving the actual data, which is an important step forward in overcoming policy barriers to moving data out of a jurisdiction. Grid technology benefits public health by:

- Reducing redundant data collection
- Allowing secure, controlled views of data
- Avoiding costly investments in processors or data libraries

This tells us that BioSense is responding to concerns over data collection and privacy.

SUMMARY

1. What are the various components of information resource management and the issues involved in each component?

The IS department may be structured in any of several ways: centralized as its own department, decentralized within other departments, or with personnel located both

centrally and in various information service units and information centres. The CIO and MIS Steering Committee set IS policies and prioritize and review major projects. IS planning takes place at the strategic, tactical, and operational levels and should be aligned with organizational strategy at each level.

Systems development actually involves a number of IS personnel roles and includes the staff assignments to various projects as well as ensuring that security issues are addressed. IS personnel must be recruited, hired, retained, and evaluated and must be permitted to keep their skill sets up to date. Like every other department in an organization, the IS department must set a budget, which is difficult given the trend toward rapidly changing technology and escalating IS personnel salaries.

2. What are the objectives of project management and why it is so essential in developing information systems?

A high percentage of information systems projects take more time and money to implement than originally anticipated or are delivered with missing functionality. Good project management is essential for ensuring that systems are delivered on time and on budget and provide genuine business benefits. Project management activities include planning the work, assessing the risk, estimating and acquiring resources required to accomplish the work, organizing the work, directing execution, and analyzing the results. Project management must deal with five major variables: scope, time, cost, quality, and risk.

3. What methods can be used for selecting and evaluating information systems projects and aligning them with the firm's business goals?

Organizations need to identify and select IS projects that best support their business goals. They need an information systems plan that describes how information technology supports the attainment of their business goals and documents all their system applications and IT infrastructure components. Large corporations will have a management structure to ensure the most important systems projects receive priority. Once strategic analyses have determined the overall direction of systems development, enterprise analysis, critical success factors, portfolio analysis, and scoring models can be used to identify and evaluate alternative information systems projects.

4. How can firms assess the business value of information systems?

Information systems provide business value for a firm in many different ways, including increased profitability and productivity. Some, but not all, of these business benefits can be quantified and measured. Capital budgeting models are used to determine whether an investment in information technology produces sufficient returns to justify its costs. The principal capital budgeting models for evaluating systems projects are the payback method, accounting rate of return on investment (ROI), net present value, and internal rate of return (IRR). Real options pricing

models, which apply the same techniques for valuing financial options to systems investments, can be useful when considering highly uncertain IT investments.

5. What are the principal risk factors in information systems projects?

The level of risk in a systems development project is determined by three key dimensions: (1) project size, (2) project structure, and (3) experience with technology.

A very large percentage of information systems fail to deliver benefits or solve the problems for which they were intended because the process of organizational change surrounding system building was not properly addressed. IS projects are more likely to fail when there is insufficient or improper user participation in the systems development process, lack of management support, and poor management of the implementation process. There is a very high failure rate among business process reengineering and enterprise application projects because they require extensive organizational change that is often resisted by members of the organization. System changes resulting from mergers and acquisitions are also difficult to implement successfully because they usually require far-reaching changes to business processes.

6. What strategies are useful for managing project risk and system implementation?

Building an information system is a process of planned organizational change that must be carefully managed. The term implementation refers to the entire process of organizational change surrounding the introduction of a new information system. Especially important is the relationship between participants in the implementation process, notably the interactions between system designers and users. Eliciting user support and maintaining an appropriate level of user involvement at all stages of system building are essential.

Management support and control of the implementation process are essential, as are mechanisms for dealing with the level of risk in each new systems project. Project risk factors can be brought under some control by a contingency approach to project management. The risk level of each project determines the appropriate mix of external integration tools, internal integration tools, formal planning tools, and formal control tools to be applied. Appropriate strategies can be applied to ensure the correct level of user participation in the systems development process and to minimize user resistance. Information systems design and the entire implementation process should be managed as planned organizational change. Sociotechnical design aims for an optimal blend of social and technical design solutions.

KEY TERMS

The following alphabetical list identifies the key terms discussed in this chapter.

Accounting rate of return on investment (ROI) — calculation of the rate of return on an investment by adjusting cash inflows produced by the investment for depreciation. Approximates the accounting income earned by the investment.

Capital budgeting — the process of analyzing and selecting various proposals for capital expenditures.

Change agent — in the context of implementation, the individual acting as the catalyst during the change process to ensure successful organizational adaptation to a new system or innovation.

Change Management — given proper consideration to the impact of organizational change associated with a new system or alternation of an existing system.

Counterimplementation — a deliberate strategy to thwart the implementation of an information system or an innovation in an organization.

Critical success factors — a small number of easily identifiable operational goals shaped by the industry, the firm, the manager, and the broader environment that are believed to assure the success of an organization. Used to determine the information requirements of an organization.

Enterprise analysis — an analysis of organization-wide information requirements made by looking at the entire organization in terms of organizational units, functions, processes, and data elements; helps identify the key entities and attributes in the organization's data.

Ergonomics — the interaction of people and machines in the work environment, including the design of jobs, health issues, and the end-user interface of information systems.

External integration tools — project management technique that links the work of the implementation team to that of users at all organizational levels.

Formal control tools — project management technique that helps monitor the progress toward completion of a task and fulfillment of goals.

Formal planning tools — project management technique that structures and sequences tasks, budgeting time, money, and technical resources required to complete the task.

Gantt chart — lists project activities and their corresponding start and completion dates.

Implementation — Simon's final stage of decision making, when the individual puts the decision into effect and reports on the progress of the solution.

Information Resource Management — the process of managing information systems as an asset that is critical to the organization.

Information systems plan — a road map indicating the direction of systems development: the rationale, the current situation, the management strategy, the implementation plan, and the budget.

Intangible benefits — benefits that are not easily quantified; they include more efficient customer service or enhance decision making.

Internal integration tools — project management technique that ensures that the implementation team operates as a cohesive unit.

Internal rate of return (IRR) — the rate of return or profit that an investment is expected to earn.

Net present value — the amount of money an investment is worth; taking into account its cost, earnings, and the time value of money.

Organizational impact analysis — study of the way a proposed system will affect organizational structure, attitudes, decision making, and operations.

Payback method — a measure of the time required to pay back the initial investment on a project.

PERT chart — graphically depicts project tasks and their interrelationships. The PERT chart lists the specific activities that make up a project and the activities that must be completed before a specific activity can start.

Portfolio analysis — an analysis of the portfolio of potential applications within a firm to determine the risks and benefits and to select among alternatives for information systems.

Present value — the value in current dollars of a payment or stream of payments to be received in the future.

Project — is a planned series of related activities for achieving a specific business objective.

Project management — refers to the application of knowledge, skills, tools, and techniques to achieve specific targets within specified budget and time constraints.

Real options pricing models (ROPs) — models for evaluating information technology investments with uncertain returns by using techniques for valuing financial options.

Scope — defines what work is or is not included in a project.

Scoring model — a quick method for deciding among alternative systems based on a system of ratings for selected objectives.

Sociotechnical design — design to produce information systems that blend technical efficiency with sensitivity to organizational and human needs.

Tangible benefits — benefits that can be quantified and assigned a monetary value; they include lower operational costs and increased cash flows.

User-designer communications gap — the difference in backgrounds, interests, and priorities that impede communication and problem solving among end users and information systems specialists.

User interface — the part of the information system through which the end user interacts with the system; type of hardware and the series of on-screen commands and responses required for a user to work with the system.

REVIEW QUESTIONS

1. **What are the various components involved of information resource management and the issues involved in each component?**

Name and describe the components involved in information resource management.

The components involved in information resource management are: the IS department where most of the information systems development and computer operations occur; the management, planning, strategy, and external relations needed for information systems development and computer operations; management of systems development; management of IS personnel; and management of IS budgets.

Compare the role of the CIO with that of the MIS steering committee.

The CIO is a member of the MIS steering committee. The CIO's role is the strategic level manager for information systems. The MIS steering committee sets policy and priorities for the IS department, including approving high-level budgets for the IS department.

Name and describe the types or levels of IS planning.

Strategic level IS plans describe from a broad perspective the major information systems that support or will support the organization's strategy. Tactical IS plans have a shorter focus and concentrate on breaking down the strategic IS plan into more detailed plans for middle managers to implement. Operational level IS plans detail how the strategic IS plan that has been translated into tactical IS plans, will be implemented over the short term.

Name and describe the various roles IS personnel have in the IS department.

Systems operators run the hardware. Data entry operators enter data into machine readable format. Network managers ensure the networks are operational, including most often handling network security. Web masters handle the organization's Web sites, including intranets.

2. What are the objectives of project management, and why is it so essential in developing information systems?

Describe information systems problems resulting from poor project management.

When an information system fails to work properly or costs too much to develop, companies may not realize any benefit from their information system investment, and the system may not be able to solve the problems for which it was intended. Good project management is essential for ensuring that systems are delivered on time, on budget, and provide genuine business benefits.

A high percentage of information systems projects take more time and money to implement than originally anticipated or are delivered with missing functionality. A systems development project without proper management will most likely suffer these consequences:

- Costs that greatly exceed budgets
- Unexpected time slippage
- Technical performance that is less than expected
- Failure to obtain anticipated benefits

Define project management. List and describe the project management activities and variables addressed by project management.

Project management refers to the application of knowledge, skills, tools, and techniques to achieve specific targets within specified budget and time constraints. Project management activities include planning the work, assessing the risk, estimating and acquiring resources required to accomplish the work, organizing the work, directing execution, and analyzing the results. Project management must deal with five major variables:

- **Scope:** defines what work is or is not included in a project
- **Time:** the amount of time required to complete the project
- **Cost:** based on the time to complete a project multiplied by the cost of the human resources required to complete the project.
- **Quality:** an indicator of how well the end result of a project satisfies the objectives specified by management
- **Risk:** refers to potential problems that would threaten the success of a project

3. What methods can be used for selecting and evaluating information systems projects and aligning them with the firm's business goals?

Name and describe the groups responsible for the management of information systems projects.

Large corporations will have a management structure to ensure the most important systems projects receive priority.

- **Corporate strategic planning group:** responsible for developing the firm's strategic plan, which may require the development of new systems.
- **Information systems steering committee:** the senior management group with responsibility for systems development and operations. It's composed of department heads from both end-user and information systems areas. The committee reviews and approves plans for systems in all divisions, seeks to coordinate and integrate systems, and occasionally selects specific information systems projects.
- **Project management group:** composed of information systems managers and end-user managers, this group is responsible for overseeing specific information systems projects.
- **Project team:** is directly responsible for individual systems projects. It consists of systems analysts, specialists from the relevant end-user business areas, application programmers, and database specialists.

Describe the purpose of an information systems plan and list the major categories in the plan.

An information systems plan helps executives, managers, and users identify information systems projects that will deliver the most business value. The information systems plan must support the overall business plan. It serves as a road map indicating the:

1. purpose of the plan
2. strategic business plan rationale
3. current systems
4. new developments
5. management strategy
6. implementation plan
7. budget requirements

The major categories of an information systems plan are further broken down in Table 10–1.

Explain how critical success factors, portfolio analysis, and scoring models can be used to select information systems projects.

Critical success factors (CSFs) help an organization clearly understand both its long- and short-term information requirements. CSFs are shaped by the industry, the firm, the manager, and the broader environment. This method uses personal interviews with top managers to identify their goals and the resulting CSFs are aggregated to develop a picture of the firm's CSFs. Only top managers are interviewed which may skew the results since there is no particularly rigorous way in which individual CSFs can be aggregated into a clear company pattern. Another drawback to this method of evaluating projects is that individual and organizational CSFs are often confused with each other.

Portfolio analysis is used to help evaluate alternative system projects. Portfolio analysis inventories all of the firm's information systems projects and assets, including infrastructure, outsourcing contracts, and licenses. Firms try to improve the return on their information system portfolios by balancing the risk and return from their systems investments. By using portfolio analysis, management can determine the optimal mix of investment risk and reward for their firms, balancing riskier, high-reward projects with safer, lower-reward ones.

Scoring models are useful when many criteria must be considered. It assigns weights to various system features and then calculates the weighted totals. The scoring model requires experts who understand the issues and the technology. Often the most important outcome of a scoring model is not the score but agreement on the criteria used to judge a system. It helps confirm, rationalize, and support decisions, rather than serve as the final arbiter of the system selection process. Table 10-2 can be used to explain how a simple scoring system works.

4. How can firms assess the business value of information systems projects?

List and describe the major costs and benefits of information systems.

Table 10-3 lists all of the major costs and benefits of information systems. It divides the costs among five system components: hardware, software, telecommunications, personnel, and services. Some of the tangible benefits include increased productivity, lower operational costs, and a reduced workforce. Among the intangible benefits are improved organizational planning, more timely information, improved decision making, and increased job satisfaction.

Distinguish between tangible and intangible benefits.

Students can use Table 10-3 to answer this question.

Tangible benefits can be quantified and assigned a monetary value. They include: increased productivity, lower operational costs, reduced workforce, lower computer expenses, lower outside vendor costs, lower clerical and professional costs, reduced rate of growth in expenses, reduced facility costs, and increased sales.

Intangible benefits cannot be immediately quantified but may lead to quantifiable gains in the long run. They include: improved asset utilization, improved resource control, improved organizational planning, increased organizational planning, increased organizational flexibility, more timely information, more information, increased organizational learning, legal requirements attained, enhanced employee goodwill, increased job satisfaction, improved decision making, improved operations, higher client satisfaction, and better corporate image.

Explain how real options pricing models can help managers evaluate information technology investments.

Appropriate strategies, such as real options pricing models (ROPM), can be applied to evaluate and value the information system when the benefits cannot be established in advance. Real options pricing models apply the same techniques for valuing financial options to systems investments and can be useful to help managers think about the potential value of highly uncertain IT investments. ROPM allows managers to systematically take into account the volatility in the value of IT projects over time, the optimal timing of the investment, and the changing cost of implementation as technology prices fall over time. The disadvantages of this model are primarily in estimating all the key variables, especially the expected cash flows from the underlying asset, and changes in the cost of implementation.

5. What are the principal risk factors in information systems projects?

Identify and describe each of the principal risk factors in information systems projects.

Project size: the larger the project (dollars spent, the size of the implementation staff, the time allocated, and the number of organizational units affected), the greater the risk. The larger the project, the higher the failure rate. There are few reliable techniques for estimating the time and cost to develop large-scale information systems.

Project structure: Highly structured projects usually have clear and straightforward requirements, therefore outputs and processes are easily defined. Users know exactly what they want and what the system should do; there is almost no possibility of users changing their minds.

Experience with technology: The less experience the project team has with hardware, system software, application software, or database management system, the higher the risk of project failure.

Explain why builders of new information systems need to address implementation and change management.

An information system is a sociotechnical entity, an arrangement of both technical

and social elements. Information systems change involves hardware and software, but in addition, it involves changes in jobs, skills, management, and organization. When we design a new information system, we are redesigning the organization, reordering its technical and social elements. Change management addresses these types of changes, or more directly, the effects of the changes on the people whose jobs will change. The system not only changes the technology and the organization, it also changes people, and the project must also address this aspect if it is to succeed.

Explain why eliciting support of management and end users is so essential for successful implementation of information systems projects.

The user-designer communication gap deals with the relationship that exists between end users and information systems specialists. These two groups have different backgrounds, interests, and priorities and has traditionally been a problem for information systems implementation efforts. These differences create user-designer communications gaps. Information systems specialists often have a highly technical orientation to problem solving, focusing on technical solutions in which hardware and software efficiency is optimized at the expense of ease of use or organizational effectiveness. End users prefer systems that are oriented toward solving business problems or facilitating organizational tasks.

Explain why there is such a high failure rate for implementations involving enterprise applications, business process reengineering, and mergers and acquisitions.

These projects are very challenging, partly because they usually require extensive organizational change. They also often replace deeply entrenched old technologies and legacy systems. Many are undermined by poor implementation and change management practices. The project must address employee concerns about the change, their fears and anxieties, resistance by key managers, changes in job functions, career paths, and recruitment practices.

A major reason for merger and acquisition failures is the difficulty in integrating the information systems of the different companies. Combining the different systems usually requires considerable organizational change and complex system projects to manage the change. Unless the integration of the systems is successful, the expected benefits of the merger or acquisition will not be achieved.

6. What strategies are useful for managing project risk and system implementation?

Identify and describe the strategies for controlling project risk.

Strategies you can follow to increase the chances of a successful system include:

- New systems that involve challenging and complex technology can be helped by recruiting project leaders with strong technical and administrative experience.

- If the firm does not have staff with the required technical skills or expertise, outsourcing or using external consultants are options that may be pursued.
- Using formal planning and control tools, such as Program Evaluation and Review Technique (PERT) or Gantt charts improve project management by listing the specific activities that make up a project, their duration, and the sequence and timing of task.
- Promote user participation by making user education and training easily available, and by providing better incentives for users who cooperate.
- Exercise sensitivity to ergonomic issues.
- Solve organizational problems prior to introducing new systems.

Identify the organizational considerations that should be addressed by project planning and implementation.

The term implementation refers to the entire process of organizational change surrounding the introduction of a new information system. Information systems design and the entire implementation process should be managed as planned organizational change using an organizational impact analysis. A very large percentage of information systems fail to deliver benefits or solve the problems for which they were intended because the process or organizational change surrounding system building was not properly addressed. The principal causes of information system failure are (1) insufficient or improper user participation in the systems development process, (2) lack of management support, (3) high levels of complexity and risk, and (4) poor project management.

Explain how project management software tools contribute to successful project management.

You can use special tools to help you manage the implementation of a new information system (internal integration tools). The software features these capabilities:

- Define and order tasks
- Assign resources to tasks
- Establish starting and ending dates to tasks
- Track progress
- Facilitate modifications to tasks and resources
- Automate the creation of Gantt and PERT charts
- Track the way changes in one aspect of a project affect others

If nothing else, these special tools will help you communicate with everyone on the implementation team and in the organization as a whole.

DISCUSSION QUESTIONS

1. How much does project management impact the success of a new information system?

Clearly, any project that is not properly thought out and managed will result in a dismal failure. Without proper management things quickly fall off the rails. Cost overruns mount, delays are unavoidable, frustration levels rise, and lack of commitment and belief in the product disappear, and so on. Success of any new information system is no different than planning for any other type of resource investment.

Murphy's Law is made for computers; whatever can go wrong, will go wrong. You have to anticipate problems and be ready to solve them. No system yet devised has been problem-free. If you understand and accept that implementing a new information system shouldn't be that much different from implementing any other type of new system in the organization, you can use many of the same principles to guide you through the process.

For instance, if you were changing a production line, you'd have certain plans for analyzing, designing, building, testing, training, and implementing the new tools or methods. If you are changing the process for enrolling employees in the company's new 401K plan, you'd have to make lots of decisions about the new process. The same thing holds true for implementing a new information system.

2. It has been said that most systems fail because system builders ignore organizational behaviour problems. Why might this be so?

System building efforts often fail because there is too much emphasis on the technology and not enough attention to changes in organizational structure, job design, workflows, and reporting relationships. Inattention to these issues often breeds resistance to a new system and may also produce a system that is incompatible with the organization. Conflicts between the technical orientation of system designers and the business orientation of end users must also be resolved for successful implementation of systems. The success or failure of organizational change can be determined by how well information systems specialists, end users, and decision makers deal with key issues at various stages of implementation.

COLLABORATION AND TEAMWORK: IDENTIFYING IMPLEMENTATION PROBLEMS

Form a group with two or three other students. Write a description of the implementation problems you might expect to encounter in one of the systems described in the Window on sections or chapter-ending cases in this text. Write an analysis of the steps you would take to solve or prevent these problems. If possible, use Google Sites to post links to web pages, team communications announcements, and work assignments; to brainstorm; and to work collaboratively on project

documents. Try to use Google Docs to develop a presentation of your findings for the class.

Answers for this project will vary. In addition to the models presented in this chapter, here are a few more suggestions for managing the implementation of information systems:

- Fully document the firm's applications and IT infrastructure and conduct periodic reviews of the firm's IT portfolio
- Ensure that information systems investments are closely aligned with the firm's business objectives.
- Project risks and returns should be clearly identified
- Continually measure the business value of new systems and weed out underperforming projects
- For large-scale projects, managers should assume an enterprise-wide focus, solve problems and meet challenges as they arise rather than simple meeting formal project milestones
- Emphasize learning as well as planning and adapt to unforeseen uncertainties and chaos
- Establish a separate office to manage subprojects and coordinate the entire project effort with other ongoing projects
- Coordinate the project with ongoing changes in the firm's business strategy, information technology infrastructure, and business processes

LEARNING TRACK MODULES:

1. *Capital Budget Methods for Information System Investments*
2. *Information Technology Investments and Productivity*
3. *Enterprise Analysis (Business System Planning)*

Students will find Learning Track Modules on these topics at the MyMISLab for this chapter.

HANDS-ON MIS: PROJECTS

Management Decision Problems

1. McDonald's Restaurants: the Innovate project was designed to create an intranet connecting headquarters with its 30,000 restaurants in 120 countries. It was meant to provide detailed operational information in real time. It was also intended to create a global ERP application touching the workings of every restaurant. Some restaurants were in countries that lacked network infrastructures. After spending over \$1 billion, including \$170 million on consultants and initial implementation planning, the project was terminated. What should management have known or done at the outset to prevent this outcome?

Using an information systems plan, corporate strategists and planners, along with the consultants, would have been required to evaluate current infrastructure capabilities (step 3), including hardware, software, database, and telecommunications and Internet availability. Those same four components would have again been evaluated under the new infrastructure capabilities required (step 4). At those two critical junctures, the company would have known about the countries that lacked network infrastructure. The consultants would have been able to determine if there were alternatives available in those countries or if they should be left out of the project's scope. Using the same information systems plan, the corporation would have been able to evaluate the entire project's scope, complexity, and risk to determine if the project was feasible and if it fit with the firm's strategic plan.

2. Caterpillar: the company wants to end its support for its Dealer Business System (DBS) which it licenses to its dealers to help them run their businesses. The software is becoming out of date and senior management wants to turn support over to Accenture Consultants. The dealers were never required to use the system but it had become a de facto standard for business processes. Approximately 250 dealers worldwide use some version of the system. Before Caterpillar turns the product over to Accenture, what factors and issues should it consider? What questions should it ask? What questions should its dealers ask?

Using an information systems plan, senior managers can analyze the idea of turning the system over to outside consultants and determine strategies for doing so. Step 2, Strategic Business Plan Rationale, requires managers to evaluate the current situation and business organization against changing environments. Using Step 3, Current Systems, Caterpillar executives, Accenture consultants, and a select number of dealers can determine the major systems for supporting business functions and processes and current infrastructure capabilities of dealers. It also requires them to evaluate anticipated future demands. Step 4, New Developments, allows Accenture and the dealers to understand the business rationale and the applications' role in strategy for the continued use of the system by dealers. They would also have to evaluate new infrastructure capabilities dealers would require, especially with software updates. Step 5, Management Strategy, and Step 6, Implementation Plan, require Accenture, dealers, and Caterpillar executives to understand and develop plans for migrating the system away from corporate use to the dealers.

IMPROVING DECISION MAKING: USING SPREADSHEET SOFTWARE FOR CAPITAL BUDGETING FOR A NEW CAD SYSTEM

Software skills: Spreadsheet formulas and functions

Business skills: Capital budgeting

Your company would like to invest in a new computer-aided-design (CAD) system that requires purchasing hardware, software, and networking technology, as well as expenditures for installation, training, and support. MyMISLab for this chapter contains tables showing each cost component for the new system as well as annual maintenance costs over a five-year period. You believe the new system will produce annual savings by reducing the amount of labour required to generate designs and design specifications, thus increasing cash flow. Using the data provided, create a worksheet that calculates the costs and benefits of the investment over a five-year period and analyzes the investment using the six capital budgeting models presented in this chapter. Is this investment worthwhile? Why or why not?

Data for this exercise can be found in the files named Ch10_Capital_Budgeting_CAD_Question.xls and Ch10_Capital_Budgeting_CAD_Question.pdf. Both files can be found in the Chapter 10 folder.

A solution can be found in the file named Ch10_CAD_Budget.xls, also in the Chapter 10 folder.

IMPROVING DECISION MAKING: USING WEB TOOLS FOR BUYING AND FINANCING A HOME

Software skills: Internet-based software

Business skills: Financial planning

You have found a new job in Calgary, Alberta, and would like to purchase a home in that area. Ideally, you would like to find a single-family house with at least three bedrooms and one bathroom that costs between \$150 000 and \$225 000 and finance it with a 30-year fixed rate mortgage. You can afford a down payment that is 20 percent of the value of the house. Before you purchase a house, you would like to find out what homes are available in your price range, find a mortgage, and determine the amount of your monthly payment. You would also like to see how much of your mortgage payment represents principal and how much represents interest. Use Yahoo!'s Real Estate site to help you with the following tasks:

- 1. Locate homes in your price range in Calgary, Alberta. Find out as much information as you can about the houses, including the real estate listing agent, condition of the house, number of rooms, and the school district.**
- 2. Find a mortgage for 80 percent of the list price of the home. Compare rates from at least three sites (use search engines to find sites other than Yahoo!, such as MLS sites).**
- 3. After selecting a mortgage, calculate your closing costs.**
- 4. Calculate the monthly payment for the mortgage you select.**
- 5. Calculate how much of your monthly mortgage payment represents principal and how much represents interest, assuming you do not plan to make any extra payments on the mortgage.**

When you are finished, assess the ease of use of the site and your ability to find information about houses and mortgages; the breadth of choice of homes and mortgages; and how helpful the whole process would have been for you if you were actually in the situation described in this project.

Naturally, your students will select different properties in the Calgary area. However, most will agree that the Yahoo! site is easy to use. Some of the common features of other sites they visit will have them complete an application and e-mail it to the lender. Phone numbers are available to talk to representatives. Payment information appears to be accurate and easy to use. The students might have some difficulty in finding closing cost information. Many of the closing costs will only be calculated a few minutes before the actual closing. You might suggest to the students that they NOT complete the application and e-mail it. This will cost the company additional money and resources; as well it could put the students on e-mail lists that they will not be interested in receiving.

CASE STUDY: CANADIAN GUN REGISTRY: A BOONDOGGLE OR SIMPLY A COMPLEX PROJECT

Read the case study and answer the following questions:

1. How important is the Canadian gun registry project for Canadian law enforcement? How does it impact decision making and operational activities?

Information on the gun registry can be found at the Government of Canada website <http://www.rcmp-grc.gc.ca/cfp-pcaf/faq/gen-eng.htm>

The answer to the question is riddled with political opinion on both sides of the issue. Students can search the web for information that supports the project or for information that says the gun registry is useless. It would be good to have students debate the usefulness of the system, focusing on the IS aspects.

Some sites of interest include Wikipedia: (this section copied Feb. 25, 2010)

Use of the registry

Police departments frequently use the Canadian Firearms Registry data base to allow police officers to check if a residence or property might contain a registered firearm before responding to a call. The gun registry has received support from the Canadian Association of Police Chiefs. Chief Jack Ewatski, president of the CACP, and Chief Armand LaBarge, president of the Ontario Association of Police Chiefs, stated that police officers across the country search the registry about 18 times per day. (Instead of the misled 9,400 a day where any personal information search is count as a hit)^[citation needed] However, most of those 5,000 queries are generated automatically when other queries are submitted to the CPIC system. In actual fact, as the Auditor General found, there is no reliable information to suggest how many times per day police officers intentionally access the firearms registry.^[citation needed]

The Canadian Firearms Centre says police make more than 13,000 queries to the system each week.

In a Canada Firearms Centre (CAFC) survey, 92% of general duty police officers stated that they use the system.

Gun registry effect on public safety

In a Canada Firearms Centre (CAFC) survey, 74% of general duty police officers stated that the registry "query results have proven beneficial during major operations."^[11]

However, the Auditor General's report found that the program does not collect data to analyse the effectiveness of the gun registry in meeting its stated goal of improving public safety. The report states:

The performance report focuses on activities such as issuing licenses and registering firearms. The Centre does not show how these activities help minimize risks to public safety with evidence-based outcomes such as reduced deaths, injuries and threats from firearms.^[12]

Ontario Provincial Police Commissioner Julian Fantino is opposed to the gun registry, stating in a press release:

We have an ongoing gun crisis including firearms-related homicides lately in Toronto, and a law registering firearms has neither deterred these crimes nor helped us solve any of them. None of the guns we know to have been used were registered, although we believe that more than half of them were smuggled into Canada from the United States. The firearms registry is long on philosophy and short on practical results considering the money could be more effectively used for security against terrorism as well as a host of other public safety initiatives."^[13]

Meanwhile, Edgar MacLeod, president of the Canadian Association of Chiefs of Police states that "while the cost of the registry had become an embarrassment, the program works and provides a valuable service. In a typical domestic violence situation, he says, investigating police officers rely on the registry to determine if guns are present. Onboard computers in police cruisers, or a call to central dispatch, alerts officers to any firearms registered to occupants of the house."^[9]

2. Evaluate the risks of the registry project and its key risk factors.

Risks include:

- Data integrity (is it accurate? is it complete?)
- Cost (who should pay? Does it provide return on investment)
- Benefits (how to measure? Can they be quantified?)
- Security (can it be accessed improperly?)
- Political (will it be supported regardless of government in power)

Key risks are those that relate to public safety (data integrity and security).

3. Classify and describe the problems the CFP faced in implementing its new registry system. What management, organization, and technology factors caused these problems?

Problems included:

- Incorrect (low) cost estimates
- No champion
- Technical issues (decision to develop software was costly)
- Incorrect data submitted by registrants
- No means to check accuracy of data
- Complex user interface (forms) drove users (registrants) away and created dissatisfaction
- Change in management (government)
- No clear benefits were demonstrated

Management: no clear champion; no oversight of project

Organization: change in management/government was disruptive

Technology: no security, poor user interface, no data integrity, complex software development

4. Describe the steps you would have taken to control the risk in this project.

Project was large (costly, impacted many people: high risk): Use formal planning and control tools such as Gantt charts, and MS-Project.

Project was loosely structured (requirements not clear, no management oversight: high risk): Have mechanisms to support external integration (high user involvement, from all user groups – government, law enforcement, community advocates, gun owners, lobbyists)

Technology experience (they used unfamiliar, custom software: high risk): use high internal integration tools such as having good project leaders who also understand technology)

5. If you were in charge of managing this project, what else would you have done differently to increase chances for success?

- Keep strict control over budget
- Use existing database software
- Look at other countries' successes/failures
- Break project down into smaller modules
- Have users involved in all stages, including testing/security
- And, use tools described in question 4.