

# Conceptualizing and Initializing The IT Project

## CHAPTER OVERVIEW

Chapter 2 describes how IT projects are conceptualized and initialized. After studying this chapter, you should understand and be able to:

- Define what a methodology is and describe the role it serves in IT projects.
- Identify the phases and infrastructure that make up the IT project methodology introduced in this chapter.
- Develop and apply the concept of a project's measurable organizational value (MOV).
- Describe and be able to prepare a business case.
- Distinguish between financial models and scoring models.
- Describe the project selection process as well as the Balanced Scorecard approach.

## GLOBAL TECHNOLOGY SOLUTIONS

Tim Williams sat across from Kellie Matthews as the waiter brought their orders and refilled the water glasses. After the waiter left, Tim handed a folder with GTS embossed on the cover to Kellie. "I've been giving this a great deal of thought," Tim said as he reached for the peppershaker. Kellie began to look over the contents of the folder while Tim waited.

"It's a methodology that I'm working on to help us organize the Husky Air project," Tim explained. "In fact," he added, "I think we can use it as a blueprint for all of our projects. Of course, I'm trying to make it flexible so we can add to it or change it over time as we learn better ways of doing things."

Kellie thought for a moment. "Will it restrict the project team's creativity?" she asked. "Husky Air's management is counting on us to come up with some innovative

solutions for them. I know I've always hated the feeling of being constrained by too many rules."

Tim was ready with his answer: "Think of this methodology as a road map. If you were planning a trip, the first thing you would have to do is decide on a destination based upon your interests. For our purposes, that would be similar to defining the project's goal. Once you decide where you're going, you then need to figure out how to get there and how much it will cost."

"Some kind of plan?" Kellie interjected.

"Exactly!" exclaimed Tim. "A travel plan would help you figure out whether to drive, fly, take a train, or use a combination to get to your destination. It really depends on where you're going and how much you want to spend."

Kellie reflected for a moment. "But when I'm on vacation, I like to be spontaneous!" she said. "Planning every minute of a vacation takes the fun out of it."

"Aha!" Tim replied. "You see that's the difference between a methodology and a plan. The methodology would help you to plan your plan."

"What?" said Kellie, "Are you playing a game with words?"

Tim grinned. "No, not really," he answered. "Let's say you went on vacation and had a terrible time. And maybe you even spent more than you budgeted for your vacation."

"I've had a few of those experiences," Kellie reflected.

"So the next time you decide to take a vacation, you might want to do things differently," Tim explained. "What you might do is organize the way you plan your vacation. First, you may try to come up with a better way of choosing a vacation spot. Then, you go about picking a mode of travel and reserve your accommodations. Finally, you figure out what you want to see and do while on your vacation. You may schedule your vacation by the minute, or you can have a list of places to visit or see while you're there—it really depends on what would make your vacation enjoyable."

The waiter returned and refilled their water glasses. Kellie thought for a moment. "I guess we really owe it to our client to have a game plan," she said. "After all, we can't really just wander in any direction and hope we'll somehow end up at our destination. They're paying us by the hour, and time is money. Besides, we owe it to them to meet their needs in the most efficient and effective way possible. So, what's our first step? We're meeting with Husky Air's management tomorrow morning."

"Glad you asked," Tim smiled. "If you take a look at the methodology, you'll see that the first thing we need to do is prepare a business case. That's where we'll figure out our destination—I mean, the overall goal of this project. Once we know where we're headed, we can identify several options for Husky Air. After one is approved, we'll develop a project charter and plan that defines the detailed schedule and budget. That will tell us what needs to be done, when, by whom, and how much it will cost. In addition, the methodology will help make sure that our plan is being followed, or changed when necessary."

"Sounds good," said Kellie, "But there's just one more thing."

"What's that?" asked Tim.

Kellie grinned. "It's your turn to buy lunch."

#### *Things to Think About:*

1. What are the advantages of having and following a project methodology?
2. Why should a methodology be flexible?
3. What perceptions might a client have if GTS has a methodology in place? If they don't?

## | INTRODUCTION

This chapter will introduce a framework for an IT project methodology that will be integrated into this text. A methodology provides a game plan for planning and managing the IT project and recommends the phases, steps, tools, and techniques to be followed and used throughout the project life cycle. All projects, however, are unique. A project methodology must be flexible in order to be useful. Moreover, a methodology should evolve to include the best practices that are derived from an organization's lessons learned. Over time, the methodology will better fit the organization and may even provide some kind of competitive advantage.

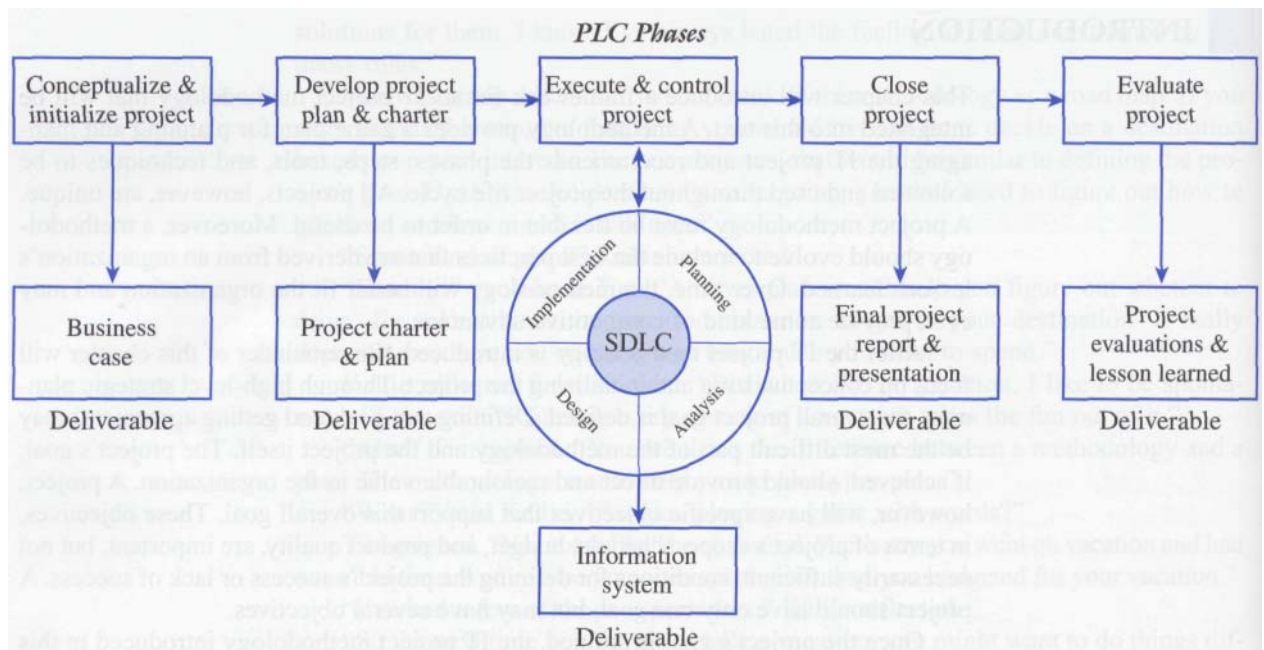
After the IT project methodology is introduced, the remainder of this chapter will focus on conceptualizing and initializing the project. Through high-level strategic planning, the overall project goal is defined. Defining this goal (and getting agreement) may be the most difficult part of the methodology and the project itself. The project's goal, if achieved, should provide direct and measurable value to the organization. A project, however, will have specific objectives that support this overall goal. These objectives, in terms of project's scope, schedule, budget, and product quality, are important, but not necessarily sufficient, conditions for defining the project's success or lack of success. A project should have only one goal, but may have several objectives.

Once the project's goal is defined, the IT project methodology introduced in this chapter recommends that the project team develop a **business case**. A business case is a deliverable that documents the project's goal, as well as several alternatives or options. The feasibility, costs, benefits, and risks for each alternative are analyzed and compared, and a recommendation to approve and fund one of the alternatives is made to senior management. The first phase of the IT project methodology, as in all of its phases, ends with a review of the project by the client or sponsor.

Most organizations have limited resources, and a particular project may have to compete with other projects within the organization for those resources. As a result, only one or a few select projects that make up the IT project portfolio can be funded at any given time. Therefore, many organizations have a formal selection process for taking on a project. This chapter will review some of the common techniques and tools for selecting IT projects. If a project has a clear and measurable goal that brings value to the organization, it will have a greater likelihood of being selected. Approval of the business case provides authority to proceed to the next phase of the methodology. This next phase focuses on developing a project charter and plan that details the organization of the project as well as its schedule and budget.

## AN INFORMATION TECHNOLOGY PROJECT METHODOLOGY (ITPM)

A **methodology** provides a strategic-level plan for managing and controlling IT projects. Think of a methodology as a template for initiating, planning, and developing an information system. Although information systems may be different, it is the product, and not necessarily the process, of managing the project that makes them different. As you can see in Figure 2.1, the methodology recommends the phases, deliverables, processes, tools, and knowledge areas for supporting an IT project. The key word is *recommends* because different types of projects, such as electronic commerce (EC), customer relations management (CRM), or data warehousing applications, may require different tools and approaches.



*IT Project Management Foundation*

PM processes:	Initiating, planning, executing, controlling, closing
PM objectives:	Scope, schedule, budget, quality
Tools:	Project management, information systems development
Infrastructure:	Organizational, project, technical
PMBOK areas:	Integration mgmt, scope mgmt, time mgmt, cost mgmt, quality mgmt, H.R. mgmt, communications mgmt, risk mgmt, procurement mgmt

**Figure 2.1** An Information Technology Project Methodology

Methodologies provide the project team with a game plan for implementing the project and product life cycles. The team can then focus on the tasks at hand, instead of always worrying about what they are supposed to do next. In addition, a methodology also provides a common language that allows the project team, project sponsor, and others within the organization to communicate more effectively. By standardizing a methodology throughout the organization, management can compare different projects more objectively because each project's planned and actual progress is reported the same way. Ideally, this will allow management to make better-informed and more objective decisions with respect to which projects get selected and whether funding should continue to support a particular project.

A good methodology should be flexible and adapt to the needs of the project organization over time. For example, whether a structured or rapid applications development (RAD) approach is used depends upon the project and application system. During the analysis and design phases of the systems development life cycle, a team may use one modeling approach or a combination (i.e., process modeling, data modeling, or object-oriented modeling).

The development and modeling approach used, however, depends on a number of factors. These factors may include the organization's experiences, the knowledge

## THE PROJECT MANAGEMENT OFFICE

In the past, many companies did not use a project management approach in the development of IT projects, and as a result, most IT projects were late and over budget. Companies these days are trying to establish a project management culture, and establishing a project office is one way of developing that culture while improving results and cutting cost. In fact, Forrester Research, Inc. in Cambridge, Massachusetts, has conducted a study of thirty companies that suggests the mission of project offices is "to bring order out of the chaos of project management." The study also suggests that the biggest challenges focus on managing multiple projects, cross-functional projects, global projects, overlapping projects, interdependent projects, project resource allocation, politics, sponsorship, and culture.

The role of a project office is to provide support and collect data while providing tools and methodologies. Collecting information about projects company-wide gives the project office a means to study the company's portfolio of IT projects. Eventually, this historical information can be used as a basis for estimating and conducting reality checks for projects. Many view these project offices as

centers of excellence for project management. Some benefits of a project office include:

- Pointing out minefields in project processes, such as estimating costs.
- Enforcing priorities and/or controls that keep the project on track.
- Coordinating cross-functional projects that may stumble as a result of politics that arise when intra-organizational boundaries are crossed.
- Providing a standardized way for all projects to be planned, managed, and reported.
- Showing the real value of projects by comparing projected costs and benefits with actual results.
- Coordinating more or larger projects than the organization could handle in the past.
- Allowing IT to support its requests for additional staff or resources.

SOURCE: Adapted from Kathleen Melymuka, "Here Comes the Project Office," *Computerworld*, August, 2, 1999, <http://www.computer-world.com/news/1999/story/0,11280,36545,00.html>.

and skill sets of the project team, the IT and organizational infrastructure to support the development effort and the application, and the nature of the project itself—that is, the project's size, degree of structure, development time frame, and role within the organization. Many IS development methodologies have been proposed, but most focus on *the product* of the development effort. As discussed in Chapter 1, whether or not an organization follows a formal IS development methodology, the development effort should fit within, or be part of, an overall project management methodology.

Although many IT projects fail or experience significant challenges, a methodology can incorporate the experiences of and lessons learned by the project team members. Developing and implementing an IT product then becomes more predictable and the likelihood of success increases. Over time, an organization's methodology incorporates a set of best practices that fits the organization and the projects it undertakes. These best practices should lead to fewer wasted resources and projects that provide true value to the organization. The organization will find more opportunities for competitive advantage as efficiency and effectiveness increase.

### Phase 1: Conceptualize and Initialize

The first stage of the IT project methodology focuses on defining the overall goal of the project. A project is undertaken for a specific purpose, and that purpose must be to add tangible value to the organization. Defining the project's goal is the most important step in the IT project methodology. As you will see, the project's goal aids in defining the project's scope and guides decisions throughout the project life cycle. It will also be used at the end of the project to evaluate the project's success.

Alternatives that would allow the organization to meet its goal must be identified. Then, the costs and benefits, as well as feasibility and risk, of each alternative must be analyzed. Based upon these analyses, a specific alternative is recommended for funding. Finally, the project's goal and the analysis of alternatives that support the goal are summarized in a deliverable called the business case. Senior management will use the business case during the selection process to determine whether the proposed project should be funded. The details of developing the project goal and business case will be discussed in more detail later in this chapter.

## Phase 2: Develop the Project Charter and Detailed Project Plan

The **project charter** is a key deliverable for the second phase of the IT project methodology. It defines how the project will be organized and how the project alternative that was recommended and approved for funding will be implemented. The project charter provides another opportunity to clarify the project's goal and defines the project's objectives in terms of scope, schedule, budget, and quality standards. In addition, the project charter identifies and gives authority to a project manager to begin carrying out the processes and tasks associated with the systems development life cycle (SDLC). The project plan provides all the tactical details concerning who will carry out the project work and when. The project charter and plan answer the following questions:

- Who is the project manager?
- Who is the project sponsor?
- Who is on the project team?
- What role does everyone associated with the project play?
- What is the scope of the project?
- How much will the project cost?
- How long will it take to complete the project?
- What resources and technology will be required?
- What approach, tools, and techniques will be used to develop the information system?
- What tasks or activities will be required to perform the project work?
- How long will these tasks or activities take?
- Who will be responsible for performing these tasks or activities?
- What will the organization receive for the time, money, and resources invested in this project?

In addition, the project's scope, schedule, budget, and quality objectives are defined in detail. Although some may wish to combine the business case with the project charter and plan, the IT project methodology presented in this text recommends that the business case and project charter/plan remain separate. There are a number of reasons to justify separation.

First, much time and effort must be devoted to understanding the "big picture." This process involves high-level strategic planning. Defining and agreeing to the project's goal and making a recommendation are not easy, nor is getting agreement on which projects should be funded. However, once the project's goal and recommended strategy are defined and agreed to, it will help define the details of the project, that is, who does what and when. The focus of the *conceptualize and initialize phase* is to determine whether a proposed project should and can be done.

The second reason is that the project charter and plan are the products of tactical planning. Here, the details will define how the project's goal will be achieved, by defining the approach and tasks to support the SDLC. Combining strategic planning with tactical planning can confuse the project's goal and objectives with how they should be achieved. It then becomes easy for people to fall into a trap where they worry too much about how they are going to get someplace when they have not even decided where they are going!

The third reason to separate the phases is time. It is better to pull the plug on a project with a high probability of failure or without the expected business value as early as possible. Why spend the time, money, and resources on developing a detailed plan for a project that should not be undertaken? Therefore, a project should be *doable* and *worth doing* before an organization spends resources determining *how* the project should be done. Reviews at the end of each phase provide the decision-making controls to ensure that resources are committed appropriately.

### Phase 3: Execute and Control the Project

The third phase of the IT project methodology focuses on execution and control—carrying out the project plan to deliver the IT product and managing the project's processes to achieve the project's goal. It is during this phase that the project team uses a particular approach and set of systems analysis and design tools for implementing the systems development life cycle (SDLC).

In addition, the project manager must ensure that the environment and infrastructure to support the project includes:

- Acquisition of people with the appropriate skills, experience, and knowledge
- The technical infrastructure for development
- IS development methods and tools
- A proper work environment
- Scope, schedule, budget, and quality controls
- A detailed risk plan
- A procurement plan for vendors and suppliers
- A quality management plan
- A change management plan
- A communications plan
- A testing plan
- An implementation plan
- A human resources system for evaluation and rewards

### Phase 4: Close Project

After the information system has been developed, tested, and installed, a formal acceptance should transfer control from the project team to the client or project sponsor. The project team should prepare a final project report and presentation to document and verify that all the project deliverables have been completed as defined in the project's scope. This gives the project sponsor confidence that the project has been completed and makes the formal approval and acceptance of the project go more smoothly.

At this time, the final cost of the project can be determined. Subsequently, the consultant may invoice the client for any remaining payments, or the accounting department may make any final internal charges to appropriate accounts. In addition,



the project manager and team must follow a set of processes to formally close the project. These processes include such things as closing all project accounts, archiving all project documents and files, and releasing project resources.

### Phase 5: Evaluate Project Success

The final phase of the methodology should focus on evaluating four areas. First, a postmortem, or final project review, should be conducted by the project manager and team. This review should focus on the entire project and attempt to assess what went well and what the project team could have done better. Subsequently, the lessons learned from the project team's experience should be documented and shared with others throughout the organization. In addition, the project manager and team should identify best practices that can be institutionalized throughout the organization by incorporating them into the methodology. As a result, the methodology evolves and better suits the organization's processes, culture, and people.

The second type of evaluation should take place between the project manager and the individual project team members. Although this performance review may be structured in terms of the organization's performance and merit review policies and procedures, it is important that each member of the team receive honest and useful feedback concerning his or her performance on the project. Areas of strength and opportunities for improvement should be identified so that plans of action can be developed to help each person develop to his or her potential.

In addition, an outside third party should review the project, the project manager, and project team. The focus of this review should be to answer the following questions:

- What is the likelihood of the project achieving its goal?
- Did the project meet its scope, schedule, budget, and quality objectives?
- Did the project team deliver everything that was promised to the sponsor or client?
- Is the project sponsor or client satisfied with the project work?
- Did the project manager and team follow the processes outlined in the project and system development methodologies?
- What risks or challenges did the project team face? And how well did they handle those risks and challenges?
- How well did the project sponsor, project team, and manager work together? If there were any conflicts, how well were they addressed and managed?
- Did the project manager and team act in a professional and ethical manner?

Lastly, the project must be evaluated in order to determine whether the project provided value to the organization. The goal of the project should be defined in the first phase of the project. In general, the value an IT project brings to the organization may not be clearly discernable immediately after the project is implemented. Therefore, it may be weeks or even months before that value is known. However, time and resources should be allocated for determining whether the project met its intended goal or not.

### IT Project Management Foundation

The box under the phases in Figure 2.1 defines the IT project management foundation. This includes the project management processes, objectives, tools, infrastructure, and knowledge areas that are needed to support the IT project.



*Project Management Processes* According to the Project Management Body of Knowledge (PMBOK), a **process** is a series of activities that produce a result. **Project management processes** describe and help organize the work to be accomplished by the project, while **product-oriented processes** focus on the creation and delivery of the product of the project. These management and product-oriented processes tend to overlap and are integrated throughout the project's life cycle. Each phase of the methodology should include the following:

- *Initiating processes*—to start or initiate a project or phase once commitment is obtained.
- *Planning processes*—to develop and maintain a workable plan to support the project's overall goal.
- *Executing processes*—to coordinate people and other resources to execute the plan.
- *Controlling processes*—to ensure proper control and reporting mechanisms are in place so that progress can be monitored, problems identified, and appropriate actions taken when necessary.
- *Closing processes*—to provide closure in terms of a formal acceptance that the project or a project's phase has been completed satisfactorily.

*Project Objectives* In addition to an overall goal, a project will have several objectives. These objectives support the overall goal and may be defined in terms of the project's scope, schedule, budget, and quality standards. Separately, each of these objectives cannot define success; however, together they must support the project's goal. This relationship is illustrated in Figure 2.2.

*Tools* Tools support both the processes and product of the project. These project management tools, include tools and techniques for estimation, as well as tools to develop and manage scope, schedule, budget, and quality. Similarly, tools support the development of the information system. For example, computer aided software engineering (CASE) tools and models support the analysis and design phases of development.

*Infrastructure* Three infrastructures are needed to support the IT project. These include:

- *An organizational infrastructure*—The organizational infrastructure determines how projects are supported and managed within the organization. The organizational infrastructure influences how project resources are allocated, the reporting relationships of the project manager and the project team members, and the role of the project within the organization.

- *A project infrastructure*—The project infrastructure supports the project team in terms of the project environment and the project team itself. It includes:

*The project environment*—The physical workspace for the team to meet and work.

*Roles and responsibilities of the team members*—This determines the reporting relationships, as well as the responsibilities and authorities of the individual team members.

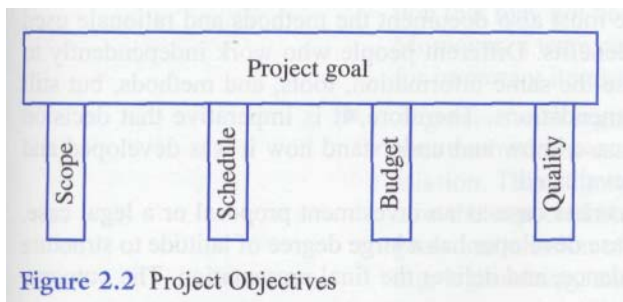


Figure 2.2 Project Objectives

*Processes and controls*—Processes and controls provide support for managing all aspects of the project. They ensure that the project's goal and objectives are being met.

- *A technical infrastructure*—The technical infrastructure provides the hardware and software tools to support the project team. It may include such things as project management software, e-mail, voice mail, word processing, access to the Internet, and so on. The technical infrastructure allows the project team to do its work.

*Project Management Knowledge Areas* The Project Management Body of Knowledge (PMBOK) encompasses nine areas generally accepted as having merit for effectively managing projects. These nine areas support both the project processes and product by providing a foundation of knowledge for supporting projects within a particular organization.

As an organization gains more experience with projects over time, the lessons learned from every project contribute to each of these nine areas. Ideally, these lessons will lead to an IT project management knowledge base that can be used to identify best practices that adapt the IT project methodology to an organization's needs, culture, and IT project environment. This base of knowledge can then be institutionalized throughout the organization and its projects.

## THE BUSINESS CASE

### What Is a Business Case?

Although organizations have increasingly turned to information technology to improve effectiveness and levels of efficiency, many projects have been undertaken without a thorough understanding of their full costs and risks. As a result, numerous IT projects have failed to return benefits that compensate adequately for the time and resources invested.

A business case provides the first deliverable in the IT project life cycle. It provides an analysis of the organizational value, feasibility, costs, benefits, and risks of several proposed alternatives or options. However, a business case is *not* a budget or the project plan. The purpose of a business case is to provide senior management with all the information needed to make an informed decision as to whether a specific project should be funded (Schmidt 1999).

For larger projects, a business case may be a large, formal document. Even for smaller projects, however, the process of thinking through why a particular project is being taken on and how it might bring value to an organization is still useful.

Because assumptions and new information are sometimes used to make subjective judgments, a business case must also document the methods and rationale used for quantifying the costs and benefits. Different people who work independently to develop a business case can use the same information, tools, and methods, but still come up with different recommendations. Therefore, it is imperative that decision makers who read the business case know and understand how it was developed and how various alternatives were evaluated.

One can also think of a business case as an investment proposal or a legal case. Like an attorney, the business case developer has a large degree of latitude to structure arguments, select or ignore evidence, and deliver the final presentation. The outcome

depends largely on the ability to use compelling facts and logic in order to influence an individual or group with decision-making authority. Thus, a good IT business case should be (1) thorough in detailing all possible impacts, costs, and benefits; (2) clear and logical in comparing the cost/benefit impact of each alternative; (3) objective through including all pertinent information; and (4) systematic in terms of summarizing the findings (Schmidt 1999).

## Developing the Business Case

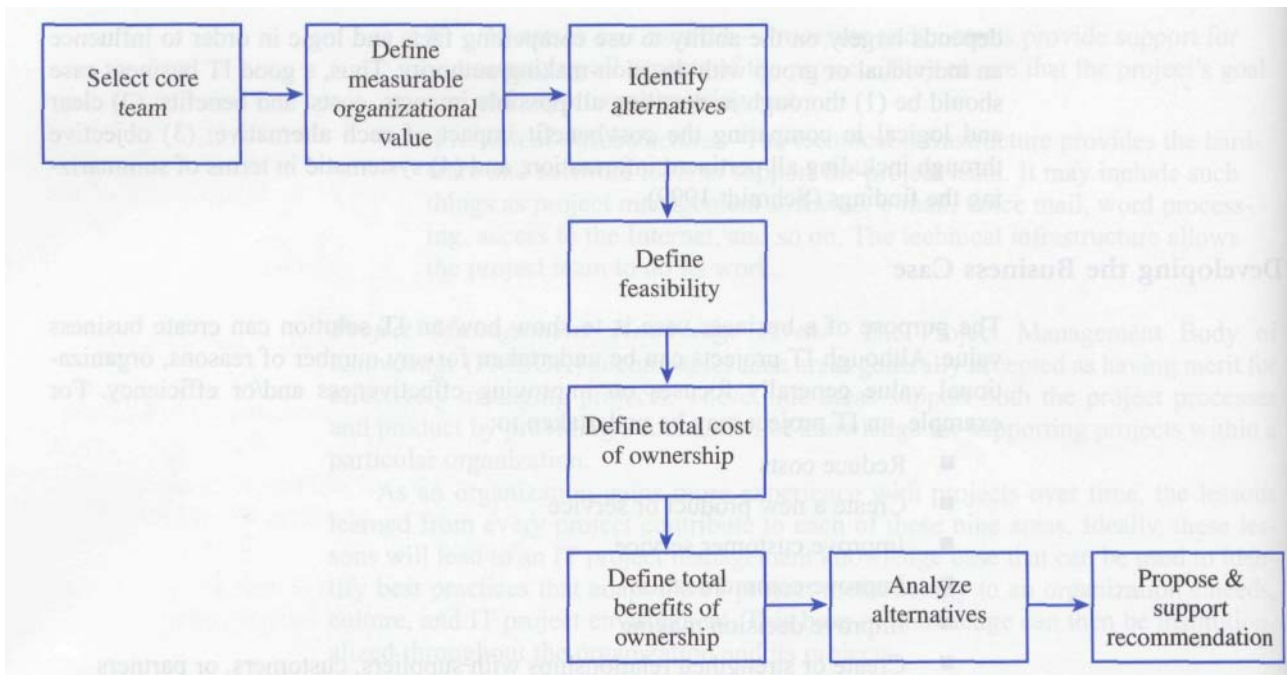
The purpose of a business case is to show how an IT solution can create business value. Although IT projects can be undertaken for any number of reasons, organizational value generally focuses on improving effectiveness and/or efficiency. For example, an IT project may be undertaken to:

- Reduce costs
- Create a new product or service
- Improve customer service
- Improve communication
- Improve decision making
- Create or strengthen relationships with suppliers, customers, or partners
- Improve processes
- Improve reporting capabilities
- Support new legal requirements

Although these are just some of the reasons for proposing an IT project, it is up to management to evaluate, select, and fund projects on the basis of the value they bring to the organization. Therefore, the business case must show explicitly how an investment in IT will lead to an increase in business value. Figure 2.3 depicts the process for developing a business case.

*Step 1: Select the Core Team* Rather than have one person take sole responsibility for developing the business case, a core team should be recruited. If possible, developing a business case should include many of the stakeholders affected by the project or involved in its delivery. The core team should, therefore, include managers, business specialists, and users who understand the requirements to be met, as well as IT specialists who understand the opportunities, limitations, and risks associated with IT. In general, there are several advantages for having a core team develop the business case (Schmidt 1999):

- *Credibility*—A team made up of individuals from various organizational areas or departments can provide access to critical expertise and information that may not be readily accessible to others outside that particular area. Moreover, a team can provide different points of view and provide a check for important items that an individual may overlook.
- *Alignment with organizational goals*—Higher-level managers can help connect the business case with the organization's long-term strategic plan and mission. This alignment may be beneficial in understanding and presenting how the expected business value of the IT project will support the overall goals and mission of the organization. Moreover, it may facilitate prioritizing, legitimizing, and assigning value of the IT project to the organization's



**Figure 2.3** The Process for Developing a Business Case

strategic business objectives. In other words, the business case should outline how the successful completion of the proposed project will help the organization achieve its overall mission, goals, and objectives.

- *Access to the real costs*—Core members with certain expertise or access to important information can help build more realistic estimates in areas such as salaries, overhead, accounting and reporting practices, training requirements, union rules and regulations, and hiring practices.

In addition, the core team that develops the business case can play a crucial role when dealing with various areas or departments within the organizational boundary. The advantages include:

- *Ownership*—A cross-functional team can spread a sense of ownership for the business case. A project that includes other areas from the outset has a better chance of reducing the political problems associated with territorial domains.
- *Agreement*—If you develop a business case in isolation, it is very likely that you will have to defend your assumptions and subjective judgments in a competitive or political setting. However, if a core team develops the business case, the critics may be more apt to argue the results rather than the data and methods used.
- *Bridge building*—The core team may serve as an effective tool for handling critics of the business case. One tactic may be to include critics on the core team or to at least allow recognition and consideration for their positions. This may lead to fewer surprises and attacks later on.

*Step 2. Define Measurable Organizational Value (MOV)* The core team's objective should be to define the problem or opportunity and then identify several alternatives

that will provide direct and measurable value to the organization. To provide real value to an organization, however, IT projects must align with and support the organization's goals, mission, and objectives. Therefore, any recommended alternative by the core team must have a clearly defined purpose and must map to the goals and strategy of the organization. The goal of the project then becomes the project's measure of success (Billows 1996; Smith 1999). In the IT project management methodology, the project's overall goal and measure of success is referred to as the project's **measurable organizational value (MOV)**. As the name implies, the MOV must:

- *Be measurable*—Measurement provides focus for the project team in terms of its actions. Instead of implementing an information system, the project team attempts to achieve a specific performance target. Moreover, an MOV provides a basis for making decisions that affect the project through its remaining phases. Why do additional work or make decisions that affect the project if they do not help you achieve the MOV?
- *Provide value to the organization*—Resources and time should not be devoted to a project unless they provide some kind of value to the organization. Keep in mind that information technology in itself cannot provide value. Technology is only an enabler—that is, IT enables organizations to do things.
- *Be agreed upon*—A clear and agreed upon MOV sets expectations for the project stakeholders. It is important that all project stakeholders understand and agree to the project's MOV. It is not easy to get everyone to agree to the project's goal so early; but it will be well worth the time and effort in the later stages of the project (Billows 1996).
- *Verifiable*—At the end of the project, the MOV must be verified to determine if the project was a success.

The MOV guides all the decisions and processes for managing the IT project and serves as a basis for evaluating the project's achievements. In other words, a project cannot be properly planned or evaluated unless the goal of the project is clearly defined and understood. An organization should not undertake projects that are not clearly linked to its overall mission.

The IT value chain depicted in Figure 2.4 suggests that an organizational goal leads to or defines an organizational strategy. In turn, a project's measurable organizational value then supports this organizational strategy. This mapping shows how a project's goal aligns with an organization's strategy and goal. At the end of the project, the project's actual achievements can be compared to its initial MOV to determine whether the project was successful. If the project is a success (i.e., it either met or exceeded its MOV), then one can see explicitly how that project will support the organization.

For example, if we follow Michael Porter's (Porter 1980; Porter 1985) competitive forces model, one organizational goal may be to prevent customers from leaving or switching to a competitor. Therefore, an organizational strategy to support this goal may be to develop tight linkages with customers. To support this organizational

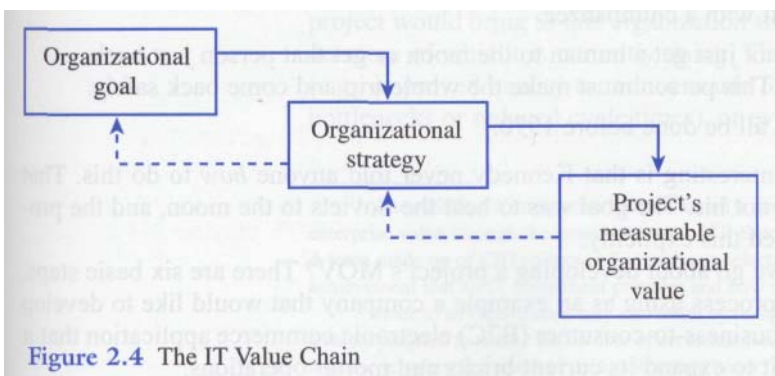


Figure 2.4 The IT Value Chain

strategy and goal, the organization may consider developing a business-to-business (B2B) application that will allow customers to check inventory status, place orders, track shipments, receive an invoice, pay an invoice, and receive various reports online.

Will the installation of hardware and a network mean that the B2B application was a success? Will the development and implementation of the application software? What if the project is completed not only on time, but also within budget? A yes answer here is only partially correct. Although all of these achievements are important, they cannot be true measures of a project's success.

More specifically, installing hardware and a network are activities. Having them in place is a necessary, but not sufficient, condition for success. In other words, hardware and software can be in place, but unless they support the organizational goal and strategy, their mere installation does not bring much value to the organization. One can also view budget and schedule in the same light. You can have a project that is finished on time and within budget, but unless it brings value to the organization in terms of supporting a goal and strategy, it will not be of much use.

But what if a project goes over schedule and over budget? How will that impact the project's value to the organization? The answer is that it depends. A project that is late and over budget certainly can impact the project's value to the organization, but success or failure really depends on the amount of value a project will provide. For example, should a project that is one day late and a dollar over budget be considered unsuccessful? Probably not. What about a project that is one week late and \$ 1,000 over budget? That depends on how these overruns compare to the original schedule and budget. If the original schedule and budget were two years and \$ 1 million, then most people would agree that the schedule and cost variation is no big deal.

What's more important is the value the project brings to the organization. A consultant friend once told a story of a CEO who was ecstatic because an e-commerce project the company was taking on was only one year late and only \$12 million over budget. In this case, schedule and cost did not matter all that much because once the e-commerce site was up and running the company would make the deficit up within six months. The moral of the story is that business value is the most important criteria for IT projects.

A project's MOV should be based on the organization's goal and strategy. An excellent example of an MOV is the following statement that John F. Kennedy made back in the 1960s, "Our goal is to land a man on the moon and return him safely by the end of the decade."

This simple yet powerful statement mobilized an entire nation and fueled the space race with the then Soviet Union. What is interesting about this statement is how clear and measurable the goal becomes:

- A human being is to land on the moon—not an unmanned spacecraft or a spacecraft with a chimpanzee.
- We will not just get a human to the moon or get that person just back halfway. This person must make the whole trip and come back safely.
- This will all be done before 1970.

What is equally interesting is that Kennedy never told anyone *how* to do this. That was NASA's job, not his. The goal was to beat the Soviets to the moon, and the project's MOV defined this explicitly.

But how do we go about developing a project's MOV? There are six basic steps. Let's follow that process using as an example a company that would like to develop and implement a business-to-consumer (B2C) electronic commerce application that it hopes will allow it to expand its current bricks and mortar operations.

*Identify the Desired Area of Impact* The first step involves identifying the desired impact the IT project will play in supporting the organization. One approach might be to adapt the criteria used by *CIO* magazine's Enterprise Value Awards.<sup>1</sup> The guidelines summarized in Table 2.1 are used by the judges to define IT value and provide a good starting point for developing the MOV and business case. You should feel free to adapt these areas of impact as needed. The important question to answer at this point is why are we thinking of doing this project?

In our B2C example, the project manager would meet with the project sponsor and first determine how the idea for the project came about. Although the reasons could be broad and numerous (i.e., all of our competitors are doing it, it is part of our long-term strategy, we think we can make a lot of money, B2C will make our company look hip), identifying them will provide a background for understanding how and why decisions are made by the sponsor's organization. In this example, we will say that the reasons for considering this project are both strategic and financial because the company wants to expand its current brick and mortar operations. The idea is not to neatly categorize the project, but to understand the nature of the project and how it will impact the organization.

*Identify the Desired Value of the IT Project* Once the desired area of impact is identified, the next step involves determining the desired value the IT project will bring to the organization. This area is can be tricky, but having a process helps. In simplest terms, we can identify the value of an IT project by providing answers to the following four questions:

- *Better*—What does the organization want to do better? (For example, improve quality or increase effectiveness?)
- *Faster*—What does the organization want to do faster? (Increase speed, increase efficiency, or reduce cycle times?)
- *Cheaper*—What does the organization want to do cheaper? (Reduce costs?)
- *Do more*—What does the organization want to do more than it is currently? (Growth or expansion?<sup>2</sup>)

The key words to identifying the value an IT project will provide an organization are *better*, *faster*, *cheaper*, and *do more*. The first three criteria—better, faster, and cheaper—focus on quality, effectiveness, and efficiency, while doing more of something focuses on growth. For example, if an organization has identified increasing profits as its desired area of impact, it makes sense that it would like to make more money than it currently does. Therefore, value to this organization would be in the form of growth. On the other hand, another organization may be faced with high inventory costs as a result of having too much inventory in its warehouse. The value that an IT project would bring to this organization would not be from growth; it does not want to do more of what it is currently doing. The value comes from doing something better (e.g., improved quality to reduce waste or rework), faster (e.g., fewer manufacturing bottlenecks or reduced cycle times), or even cheaper (e.g., lower overhead costs).

<sup>1</sup> Since 1993, *CIO* magazine has conducted a competition to identify and honor organizations that create enterprise value through the innovative use of IT. Entrants must submit an entry following contest guidelines. A team made up of *CIO* editors and consultants selects finalists. Entries are judged on the value of the achievement that an IT investment provides and how it serves the organizations mission.

<sup>2</sup> Value to an organization may also result by doing *less* of something. For example, a company may develop a safety program to reduce the number of accidents. Reducing accidents can be viewed as negative growth or as an increase in safety as a result of doing something better (i.e., quality). It just depends on one's viewpoint.

**Table 2.1** Potential Areas of Impact for IT Projects

<i>Potential Area</i>	<i>Examples of Desired Impact</i>
Strategic	<ul style="list-style-type: none"> <li>■ Penetration of new markets</li> <li>■ Transformation of the terms of competition within the market</li> <li>■ Increased market share</li> </ul>
Customer	<ul style="list-style-type: none"> <li>■ Customers have more choices of products or services</li> <li>■ Customers receive better products or services</li> <li>■ Transaction processes are more efficient or effective</li> </ul>
Financial	<ul style="list-style-type: none"> <li>■ Increased profit</li> <li>■ Increased margins</li> </ul>
Operational	<ul style="list-style-type: none"> <li>■ Lower costs due to streamlined operations</li> <li>■ Increased operational effectiveness</li> <li>■ Improvements to supply chain</li> </ul>
Social	<ul style="list-style-type: none"> <li>■ Education</li> <li>■ Health</li> <li>■ Safety</li> <li>■ Environment</li> </ul>

SOURCE: Adapted from *CIO* magazine's Enterprise Value Awards Application Form and Elaine M. Cummings, "Judgment Call," *CIO*, February 2, 2000, <http://www.cio.com/awards/eva/index.html>.

While the question in the first step focuses on why an organization wants to take on the project, this second step focuses on the question "how will this project help us achieve what we want to achieve?" At this point, the project manager and client should identify one or two value areas to emphasize. If all four of the value areas appear important, it is a good idea to rank them in order of importance. Keep in mind, however, that not having a clear idea of the desired impact or value of the project may well mean that the problem or opportunity is not clearly understood. The project team may end up treating the symptoms rather than the real problem.

Following our example of the B2C project, the value critical to the organization may be doing more through the project's ability to enable to organization to expand its current operations. Value from improved customer service and improved operations could also support the organization in doing things better, faster, and cheaper as well. This step

provides an excellent vehicle for all project stakeholders to discuss and identify the expected value of the project.

*Develop an Appropriate Metric* Once there is agreement as to the value the IT project will bring to the organization, the next step is to develop a metric or set of metrics that (1) provides the project team with a target or directive, (2) sets expectations among all stakeholders, and (3) provides a means for evaluating whether the project is a success later on. In general, tangible benefits to the organization are easier to define than intangible ones; however, this can be done with some creativity. For example, knowing whether profits increased should be fairly straightforward, but customer satisfaction may require surveys or interviews. Often evaluation requires benchmarking so that a before and after comparison can be made.

To develop a metric, the project manager and sponsor should agree on a specific number or range of numbers. When not obvious, the target metric should indicate whether an increase or decrease from the organization's current state is desired. The metrics may be expressed as dollars, percentages, or numbers. For example, an organization that wishes to increase profits may state this as a 20 percent increase or an increase of \$ 1 million from the last month, quarter, or fiscal year. On the other hand, an organization that would like to grow its customer base may set a goal of one hundred new customers. Therefore, the metrics to support an MOV may be one or a combination of the following:

- Money (in dollars, euros, etc.) (increase or decrease)
- Percentage (%) Numeric Value (increase or decrease)
- (increase or decrease)



The company in our example would like to grow strategically, that is, expand its current base of operations. There are a number of relevant metrics that could be used. The question is how will this company determine whether this project is a success. Keep in mind that the organization will make a significant investment by the time the project is completed. Will the B2C application be successful when the Web site is finished and anyone with an Internet connection can view the site? It is important to have a working Web site, but that alone will not make up for the investment and subsequent maintenance and support for keeping the site up and running. What about using a hit counter so that the organization can tell how many times the B2C site was visited? Having traffic to the Web site is also important, but people who just visit will not keep the company in business nor will visitors justify the investment and cost of keeping the B2C Web site up and running.

It should now be obvious that the company must make money from its B2C Web site. Only a profit can justify the time, effort, and resources needed to develop and support the application. The questions then become how much profit and are there any other metrics that should be considered. Assume that management has determined that a 20 percent return will be adequate for covering all expenses and for providing the desired return. Also assume that management is interested in developing new customers. Therefore, the company has set a target of five hundred new customers. Why a 20 percent return and five hundred new customers? Those numbers are not developed by the project manager or project team on their own. The 20 percent return and five hundred new customers' metrics can only be determined by the project sponsor. The project manager and project team only guide the process.

*Set a Time Frame for Achieving the MOV* Once you have agreement on the target metrics that will provide the desired impact to the organization, the next step is to agree on a specific time frame. For example, a company may focus on increasing profits or reducing costs, but the question is when will these results be achieved. Keep in mind that the scheduled completion of the project is not the same thing as the agreed upon time frame for achieving the MOV. Scope, schedule, budget, and quality are project objectives. The MOV is the project goal. Rarely will the installation of an information system provide the desired or expected value right away. A project with an immovable deadline may, however, have a specific date as part of the MOV. For example, there may be cause for putting a deadline date in the MOV in 01/01/10000, when all the dates in computers, or whatever they are using then, have to be changed once more.

The project manager and sponsor should also agree upon how and when the project's MOV will be evaluated. Continuing with the example, let's say that management would like to see a 20 percent return and five hundred new customers within one year after the system goes online. But what happens after the first year? Perhaps the company would like to maintain this growth annually over the useful life of the system. There is, however, no reason why different targets cannot be set for different time periods. For example, a 20 percent return and five hundred new customers may be sufficient for the first year, but these targets may change as word spreads and more and more people know about the B2C Web site. Therefore, the company may establish a target of a 25 percent return and one thousand new customers in the second year, while a 30 percent return with 1,500 new customers is set for the third year. The MOV should be flexible to accommodate the expectations and needs of the project sponsor.

*Verify and Get Agreement from the Project Stakeholders* The next step in developing the MOV is to ensure that it is accurate and realistic. In short, will the successful completion of this project provide the intended value to the organization? And is the MOV realistic? The development of the MOV requires a close working rela-

relationship between the project manager and the sponsor. The project manager's responsibility is to guide the process, while the sponsor must identify the value and target metrics. This joint responsibility may not always be easy, especially when several sponsors or individuals need to agree upon what will make an IT project successful or what exactly will bring value to the organization. Still, it is better to spend the time arguing and getting consensus now rather than during later phases of the project. While the project manager is responsible for guiding the process, he or she needs to be confident that the MOV can be achieved. Being challenged is one thing; agreeing to an unrealistic MOV is another. The latter can be detrimental to your career, the project team, and everyone's morale.

*Summarize the MOV in a Clear, Concise Statement or Table* Once the impact and value to the organization are verified and agreed upon by all the project stakeholders, the MOV should be summarized in a single statement or table. Summarizing the MOV (1) provides an important chance to get final agreement and verification, (2) provides a simple and clear directive for the project team, and (3) sets explicit expectations for all project stakeholders. The easiest way to summarize the MOV in a statement form is to complete the following statement:

This project will be successful if \_\_\_\_\_.

For example, using a single statement format, the MOV would be:

MOV: The B2C project will provide a 20 percent return on investment and five hundred new customers within the first year of its operation.

However, if the MOV includes a growth component, a table format may be clearer. For example, the project's MOV over three years could be summarized as shown in Table 2.2. Notice that the MOV does not include any explicit statements about technology. More specifically, it does not mention that a particular relational database vendor's product will be used or that the system will be programmed in a particular language. It is up to the project team to figure out how to build the system and determine what technology will be employed to achieve the project goal. At this point in the project, we are concerned with the organization—not with the technology!

The project team's directive will be to achieve the MOV, not just develop and implement a B2C Web site. Although information technology will play an important role, the designers and developers of the information system cannot be expected to know everything or be solely responsible for achieving the project goal.

In the past, purely technical approaches were often applied to organizational problems. A system would be built, but did it really support or have a significant, positive impact on the organization? Judging from the *Chaos* study, most IT projects have not lived up to management's expectations. In short, the technical people may understand and be very

good at working with the technology, but achieving this MOV will also require an organizational approach and commitment. A cross-functional project team that includes a number of non-technical experts will be required so that the burden of achieving this MOV does not rest squarely on the shoulders of the technical experts. Therefore, the selection of the project team becomes a crucial project management decision.

**Table 2.2** Sample MOV Using Table Format

Year	MOV
1	20% return on investment 500 new customers
2	25% return on investment 1,000 new customers
3	30% return on investment 1,500 new customers

*Step 3: Identify Alternatives* Since no single solution generally exists for most organizational problems, it is imperative to identify several alternatives before dealing directly with a given business opportunity. The alternatives, or options, identified in the business case should be strategies for achieving the MOV.

It is also important that the alternatives listed include a wide range of potential solutions as well as a **base case alternative** that describes how the organization would perform if it maintained the status quo—i.e., if it did not pursue any of the options described in the business case. In some situations, maintaining the status quo may be the best alternative. It is important to be open to and objective on all viable options.

The base case should also delve into the realistic costs of maintaining the current system over time. Include such things as increased maintenance costs of hardware and software, as well as the possibility for more frequent system failures and downtime. However, if the demand for service decreases, maintaining a legacy system may be a more viable alternative than a proposed new system.

On the other hand, other options may provide the best solution. These options should consider a spectrum of choices that include:

- Changing the existing business processes without investing in IT
- Adopting or adapting an application developed by a different area or department within the organization
- Reengineering the existing system
- Purchasing an off-the-shelf application package from a software vendor
- Custom building a new application using internal resources or outsourcing the development to another company

*Step 4: Define Feasibility and Assess Risk* Each option or alternative must be analyzed in terms of its feasibility and potential risk. **Feasibility** should focus on whether a particular alternative is *doable* and *worth doing*. **Risk**, on the other hand, focuses on *what can go wrong* and *what must go right*. Analyzing the feasibility and risk of each alternative at this point may act as a screening process for ruling out any alternatives that are not worth pursuing. Feasibility may be viewed in terms of:

- *Economic feasibility*—Although a cost/benefit analysis will be conducted to look at the alternatives in greater depth, some alternatives may be too costly or simply not provide the benefits envisioned in the problem statement. At this point, an organization may evaluate an alternative in terms of whether funds and resources exist to support the project. For example, although you may be in a market for a new car, the reality of your limited income rules out the fancy sports car. Conducting an economic feasibility should serve as a reality check for each option or alternative.
- *Technical feasibility*—Technical feasibility focuses on the existing technical infrastructure needed to support the IT solution. Will the current infrastructure support the alternative? Will new technology be needed? Will it be available? Does the current IT staff have the skills and experience to support the proposed solution? If outsourcing, does the vendor or company have the skills and experience to develop and implement the application?
- *Organizational feasibility*—Organizational feasibility considers the impact on the organization. It focuses mainly on how people within the organization will adapt to this planned organizational change. How will people and the way they do their jobs be impacted? Will they accept this change willingly? Will business be disrupted while the proposed solution is implemented?
- *Other feasibilities*—Depending on the situation and the organization, a business case may include other issues, such as legal and ethical feasibility.

Risk should focus on:

- *Identification*—What can go wrong? What must go right?
- *Assessment*—What is the impact of each risk?
- *Response*—How can the organization avoid or minimize the risk?

*Step 5: Define Total Cost of Ownership* The decision to invest in an IT project must take into account all of the costs associated with the application system. **Total Cost of Ownership (TCO)** is a concept that has gained widespread attention in recent years and generally refers to the total cost of acquiring, developing, maintaining, and supporting the application system over its useful life. TCO includes such costs as:

- *Direct or up-front costs*—Initial purchase price of all hardware, software, and telecommunications equipment, all development or installation costs, outside consultant fees, etc.
- *Ongoing costs*—Salaries, training, upgrades, supplies, maintenance, etc.
- *Indirect costs*—Initial loss of productivity, time lost by users when the system is down, the cost of auditing equipment (i.e., finding out who has what and where), quality assurance, and post implementation reviews.

It is important to note that TCO goes beyond the original purchase or development costs. In fact, the TCO is really an organized list of all possible cost impacts. When preparing the business case, it is also important to document all data sources, assumptions, and methods for determining the various costs.

*Step 6: Define Total Benefits of Ownership* Similarly, the **Total Benefits of Ownership (TBO)** must include all of the direct, on-going, and indirect benefits associated with each proposed alternative. The TBO should address the benefits of an alternative over the course of its useful life. Benefits can arise from:

- *Increasing high-value work*—For example, a salesperson may spend less time on paperwork and more time calling on customers.
- *Improving accuracy and efficiency*—For example, reducing errors, duplication, or the number of steps in a process.
- *Improving decision-making*—For example, providing timely and accurate information.
- *Improving customer service*—For example, new products or services, faster or more reliable service, convenience, etc.

Tangible benefits associated with an IT project are relatively easy to identify and quantify. They will usually arise from direct cost savings or avoided costs. On the other hand, intangible benefits may be easy to identify, but they are certainly more difficult to quantify. It is important to try and quantify all of the benefits identified. One way to quantify intangible benefits is to link them directly to tangible benefits that can be linked to efficiency gains. For example, a corporate telephone directory on an intranet not only improves communication, but also can cut paper, printing, and labor costs associated with creating and distributing a paper-based telephone book.

Another way to quantify intangible benefits is to estimate the level of service. For example, one could determine how much someone is willing to pay for a particular service or compare prices of products or services that have or do not have a particular feature. Moreover, if an electronic data interchange (EDI) application allows a

company to collect its accounts receivable more quickly, it can estimate the value of this benefit by determining the return it could earn by investing that money.

*Step 7: Analyze Alternatives* Once costs and benefits have been identified, it is important that all alternatives be compared with each other consistently. Understanding the financial and numeric tools and techniques required by financial people and senior management is critical, even for the technically savvy. Being able to communicate effectively using their terms and tools increases one's credibility and the chances of getting projects approved and funded. There are several ways to analyze the proposed alternatives. The most common are financial models and scoring models.

**Financial models** focus on either profitability and/or cash flows. Cash flow models focus on the net cash, may be positive or negative, and are calculated by subtracting the cash outflows from the cash inflows. In general, one could view the benefits associated with a particular alternative as a source of cash inflow and the costs as the source of outflows. Using a tool such as an electronic spreadsheet application, one could conduct a sensitivity analysis to view how changes in the initial investment or net cash flows would impact the risk of a particular project alternative.

The most commonly used cash flow models include payback, breakeven, return on investment, net present value, and scoring.

*Payback* The payback method determines how long it will take to recover the initial investment. For example, if a company spends \$100,000 developing and implementing an application system and then receives a net cash return of \$20,000 a year, the payback period for that investment would be:

$$\begin{aligned} \text{Payback Period} &= \frac{\text{Initial Investment}}{\text{Net Cash Flow}} \\ &= \frac{\$100,000}{\$20,000} \\ &= 5 \text{ years} \end{aligned}$$

Although the payback period is fairly straightforward to calculate and understand, it does not consider the time value of money or cash flows beyond the payback period. Still, the payback period is useful for highlighting the risk of a particular investment because a riskier investment will have a longer payback period than a less risky investment. Depending on the situation and the organization's policy, net cash flow may be either before tax or after tax.

*Breakeven* Similar to the payback method, the breakeven method attempts to determine the point at which a project would begin to recoup its original investment. This method is useful if a certain number of transactions allow the original investment to be recovered. For example, let's say that you would like to create a Web site to sell golf putters that you manufacture. If you spent \$100,000 to create the site, how many golf putters would you have to sell to break even if you sell each putter for \$30? To determine this point, you have to look at the cost of selling a putter. These costs may include the following:

Materials (putter head, shaft, grip, etc.)	\$12.00
Labor (0.5 hours at \$9.00/hr)	\$ 4.50
Overhead (rent, insurance, utilities, taxes, etc.)	\$ 8.50
Total	\$25.00

If you sell a golf putter for \$30 and it costs \$25 to make it, you have a profit margin of \$5. The breakeven point is computed as follows:

$$\begin{aligned}\text{Breakeven Point} &= \frac{\text{Initial Investment}}{\text{Net Profit Margin}} \\ &= \frac{\$100,000}{\$5} \\ &= 20,000\end{aligned}$$

Therefore, you would have to sell 20,000 putters over your Web site to break even.

Like the payback period method, the breakeven method is generally easy to compute and can provide a measure of risk. In general, riskier project alternatives will have a higher breakeven point than less risky project alternatives.

**Return on Investment** In a strict financial sense, **return on investment (ROI)** is an indicator of a company's financial performance. From a project management point of view, ROI provides a measure of the value expected or received from a particular alternative or project. It is calculated by dividing the net income, or return, of a project alternative by its total cost. So, if a project alternative, for example, is expected to cost \$100,000 but provide \$115,000 in expected benefits, its ROI would be:

$$\begin{aligned}\text{Project ROI} &= \frac{\text{total expected benefits} - \text{total expected costs}}{\text{total expected costs}} \\ &= \frac{\$115,000 - \$100,000}{\$100,000} \\ &= 15\%\end{aligned}$$

The above formula shows the expected ROI for a project alternative; a completed project's ROI would use the actual costs and benefits derived and can be compared to its expected ROI to provide a comparison at the end of the project. The usefulness of a project's ROI depends on two important assumptions. First, there must be the ability to define accurately the total costs and benefits expected or realized. Second, the returns must arise as a direct result of the initial investment. For example, if you purchased a lottery ticket for \$1 and won \$1 million, you can determine the ROI directly because the \$1 million return can be related to the \$1 lottery ticket you purchased. Even though the chances of winning a lottery are pretty slim, the ROI calculated as  $(\$1,000,000 - \$1) \div \$1 = 99,999,900$  percent would be quite acceptable for most people. In complex business situations, however, ROI analysis may be difficult because intervening variables and conditions may have an indirect influence.

Regardless, with ROI one can see the relationship between a project's costs and benefits. A project's ROI will increase as the benefits increase and/or the expected costs decrease. When comparing two or more projects or alternatives, those with the higher ROI would be the most desirable (all other things being equal). Many organizations even have a required ROI, whereby no project or alternative may be considered unless a certain ROI value can be achieved. The idea is that it is not worth investing time and resources in a project that does not provide a certain level of value to the organization and its shareholders.

**Net Present Value** **Net Present Value (NPV)** focuses on the time value of money. For example, if you borrow \$20 today, you may have to agree to pay back

the original \$20 plus another \$2 at the end of the month. Someone may also be willing to give you either \$18 today or \$20 at the end of the month. If you could take the \$18 and invest it, ending up with \$20 at the end of the month, you might feel indifferent as to whether you collected \$18 today or \$20 at the end of the month. The point here is that there is a cost associated with time when it comes to money.

It is going to take time and resources (i.e., costs) before any particular project or alternative is completed and provides the returns we originally envisioned. NPV takes this into account by discounting streams of cash flows a particular alternative or project returns in the future so that we can determine if investing the time, money, and resources is worth the wait. Very simply put, only a project or alternative with a positive NPV should be considered. Let's say that one alternative is an application system that is expected to cost \$200,000 and will be completed in the current year (Year 0). In addition, over the following four years the project's benefits will provide inflows of cash, while the costs to build, maintain and support this application will require outflows of cash. The expected cash flows for the next five years may look something like:

	Year 0	Year 1	Year 2	Year 3	Year 4
Total Cash Inflows	\$0	\$150,000	\$200,000	\$250,000	\$300,000
Total Cash Outflows	\$200,000	\$85,000	\$125,000	\$150,000	\$200,000
Net Cash Flow	(\$200,000)	\$65,000	\$75,000	\$100,000	\$100,000

To discount the net cash flows, a **discount rate** is required. This rate is sometimes called a **cutoff rate** or **hurdle rate** because it basically defines the organization's required rate of return. In short, the discount rate is the minimum return a company would expect from a project if the company were to make an equivalent investment in an opportunity of similar risk. This discount rate is usually set by management. The NPV is calculated using the formula:

$$NPV = -I_0 + \sum \left( \frac{\text{Net Cash Flow}}{(1+r)^t} \right)$$

Where:

$I$  = total cost (or investment) in the project

$r$  = discount rate

$t$  = time period

Therefore, if we use a discount rate of 8 percent, we can discount the net cash flow for each period and add them up to determine the NPV.

Time Period	Calculation	Discounted Cash Flow
Year 0	(\$200,000)	(\$200,000)
Year 1	$\$65,000 \div (1 + .08)^1$	\$60,185
Year 2	$\$75,000 \div (1 + .08)^2$	\$64,300
Year 3	$\$100,000 \div (1 + .08)^3$	\$79,383
Year 4	$\$100,000 \div (1 + .08)^4$	\$73,503
Net Present Value (NPV)		\$77,371

This alternative would be acceptable because a NPV of \$77,371 is positive. One can compare the NPV for different alternatives and projects. In general, the project or

alternative with a higher NPV would be more desirable. Remember, increasing the discount rate will decrease the NPV.<sup>1</sup>

**Scoring models** provide a method for comparing alternatives or projects based on a weighted score. Scoring models also allow for quantifying intangible benefits or for different alternatives using multiple criteria. Using percentage weights, one can assign values of importance to the different criteria. The weights must sum to 100 percent, and when multiplied by a score assigned to each criterion they allow a composite score that is the weighted average. For example, one could compare several alternatives using the following formula:

$$\text{Total Score} = \sum_{i=1}^n w_i c_i$$

Where:

$w_i$  = criterion weight

$c_i$  = criterion score

$0 \leq w_i \leq 1$

Table 2.3 compares three project alternatives using this system. The scoring model in Table 2.3 highlights several important ideas:

- *The scoring model can combine both qualitative and non-qualitative items.* Whether one assigns more weight to intangible or intangible criteria depends on the philosophy of management or the client.
- *Weights and scores can be largely subjective.* This scoring is a two-edged sword. People use their judgment, or gut feelings, in assigning weights and scores, but may not necessarily have the same judgments. Thus, getting agreement among individuals may be difficult. One suggestion is to have different individuals assign weights and scores to the different criteria and then average these individual responses to create a composite score. Even if people don't agree, at least they have an opportunity to express their opinions. Another suggestion would be to use a relative score whenever possible. For example, let's say that the NPVs for the three alternatives were as follows:

	Alternative		
	A	B	C
NPV	\$200	\$400	\$1,000

Since Alternative C has the highest NPV, we can determine a relative score (on a basis of 0 to 10) for each alternative as follows:

Alternative	NPV	Calculation	Relative Score
A	\$1,000	$(\$1,000 \div \$1,000) \times 10$	10
B	\$400	$(\$400 \div \$1,000) \times 10$	4
C	\$200	$(\$20 \div \$1,000) \times 10$	2

<sup>1</sup> Closely related to the concept of Net Present Value is the popular concept called Internal Rate of Return (IRR). The IRR focuses on streams of cash flows and is the discount rate where the total present value of future cash flows equals the cost of the investment. In short, it is the rate where the NPV is equal to zero. Therefore, alternatives or projects with higher IRR are more desirable. Management may set a minimum desired IRR that an alternative or project must meet in order to be considered. IRR can be readily computed with a financial calculator or by using specific spreadsheet or program functions; otherwise, the exact IRR must be interpolated.



Table 2.3 Comparison of Project Alternatives

Criterion		Weight	Alternative A	Alternative B	Alternative C
Financial	ROI	15%	2	4	10
	Payback	10%	3	5	10
	NPV	15%	2	4	10
Organizational	Alignment with strategic objectives	10%	3	5	8
	Likelihood of achieving project's MOV	10%	2	6	9
Project	Availability of skilled team members	5%	5	5	4
	Maintainability	5%	4	6	7
	Time to develop	5%	5	7	6
	Risk	5%	3	5	5
External	Customer satisfaction	10%	2	4	9
	Increased market share	10%	2	5	8
<b>Total Score</b>		<b>100%</b>	<b>2.65</b>	<b>4.85</b>	<b>8.50</b>

Note: Risk scores have a reverse scale—i.e., higher scores for risk imply lower levels of risk.

The scores used in this example range from 0 to 10; but there is nothing sacred about this range. One could use a scale of 0 to 100. Consistency rather than any particular scale is the key.

- *Financial models can be biased towards the short run.* Although financial models are important and should be considered, they focus solely on the periods used in discounting cash flows. Scoring models go beyond this limitation because they allow for multi-criteria (Meredith and Mantel 2000).
- *Some criteria can be reversed-scored.* In our example, higher scores for certain criteria make sense. For instance, higher financial performance measures inherently have higher scores. However, a criterion such as risk can be reversed-scored with lower risk alternatives having higher scores. If you reverse-score any criterion, it is beneficial to note these assumptions conspicuously for the reader.
- *Past experience may help create a more realistic business case.* As mentioned before, many of the weights and scores are subjective. Instead of relying on guesswork, past experience with past projects can provide guidelines and a reference for ensuring that the selection models are relevant and realistic. Although the business situation, technology, and data will change over time, the process or method of preparing a business case and analyzing alternatives will remain much the same. Learning from past experience can improve the process and product associated with business cases and thus improves the likelihood of a project being approved and funded.

*Step 8: Propose and Support the Recommendation* Once the alternatives have been identified and analyzed, the last step is to recommend one of the options. It is important to remember that a proposed recommendation must be supported. If the analysis was done diligently, this recommendation should be a relatively easy task.

The business case should be formalized in a professional-looking report. Remember that the quality and accuracy of your work will be a reflection on you and your organization. A potential client or project sponsor may not give you a second chance. Figure 2.5 provides a template for developing a business case.

## PROJECT SELECTION AND APPROVAL

The objective of the business case is to obtain approval and funding for a proposed alternative. However, a proposed project may have to compete against several others.

The criteria for selecting a **project portfolio**, a set of projects that an organization may fund, are very similar to the analysis and subsequent selection of the proposed project alternatives. Similar to portfolio theory in finance, an organization may wish to select a portfolio of IT projects that have varying levels of risk, technological complexity, size, and strategic intent (McFarlan 1981; Marchewka and Keil 1995). An IT project portfolio mainly comprised of projects with low risk or those that do not attempt to take advantage of new technology may lead to stagnation. The organization may not move ahead strategically and the IT employees may fail to grow professionally due to lack of challenge. On the other hand, an organization that focuses too heavily on risky projects employing cutting-edge technology may end up in a precarious position if the IT projects experience serious problems and failures. Learning from mistakes can be useful, unless the same mistakes are repeated over and over. Thus, an organization should attempt to balance its IT project portfolio with projects that have varying degrees of risk, cutting-edge technologies, and structure.

Unfortunately, as Harold Kerzner (Kerzner 2000, 120) points out, "What a company wants to do is not always what it can do." He contends that companies generally have a number of projects that they would like to undertake, but because of

The following provides a suggested outline for developing and writing a business case:

### *Cover Page*

- Title and subtitle
- Author and address
- Date

### *Executive Summary*

- Brief description of the problem or opportunity
- Brief description of organization's goal and strategy
- Brief description of project's MOV and how it ties to the organizational goal and strategy
- Brief description of each option or alternative analyzed
- Brief explanation of which alternative is being recommended and why

### *Introduction*

- Background
- Current situation
- Description of the problem or opportunity

- Project's measurable organizational value
- How achieving the project's MOV will support the organization's goal and strategy
- Objectives of writing this business case

### *Alternatives*

- Description of alternative 1 (Base Case)
- Description of alternative 2 ...
- Description of alternative N

### *Analysis of Alternatives*

- Methodology of how alternatives will be analyzed
  - \* Data collection methods
  - \* Metrics used and explanation why they are relevant
- Presentation of results that compares each alternative
  - \* Metrics
    - « Sensitivity analysis
    - \* Risks
      - « Assumptions
- Proposed recommendation
- Required funding and support

Figure 2.5 Business Case Template

limited resources, they must prioritize and fund projects selectively. Depending on the demand for IT professionals or the state of the economy, it is not always feasible to hire new employees or to have them trained in time.

### The IT Project Selection Process

Although each organization's selection process is different, this section describes the general process for selecting and funding a given project. The selection process determines which IT projects will be funded in a given period. This period can be for a quarter, year, or a time frame used by the organization. In order to weed out projects that have little chance of being approved, many organizations use an initial screening process in which business cases submitted for review are compared with a set of organizational standards that outline minimum requirements.

Projects that meet the minimum requirements are then forwarded to a decision-making committee of senior managers who have the authority to approve and provide the resources needed to support the project. On rare occasions an individual might make such decisions, but most organizations of any size prefer to use committees. The committee may compare several competing projects based on the costs, benefits, and risks to projects currently under development and to those already implemented. Projects selected should then be assigned to a project manager who selects the project team and then develops a project charter and detailed plan.

### The Project Selection Decision

Even though each project proposal should be evaluated in terms of its value to the organization, it is important to reiterate that IT projects should not be undertaken for technology's sake. The decision to approve an IT project requires a number of conditions be met:

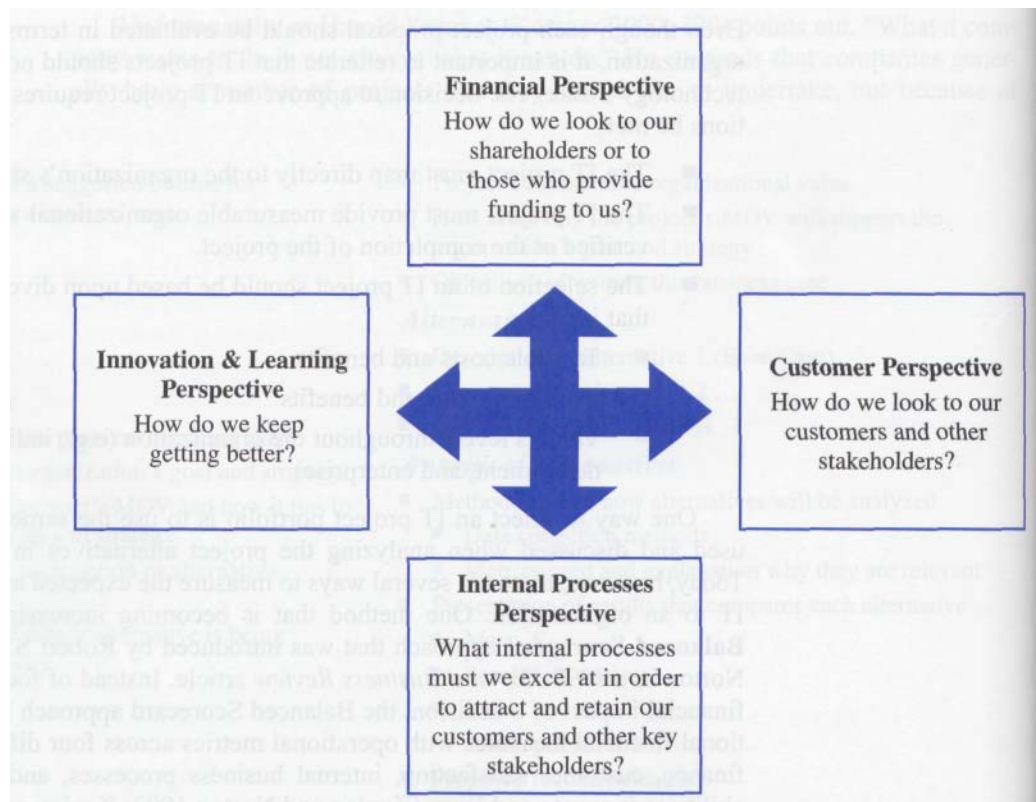
- The IT project must map directly to the organization's strategies and goals.
- The IT project must provide measurable organizational value that can be verified at the completion of the project.
- The selection of an IT project should be based upon diversity of measures that include:
  - « Tangible costs and benefits "
  - Intangible costs and benefits
    - \* Various levels throughout the organization (e.g., individual, process, department, and enterprise)

One way to select an IT project portfolio is to use the same methods that were used and discussed when analyzing the project alternatives in the business case. Today, however, there are several ways to measure the expected and realized value of IT to an organization. One method that is becoming increasingly popular is the **Balanced Scorecard** approach that was introduced by Robert S. Kaplan and David Norton in a 1992 *Harvard Business Review* article. Instead of focusing solely on the financial impact of a decision, the Balanced Scorecard approach helps balance traditional financial measures with operational metrics across four different perspectives: finance, customer satisfaction, internal business processes, and the organization's ability to innovate and learn (Kaplan and Norton 1992; Kaplan and Norton 1993).

An organization that utilizes the Balanced Scorecard approach must create a set of measurements, or key performance indicators, for each of the perspectives

illustrated in Figure 2.6. In turn, these measures are used to create a report or scorecard for the organization that allows management to track, or keep score, of the organization's performance. The four perspectives provide a balanced approach in terms of tangible and intangible benefits and long and short term objectives, as well as how each perspective's desired outcomes and drivers impact the other perspectives.

- Financial perspective*—The Balanced Scorecard approach encourages managers to consider measures other than traditional financial measures for strategic success. Most financial measures are useful for understanding how an organization performed in the past, and some have likened this to steering the ship by watching the wake. Traditional financial measures, however, are still important and can be a cornerstone for ensuring that an organization's strategies are being implemented properly. More importantly, the Balanced Scorecard approach provides a means for linking financial performance with customer focused-initia-tives, internal operations, and investments in employees and the infrastructure to support their performance. Although traditional financial measures that include operating income—ROI, NPV, IRR, and so forth—are still useful, many organizations are now using new financial measures as well. One financial measure that has been receiving a great deal of attention and scrutiny recently is **Economic Value Added (EVA)**. EVA is a measurement tool to determine if an organization is earning



**Figure 2.6** A Balanced Scorecard Approach

more than its true cost of capital. Supporters of EVA believe it provides a clearer picture on whether management is creating or destroying shareholder wealth. EVA is calculated by considering the cost of debt (e.g., the interest rate a bank would charge) and the cost of equity (e.g., what shareholders could earn elsewhere). Subsequently, a positive EVA indicates that positive wealth has been created.

- *Customer perspective*—How an organization performs in its customers' eyes largely determines customer satisfaction. In turn, satisfied customers can mean repeat business and referrals for new business. As a result, measures or targets for customer satisfaction can be linked to financial rewards. They create a value chain for establishing customer-focused initiatives that can be linked to financial performance. Customer-based measurements may focus on areas that determine the level of satisfaction with the products and services of the company and how well those product and services are delivered.
- *Internal process perspective*—The internal process perspective focuses on the processes—both long term and short term—that an organization must excel at in order to achieve its customer and financial objectives. Customer satisfaction can be achieved through improved operational activities by the organization, which in turn leads to improved financial performance. Therefore, internal-based measurements should focus on the efficiency and effectiveness of the organization's processes.
- *Innovation and learning perspective*—The abilities, capabilities, and motivations of the people within an organization determine the outcomes of the operational activities, financial performance, and levels of customer satisfaction within the organization. Thus, an organization relies heavily on its people not only to support the other three perspectives, but also to provide continuous improvements in these areas. An organization's ability to innovate and learn at the individual level is critical for supporting the organization as a whole. Therefore, the Balanced Scorecard approach gives considerable support to the importance of investing in the future by investing in people and makes investing in human infrastructure at least as important as investing in technical and physical infrastructures. Measures for the innovation and learning perspective may include training, certifications, and employee satisfaction and retention.

By measuring the value of an IT project across these four areas, the scorecard approach compels an organization's management to consider the impact and context of a project from an organization-wide view. It also limits the potential for overemphasizing traditional financial measurement at the expense of perspectives that include both tangible and intangible benefits. Still, the Balanced Scorecard can fail for a number of reasons (Schneiderman 1999):

- The nonfinancial measurement variables are incorrectly identified as the primary drivers for stakeholder satisfaction.
- Metrics are not properly defined.
- Goals for improvements are negotiated and not based on stakeholder requirements, fundamental process limits, or capabilities.
- No systematic way to map high-level goals with subprocess levels where the actual improvement activities reside.

- Reliance on trial and error as a methodology for improvement.
- There is no quantitative linkage between the nonfinancial and expected financial results.

The Balanced Scorecard approach is an overall performance management system that is useful for selecting all projects in an organization, monitoring their progress, and then evaluating their overall contribution. As illustrated in Figure 2.7, the MOV concept introduced earlier supports the Balanced Scorecard approach.

The MOV can be developed and reviewed in terms of how it supports the four Balanced Scorecard perspectives. However, the MOV concept can also support organizations that use other means of identifying a project's value to the organization.

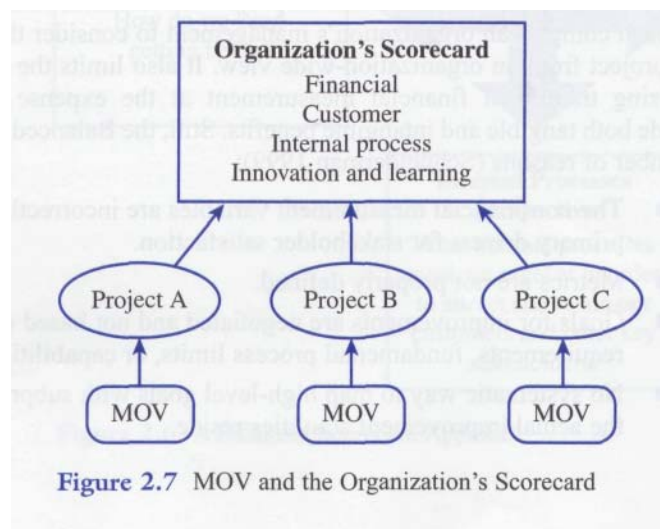
## CHAPTER SUMMARY

A methodology provides a blueprint or template for planning, managing, and controlling a project throughout its life cycle. Although the products of information systems projects are different, many of the processes are the same. In this chapter, a framework for an IT project methodology was introduced. This framework will be used throughout the remainder of this text and provides a basic foundation that will allow organizations to adapt it to their particular needs and from their lessons learned.

In addition, the concept of a project's measurable organizational value or MOV was introduced because it is an important tool for defining a project's goal and value to the organization. The MOV becomes the project's measure of success and must be measurable, agreed upon, and verifiable at the end of the project. A project's MOV must align with the organization's goals and strategies in order to provide value to the organization.

A business case defines the problem or opportunity, MOV, feasibility, costs, and benefits of several alternatives that an organization may choose in order to achieve its goals and strategies. Based on the analysis of the alternatives identified, a recommendation is made to approve and fund a specific project.

The business case is formalized in a report to senior management who may review several proposed projects. The decision to fund a particular project and add it to the organization's project portfolio depends largely on the resources available and the value of the project to the organization. One increasingly popular method for defining value to an organization is the Balanced Scorecard approach. This approach focuses on four perspectives—financial, customer, internal processes, and innovation and learning. Regardless of the selection approach, an organization should make the project selection decision based on a diverse set of measures and in terms of how well the project supports the goals and strategies of the organization.



## REVIEW QUESTIONS

1. What are the advantages of having and following a project methodology?
2. Describe the five phases of the IT project methodology.
3. Why is it important to have deliverables for each phase of the IT project methodology?
4. How can the experiences of and lessons learned by past project team members be incorporated into a project methodology?
5. Describe the conceptualize and initialize phase of the IT project methodology.
6. What is a project charter?
7. What are the advantages of developing a detailed project plan after a project has been approved for funding?
8. Describe the execute and control phase of the IT project methodology.
9. Describe the close project phase of the IT project methodology.
10. Describe the evaluate project success phase of the IT project methodology.
11. Describe the five project management processes.
12. Why can a project that is developed under budget and before its deadline still not be considered successful?
13. What kinds of tools would be needed to support an IT project?
14. How does an organizational infrastructure support a project?
15. What is a project infrastructure?
16. Describe a technical infrastructure that would be needed to support a consulting team working at a client site.
17. Discuss how the project management knowledge areas support the IT project methodology.
18. What is a business case?
19. Why should an organization develop a business case?
20. What is the purpose of selecting a core team to develop a business case?
21. What is a project's measurable organizational value (MOV)?
22. Develop a MOV for an organization that is contemplating developing a corporate intranet.
23. Why must a project's MOV be agreed upon?
24. Describe how a project's MOV can support an organization's goals and strategies.
25. Describe how an IT project can bring value to an organization.
26. What is a base case alternative? Why should a business case even consider a base case alternative?
27. Describe Economic Feasibility.
28. Describe Technical Feasibility.
29. Describe Organizational Feasibility.
30. What other types of feasibility issues should an organization consider?
31. How should the risk of each business case alternative be analyzed?
32. What is Total Cost of Ownership?
33. What is Total Benefits of Ownership?
34. What is the difference between tangible and intangible benefits? Give an example of each.
35. What are some ways of quantifying intangible benefits?
36. Describe the payback method. What are some advantages and disadvantages of this method?
37. Describe the breakeven method. What are some advantages and disadvantages of this method?
38. Describe the ROI method. What are some advantages and disadvantages of this method?
39. Describe the NPV method. What are some advantages and disadvantages of this method?
40. What effect does increasing the discount rate have on a project's NPV?
41. What are the advantages of using a scoring model when comparing several project alternatives? Any disadvantages?
42. What is an IT project portfolio?
43. Why shouldn't an organization always take on less challenging projects?
44. Describe the criteria that should be used to make a project selection decision?
45. Describe the Balanced Scorecard approach.
46. Describe the financial perspective of the Balanced Scorecard approach.
47. Describe the customer perspective of the Balanced Scorecard approach.
48. Describe the internal process perspective of the Balanced Scorecard approach.
49. Describe the innovation and learning perspective of the Balanced Scorecard approach.
50. How does the concept of MOV support the Balanced Scorecard approach?

## EXTEND YOUR KNOWLEDGE

- Using the Web or the library as a resource, write a one-page position paper on the Balanced Scorecard approach. Why does this approach seem to be gaining popularity?
- Determine the Total Cost of Ownership (TCO) and Total Benefits of Ownership (TBO) for purchasing, maintaining, and supporting a personal computer of your choice over the next three years. You may want to use a spreadsheet package to conduct your analysis.
- Analyze the TCO and TBO that you conducted in Question 2 using the payback, ROI, and NPV methods.
- Create a scoring model to analyze whether to purchase a new car. Your alternatives are: keep your current mode of transportation, purchase a used car, or purchase a new car. Be sure to include both tangible and intangible costs and benefits.
- Develop a Balanced Scorecard for an organization contemplating an Internet-based application that would allow its customers to look up their order status online.
- Suppose a bank's goal is to gain competitive advantage by developing tighter relationships with its customers. Its strategy is to create focused differentiation through a customer relationship management (CRM) system. Develop project MOV and discuss how this MOV supports the goal and strategy of this organization.

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