1

Introducing Information Systems Project Management

Themes of Chapter 1

- What are information systems?
- What is project management?
- What characteristics define an effective project manager?
- What principles are important in project management?
- What techniques are useful?
- What skill sets are important?
- What is the life cycle of an information systems development project?
- What are the stages in the information systems development life cycle?
- Why is there a need for good information systems project managers?
- How is the balance between sociocultural and technical factors achieved?
- What are the ethical values of a good project manager?

This chapter introduces many of the themes that will be discussed fully later in the book. It looks first at our application domain of information systems projects and then describes what project management is and what the characteristics of an effective

project manager are. It points out the skill set needed by a project manager for the successful completion of an information systems project. It outlines principles and techniques that are important for a project manager to succeed. The information systems project development life cycle is defined in five stages, and its usefulness for successful project development is described. The various stakeholders who play key roles to a successful information systems project are also described. These stakeholders include the technologists and the various types of user, both internal and external to the organization. This chapter also describes why there is a need for good project managers in the information age and the ethical values that such project managers need to have. Finally, this chapter describes what is presented in the rest of the book and how the content of this text is designed to provide a balance between sociocultural and technical aspects of information systems project management. In the book we will look at cases coming from Unites States, United Kingdom, Australia, and elsewhere, describing information systems successes and failures (we learn from both) and sometimes projects that have been turned around into successes. First we look at Exhibit 1.1, which is a brief account of a successful project.

Exhibit 1.1 AAHELP: A Successful Project

You will not have heard much if anything about the computer project described here for the British Automobile Association (AA). Why? Because it was a success, not newsworthy at all—indeed, perhaps commonplace. The system nevertheless won the British Computer Society's Information Systems Management award. The system proved itself excellent in three categories: the impact of the information systems (IS) on the performance of the organization; the quality of the relationships with customers, users, and systems providers; and the management of the development and operation of the system.

The AA provides roadside assistance to its 9 million members and has the world's largest patrol force of 3,600 people. To support members who require assistance, it developed a PC system known as AAHELP at a cost of 35 million British pounds (US$70 million). The system has delivered quicker help to members, improved customer satisfaction, and led to better resource planning.

Much of its success can be attributed to the change management program. Indeed AA sees the system as part of an ongoing process of change. Another point to its success was that the AA sees IS and the business working closely together. There is no need to "build bridges." IT and IS are well integrated in the organizational structure.

It was a large ongoing project, and it was divided into several phases. As the first phase proved successful, they got the board's support for the next phase and so on. None of these phases lasted longer than 6 months. This added cost to the project but also gave flexibility so that results from each phase could lead to changes in the next. Prototyping was used to check the validity of designs before further major development work. All of this concerned the management of risk, which was seen as a crucial issue.

The project management methodology called PRINCE was used to develop AAHELP. Quality was assessed by a project assurance team. The project was overseen by a project board and supporting teams. The IS/IT team was 70 strong, with most work done in-house (with some outsourcing). Everyone was seen as "owning" the system, with problem solving and brainstorming *together* leading to an excellent team spirit.

Teams were assigned for infrastructure acquisition and installation, design, programming, configuration management, testing, user acceptance, and maintenance. User involvement was also seen as key, so relevant business managers chose five representatives from the user population who became full-time members of the team. They included patrols, call handlers, and dispatchers. User requirements were translated through a joint application development (JAD) workshop, in which users and technologists worked together. When the system was implemented, participants at the workshop acted as champions of the new system.

The system can handle 6 million calls a year, and 80% of these are dispatched automatically to patrols without manual intervention. Only a proportionally few calls required the intervention necessary in the previous system. The system includes a geographical information system (an electronic map of the UK with important reference points), a diagnostics system (to identify the problem for any motor breakdown), automatic deployment of the patrols to the customer, and a system to handle communications between the patrol and the operations center.

But the media are not very interested in AAHELP—it is a story of a successful IT project, and thus is not newsworthy!

Adapted from IT at the Heart of Business, by G. Fitzgerald, 2000, London: BCS. (Note that the explanations to the technical terms used here will be given in the book.)

1.1. What Is an Information System?

Before addressing the question "What is project management?" we look first at information systems, as in this book we are concerned with the project management of information systems projects. The growth and preponderance of information systems—i.e., the applications of information and communication technology (ICT)—affect every aspect of our daily work life in one way or another. Information systems have greatly influenced the individual and society as a whole, and this process will continue and grow even further.

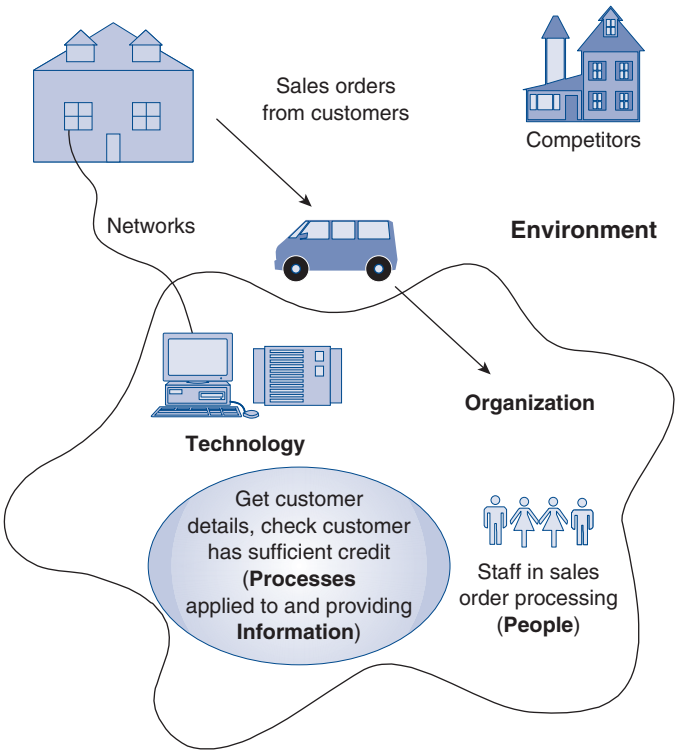
We will look at *information* and *system* separately before defining an information system. ***Information*** comes from selecting, summarizing, and presenting facts in such a way that it is useful to the recipient. Information is therefore meaningful and significant in a particular context and is useful to support decision making in that context. An information system in an organization provides information useful to its members and clients. This information should help it operate more effectively. The ***system*** part of "information system" represents a way of seeing the set of interacting components, such as people (e.g., systems analysts, business users, and line managers), information and communications technology (e.g., computer hardware devices, a user interface, communications networks, and the World Wide Web), and procedures (e.g., business processes and business rules for good project management). We can now define an ***information system***:

An **information system** is a system that assembles, stores, processes, and delivers information relevant to an organization (or to society) in such a way that the information is accessible and useful to those who wish to use it, including managers, staff, clients, and citizens. An information system is a human activity (social) system that is supported by information and communications technology.

The information might concern an organization's customers, suppliers, products, equipment, procedures, operations, and so on. Information systems in a bank, for example, might concern the payment of its employees, the operation of its customer accounts, or the efficient running of its branches.

There is almost no activity in our daily life that has not been affected by information systems. Nowadays, information systems are normally reliant on ICT—that is, the hardware, software, and communications elements—but information systems are more than that. They are the combination of IT and its application in organizations, including human aspects (the users and other stakeholders) that make the technology into something applied and useful for the organization. This is illustrated in Figure 1.1 for a sales order processing system.

❖ **Figure 1.1** An Information System Supporting Sales Order Processing



Think for a moment about communication, travel, banking, shopping, entertainment, education, privacy, security, and the like, and consider how in the last decade or two we have changed the way we deal with these or even perceive them because of the impact of information systems and information and communications technology.

For example, the Internet has changed the way we think of shopping. It enables us to search, find, order, and pay for a product in a few minutes without having to leave the home or the office. Even enthusiasts for technology such as software engineers and systems designers did not expect so much progress in such a short time. It is now no longer a matter of whether you will adopt a new tool but when and how. Information systems pervade all aspects of life, at home as well as in the office, school, and hospital.

1.2. What Is Project Management?

We are concerned in this book with information systems projects. We have already defined an information system, and a ***project*** can be defined as follows:

> A **project** is a non-routine, one-time job limited by time and budget to meet a specified need of the customer.

Thus a project is temporary (although the time span may be from a few days to a few years), it has a particular purpose for the customer (sometimes referred to as the project sponsor), and it requires resources (the budget allocated will be for people, technology, and other resources).

Computers were first used in scientific projects, then for business applications, and later on for tasks in the home. Information system applications that initially were intended to handle specific tasks have increasingly become more complex and sometimes now involve integrating multiple systems. The development of these large and complex information systems demands more sophisticated processes for planning, scheduling, and controlling. The demand on resources, including human, financial, structural, and organizational resources, for the development of these systems has also increased. However, information systems executives are increasingly challenged to justify huge expenditures for information systems development in value-added terms. They are also required to comment on the likelihood that the information system will be delivered on time and within budget, performing the functions expected of it. Information systems projects are notorious for budget overrun and delay and not delivering the functional promises. In other words, the challenges of satisfying rising expectations for information systems require excellent *project management.*

Whether the domain of the project is information systems, production, operations management, or whatever, project management remains the same in principle. The following definition is provided by the Project Management Institute (PMI):

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements.

The topic of project management has been traditionally covered under the discipline of production and operations management, but it is relevant in many disciplines. Because of the potential organizational impact of information systems and its mixed record of success, good project managers are in very high demand in that field of practice because they play such a critical role in the development and delivery of quality information systems. In recent years, therefore, disciplines such as information systems have recognized the importance of project management skills for information systems *and* management professionals (and sometimes engineers) involved in developing information systems projects. Information systems curricula have been increasingly revised to incorporate courses that deal with project management principles. Project management skills are necessary for a team leader who is responsible for channeling collective team activities to produce an effective information system within budget and in a timely manner with the required functionality.

Think of a typical information systems project: It could involve Web development, an online checkbook, a travel organizer, an accounts receivable system, an inventory control system, or a flight simulator.

For any of these systems to be developed or modified successfully, several activities must take place to varying degrees. Although there are different terminologies applied to these stages, the activities relate to the *initiating, planning, developing, implementing*, and *closing* of a project. These five stages, shown in Figure 1.2, will be detailed further in Section 1.6.

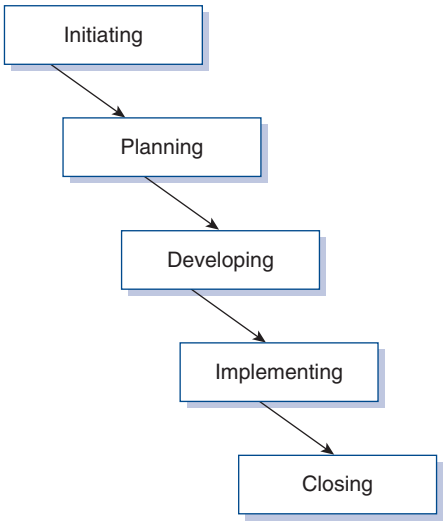
The quality and usefulness of the outcome will depend on how well these activities are performed. The project manager is the person who is responsible for making sure that these activities occur on time and with the right emphasis. An effective information systems project manager must not only understand the technology and its impact but also the role that each of these activities plays in the successful development and implementation of an information system. Thus this book emphasizes the impact of an information system on people and the organization—it is concerned with the sociocultural aspects of technical change and not just limited to the technical change itself. Again, it is also concerned with the role of and impact on general managers in an information systems project, and not just the technologists.

Interestingly, most books on the subject concentrate on the technical side, yet our interviews of project managers as well as our experience indicate that the bigger concern to project managers are the nontechnical aspects. In this book we have a balance of the two.

1.3. Why "Information Systems" Project Management?

Although the concept of project management has been around for some time and it has been a part of the curricula of other disciplines, the principles of project management

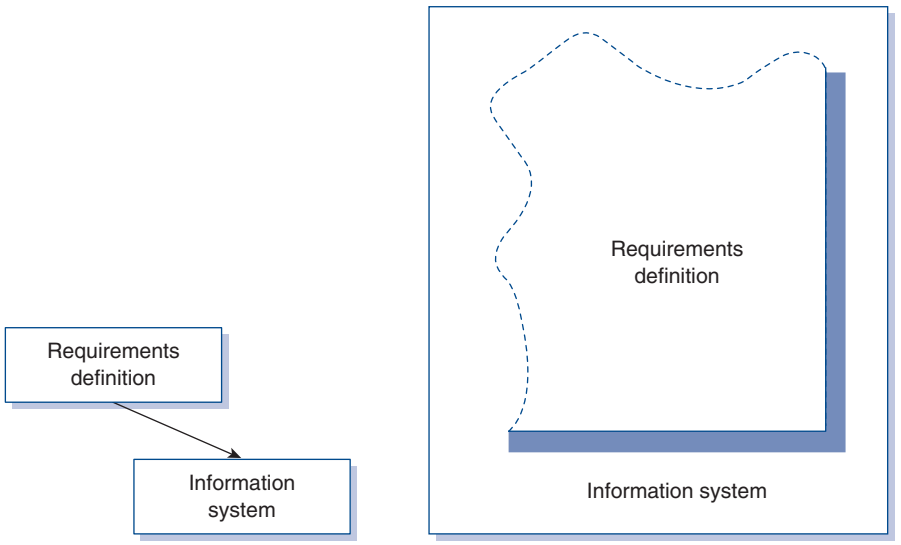
❖ **Figure 1.2** Life Cycle of an Information Systems Project—A First Approximation



and related techniques and tools are particularly important for the design, development, and implementation of information systems projects. Further, the management of an information systems project requires additional knowledge and abilities that are expected of information systems professionals. Rapid changes in technology and enhancements require continual self-training and self-learning. Newly identified potential uses of information systems seem to be discovered almost daily, affecting all levels in the organization. This rapid change also means that the project description and its features may change before the project is complete—not to mention the user expectations of the project outcome. It is important to understand this dynamic aspect of information systems project management relative to the traditional project management function.

This is a recent dimension even in the domain of information systems. Information systems have traditionally been developed on the assumption that systems requirements are defined at the beginning of the project and will not change. This would now be considered naïve and unacceptable. The business environment might change as the information system is developed, and there may be changes in the organizational structure (of customers and suppliers as well). Project managers must be aware that the information systems application can and will change during its development. Changes to requirements are the norm, and this is reflected in Figure 1.3. This suggests that in the "real world" it is not simply a process of requirements being communicated and simply incorporated into the new system as a "one off" exercise. The requirements may change as the project develops. The process is much more sophisticated.

❖ **Figure 1.3** The Old and More Up-to-Date Views of Requirements in an Information Systems Project



Requirements definition seen as a complete stage before IS development

Requirements definition seen as changing throughout the IS development project

All this requires a project manager of an information systems project to have a clear understanding of information: how it is generated, how it is used, how it is maintained, and how it is integrated to serve different functions within an organization. End-users and other stakeholders often become a part of developmental activities in addition to the project team members who have specific responsibilities. An effective information systems project manager must have qualities and skills that relate to the management of the information systems function as well as principles and concepts that relate to managing a project. It is clear that without a project manager there may be many more arguments due to sectional interests that could slow down, or perhaps stop, the project, and should the project finish it is likely to be much less directed to the interests of the organization as a whole. Exhibit 1.2 summarizes important project management skills that are required to make a successful project much more likely.

However, it is unlikely that all these can be covered adequately by any one person, and hence we can understand the advantage of the team approach to project management.

Exhibit 1.2 Project Management Skills for an Information Systems Project

- Ability to communicate project information effectively
- Ability to document the flow of project information effectively
- Ability to manage human resources for a project effectively
- Ability to define project scope clearly
- Ability to understand the technical aspects of a project
- Ability to manage the project within the fiscal budget
- Ability to manage changes in requirements for a project
- Ability to maintain support for a project
- Ability to provide leadership
- Ability to manage time effectively
- Ability to solve problems
- Ability to close a project correctly

1.4. Project Management in Modern Organizations

Information systems using information and communications technology (ICT) can empower workers by enabling them to be more productive and by giving them greater control of their tasks. This means organizations reevaluate job descriptions frequently and add management responsibility to what was traditionally considered end-user-level work. As a result, separate and distinct tasks in the traditional work environment are now integrated and managed by the same person through the use of ICT. This trend has gradually reduced the need for some middle-level managers who were primarily responsible for work planning as well as horizontal and vertical communication with other middle-level managers, subordinates, and superiors. These middle-level managers also made sure that "the left hand knew what the right hand was doing," thus avoiding overlap and confusion and also controlling the work flow. This essential function must not be lost in the change process.

As technology reshaped the role and definition of the work unit, it made ordinary tasks more abstract and in need of instant coordination with other tasks that were infeasible to accomplish without technological help. In other words, technology has played a role in its own creation. More and more, jobs have become increasingly abstract and involve sense-making with an increased number of variables influencing decision outcome. This has created the need for more specialized careers that did not exist before. These new careers involve the need for greater technology application in the context of the business mission, goals, and objectives. Integration of technology across functions and organizations has increasingly become a norm. Technology has

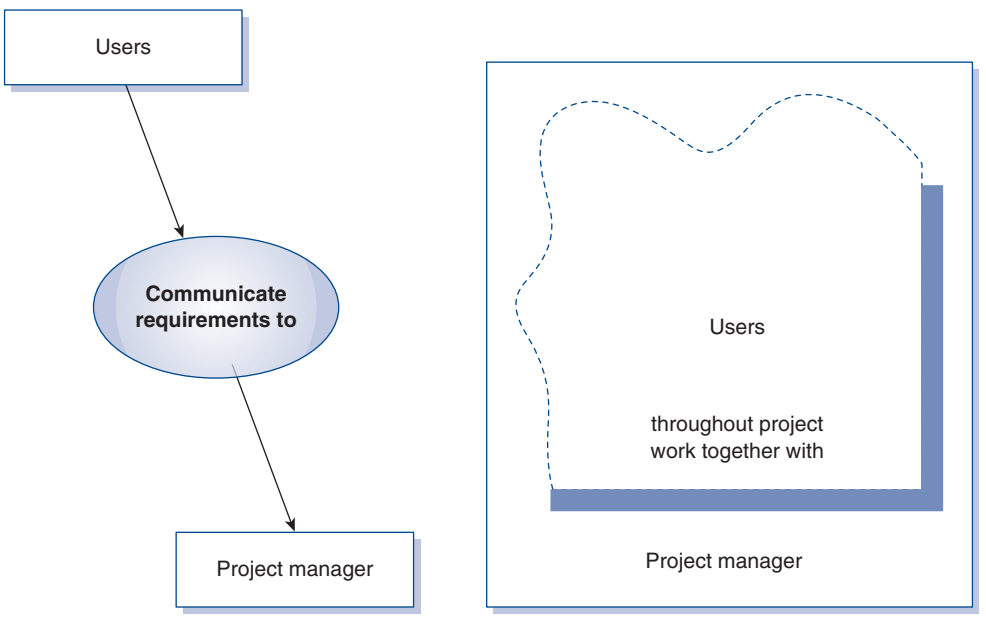
influenced career options in different ways. On the one hand it has increased the responsibility, influence, and complexity of most jobs, and on the other hand it has created opportunities for those with the know-how to use and manage it effectively.

However, the growth of ICT and its increased application created the challenge of keeping up with information systems development needs. Delayed and over-budget information systems projects became the norm rather than the exception. A 2-year backlog for the development of an information system was considered almost normal in many organizations. This could not go on. Fortunately, rapid development methodologies, techniques, and tools may have helped to ensure a more timely response to information systems development needs. Here technology itself is being used to help technology applications.

The traditional information systems development process involved a dichotomous relationship between developers and systems analysts on the one hand and users on the other. Figure 1.4 is a reflection of Figure 1.3, but with the recognition of user involvement in information systems development activities. Users and other stakeholders are now playing an increasingly critical role in any IS development project. We will say more about what we mean by the "user" in Section 1.7.

With the increased need for integrated information systems that closely align with organizational goals and objectives and address the user expectations came the job of information systems project management. While project management principles and

❖ **Figure 1.4** The Changing Relationship Between Users and the Project Manager



techniques have been used elsewhere, such as in the construction industry (and discussed in the discipline of operations management), its application for the development of information systems is newer, rapidly growing and becoming more sophisticated.

Project management has become one of the most sought-after positions in service as well as in manufacturing industries and in private as well as public organizations. The traditional job of the information systems analyst has been gradually redefined to go beyond the responsibilities of requirements analysis, design, development, and implementation. Project management has gradually replaced the traditional middle-management position. By its nature, the job of the information systems project manager combines a set of responsibilities that span from understanding the technology to managing human resources to addressing organizational needs. Its primarily role involves managing all aspects of an information systems development project from beginning to end and delivering it *as specified*, *on time*, and *within budget.* Therefore, critical project management dimensions relate to project scope, time, and budget.

1.5. Principles, Techniques, and Tools

An information systems project starts when someone within an organization initiates the idea of a new information system or suggests the modification of an existing one. Initiation is the first step among many steps necessary for the development and implementation of a successful information system. Whether the initial idea is carried forward into design, development, and implementation is influenced by a variety of factors, some of which are tangible and easier to measure (such as the cost of hardware, software, and personnel), and some of which are intangible and harder to assess (such as organizational and political support).

Large organizations often employ some form of ***information systems portfolio committee*** that evaluates and recommends information systems project proposals. The portfolio committee will normally follow a priority scheme that includes, among other things, the elements shown in Exhibit 1.3 (the question of priorities is raised further in chapter 2):

Exhibit 1.3 Prioritization Factors

- The strategic and operational needs of the organization as determined by top management
- User requests for information systems increasing the efficiency of operations or providing information not presently available
- Views of all stakeholders and their "political" force
- Particular issues, such as "customer value," "improved processes," or concentration on particular performance measures
- Major revisions to existing applications owing to changes in the organization or its environment
- New opportunities, perhaps owing to the availability of new technology
- Competitive pressure—a matter of "keeping up with the competitors"

In smaller organizations, senior management or the "owner" usually makes that decision.

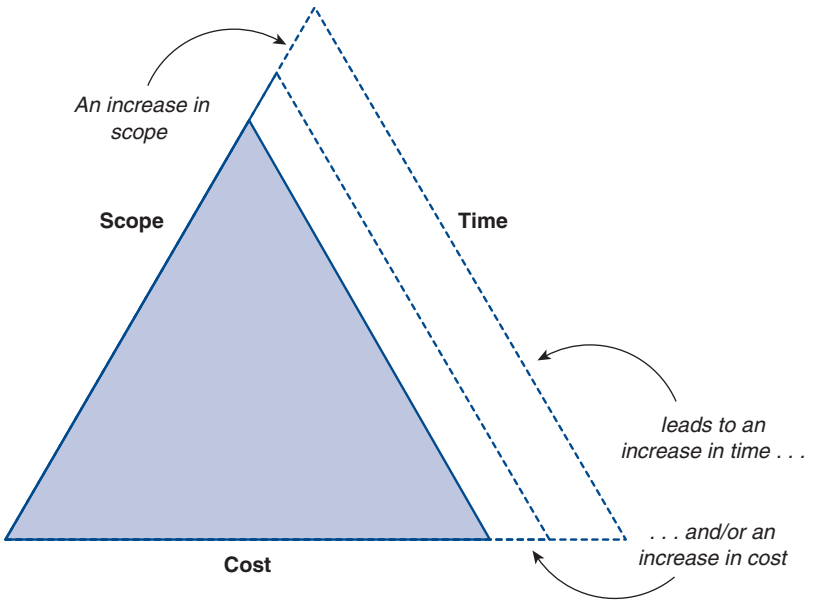
Once a project is recommended for development and its budget is approved it will go through the project development life cycle that ends with the implementation of the proposed idea and the formal closure of activities, contracts, and documents. An ***information systems development project*** can therefore be defined as follows:

> An **information systems development project** is a non-routine, one-time job limited by time and budget involving the application of information and communications technology by people in an organization to meet the specified needs of a customer.

The triple constraints of *scope, time*, and *cost* affect all information systems projects regardless of size or type and will be reflected through the necessity of defining the project as specified, on time, and within budget. These triple constraints directly and proportionally affect each other like three sides of a triangle, as shown in Figure 1.5. For example, increasing the scope of a project will increase its cost and/or the time to develop it. Reducing the time to delivery is likely to increase the cost of the project.

The project manager is responsible for the successful delivery of this one-time job within the limits of allocated resources. To be successful, the project manager must

❖ **Figure 1.5** The Triple Constraints of Scope, Time, and Cost



start by getting answers to some important questions relative to the issues listed in Exhibit 1.4. Without the project manager there will be real problems, as there will be no one to galvanize the team together toward the goals of the project.

Exhibit 1.4 The Issues for the Project Manager to Consider

- Specific objectives of the project
- The expected delivery time for the project
- The limit on resources
- The extent of available talent pool
- Key stakeholders—people who initiated the idea and those who will be recipients of the final product
- Top management support
- Interorganizational relationships, especially for large projects

Let us look at these issues. A particularly important function of the project manager concerns project scope. The project scope is a key success indicator, as it defines objectives, is essential to evaluating resources, and is critical to achieving customer satisfaction. One of the persistent problems in information systems projects is the phenomenon known as ***creeping scope***. This problem occurs when stakeholders or proponents of the project gradually expand their requests, adding new features or modifying initial specifications. They may expect these improvements at the same cost. If not controlled, this creeping process will eventually affect customer expectations—they will be too high—and thereby the evaluation of the project outcome leads inevitably to disappointment.

To save time and get the project underway, inexperienced project managers often spend too little time on developing a clear and agreed-upon description of the project scope and detailed requirements and start development activities prematurely. This will eventually haunt the project team in general and the project manager in particular as the project gets closer to the finishing line and customers have a clearer understanding of the project functions and can come up with even more requests. Not only is the due date affected by the scope creep, but also resources and other projects will be affected. After completing a project, team members and the project manager may have been assigned to another project that has been scheduled to start when the current project was due to finish.

However, there is a balance to be struck here. Scope needs to be clearly defined, but within that, some change in requirements has to be expected and dealt with. The world does not stand still! Thus there needs to be some built-in flexibility regarding changes in requirements. We will return to this problem later.

Once the scope is clearly defined, resources are estimated and the completion time for the entire project is established. A clearly defined scope helps the project manager estimate the time, cost, and human resources required. The available talent pool is

often a key factor in deciding whether to outsource some aspects of the project. ***Outsourcing*** refers to the procurement of talent, such as consultants and suppliers, outside the organization, sometimes overseas. The latter is frequently referred to as ***offshoring***. This is such an important topic nowadays that we devote the whole of chapter 11 to outsourcing and offshoring.

The project manager must evaluate carefully what resources are available and for how long and with what flexibility. Highly qualified individuals and domain experts may be scheduled to work on separate projects, and as a result their time is allocated based on what was initially agreed upon. In such cases, the project manager must make sure that adequate human expertise with necessary flexibility is allocated to the project for the project to be completed in a timely manner. Estimating resources is an important responsibility for a project manager, and it is extensively discussed later in the book (see Section 5.3, for example).

The next two issues in Exhibit 1.4 relate to key stakeholders of the project and top management support, both of which are considered critical for the success of any project although in different ways. It is important to know how to communicate and understand why communication skills are critical. Information systems professionals have proved much better in this role than ICT experts, who are more geared to the technology than people and organizations. This is only one reason why we emphasize information systems project management rather than software project management in this book. Another reason is the fact that the software and technology aspects represent only one aspect of an information systems development project.

The project manager must be able to communicate properly with key stakeholders of the project throughout the project development life cycle. The stakeholders of a project include individuals at all levels with interest in the project and its final product (Exhibit 1.5). We look at stakeholders in more detail in Section 1.7.

Exhibit 1.5 Some of the Stakeholders of an IS Development Project

- Top management
- Those who fund the project, such as functional area managers
- Those who directly work on the project, such as team members
- Primary customers
- Users of the project outcome
- Suppliers

Some key users may be included in the development team. User involvement in information systems development activities is strongly recommended because it gives users the opportunity to take part in the project development, feel responsible for the project outcome, and provide continual feedback. They will feel that they have a real "stake" in the project and are therefore more likely to cooperate and help to ensure the success of the project.

Top management support is also critical to the success of a project for reasons of support as well as recognition. The project manager must initially succeed in convincing top management that the proposed system has organizational value and serves the overall business strategy that the organization has adopted. Without initial support by top management the project will not start, and without the continued *full* (that is, not lip-service) support of top management its development will be hampered. If it is not seen as a top management priority, it will not be a project that people in the organization need to care about much or give the time and effort necessary for its success. It is therefore also important for the project manager to update top management continually with the developmental activities of the project and to make sure that top management support for the project is sustained. A key vehicle for obtaining continued support is clear and timely communication that informs top management as well as other key stakeholders about project progress and status. In particular, stakeholders would like to know whether the project is making timely progress (that it is on schedule) and is within budget. *It is important to communicate and explain, as early as possible, delays and unexpected costs.* It is the top management that will eventually have to approve additional funds and/or to extend the deadline. Therefore, it is critical to minimize the element of surprise before requesting additional support if it becomes necessary.

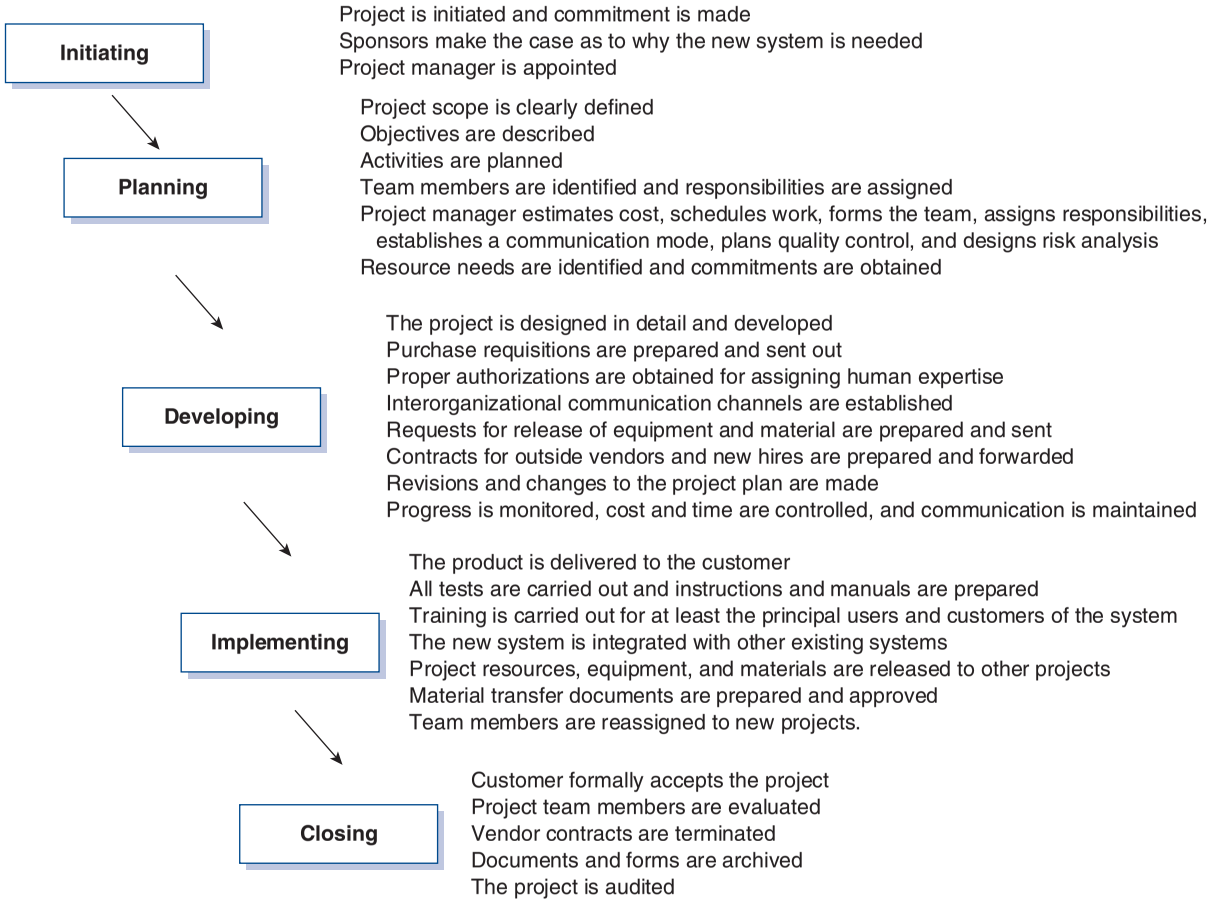
Interorganizational relationships are important particularly for large information systems development projects. Increasingly, information systems are developed to integrate functions and eliminate application redundancy (where the same process is done more than once). The success of such ***integrated*** applications depends on the broad participation of people in those functions that will be affected by the outcome. Further, globalization means that many—if not most—projects have the additional international design considerations to take into account in their scope.

We will look in more detail at the human qualities required by a project manager, but good communication skills are an obvious prerequisite. The project manager should understand and establish appropriate communication modes to inform all interested parties effectively. Early in the project development life cycle, the project manager should identify what works best and establish the process and means of good communications. For example, if email seems to work effectively and with ease for all concerned, then that could be the main mode of communication. However, there are situations or environments in which email systems exist but they are not used for one reason or another. In that case, this communication medium may not be effective unless some behavioral changes take place. What is important is that the message gets communicated effectively by whatever means. But establishing the mode of communication early in the project development life cycle is important.

1.6. Information Systems Project Life Cycle

Every project goes through several distinct stages before it is complete. A typical information systems project involves a spectrum of activities that starts from the initiation phase when the project idea is formed to the delivery phase when the project is complete and team members and management can move on to other projects. The project life cycle gives a useful viewpoint to the project manager to plan activities, allocate

❖ **Figure 1.6** Life Cycle of an Information Systems Project—More Detailed



resources, set milestones, monitor progress, and communicate developments. While there are many different project life cycle models, a typical generalized one was introduced in Section 1.2. Figure 1.6 is a more detailed version of Figure 1.2. In chapter 3 we will also look at more formalized methodologies to develop information systems.

- **Initiation stage:** At this stage a project is initiated and commitment is made. A person, group, unit, or units within the organization may initiate the need for a system. This might have been identified when a problem arises in the organization or a need for change is recognized. Usually a process is then followed to determine whether the idea should be supported or not. Sponsors of the idea must make the case as to why the new system is needed and how it helps organizational objectives. This is a challenging task since there are often competing proposals for limited resources. Proposals that are closely aligned with organizational strategic objectives have a better chance of receiving top management support. At this stage, someone is appointed as the manager of the project who will be responsible to carry out the project through the development life cycle and deliver the final product, assuming the project comes to fruition. This is the project manager.

- **Planning stage:** At this stage the project scope is defined as clearly as possible, objectives are described, and activities are planned. Team members are identified and responsibilities are assigned. If the project manager was not appointed at the initiation stage, someone will be assigned at the early stage of planning. At this stage, the project manager needs to estimate cost, schedule work, form the team or teams, assign responsibilities, establish a communication mode, plan quality control, and design risk analysis. If there are different information systems proposals for achieving the objectives, a choice needs to be made between alternatives. Sometimes there are constraints that limit choice, but the solution agreed on needs to be technologically reliable, reasonable to schedule, economically worthwhile, and organizationally acceptable. Specific and unique resource needs are also identified and commitments are obtained. For example, depending on the scope and nature of a project, specialized know-how and expertise may be necessary. The project manager must in such cases determine whether in-house expertise is adequate to satisfy the project needs or whether arrangements need to be made to obtain external assistance. Planning activities are critical to the success of project management since they map out what needs to be accomplished, how they are accomplished, how progress is monitored, how quality is controlled, and—in short—how the project is managed. Since estimates of resources and activities are not always projected accurately, planning must allow for some flexibility in this respect. Things are not cast in stone. A project plan may need adjusting during the development phase. However, changing the plan *must* be done following an agreed-upon process. For large projects, a committee is usually responsible for the evaluation and approval of proposed plan changes.

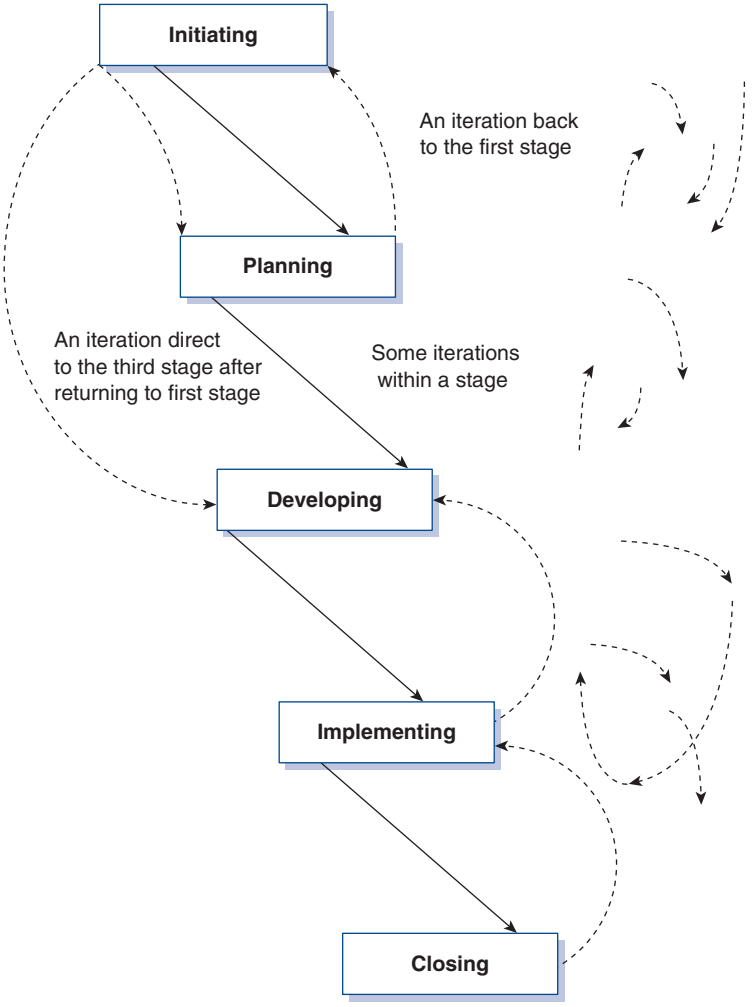
- **Development stage:** This stage, sometimes known as the executing phase, encompasses the detailed design through to, but excluding, the final implementation of the plan. It is important that the design is detailed as it is difficult to estimate accurately if we are unsure of the design. As we will see later, prototyping may be helpful

here. The executing stage as a whole is the stage in which mental and physical activities take place. Activities are coordinated with the aim of delivering the specified information system on time and within budget to the satisfaction of the customer. Here are a few examples that illustrate activity types at this stage of the project development life cycle: Purchase requisitions are prepared and sent out; proper authorizations are obtained for assigning human expertise; interorganizational communication channels are established; requests for release of equipment and material are prepared and sent; contracts for outside vendors and new hires are prepared and forwarded; revisions and changes to the project plan are made following an established process; progress is monitored; cost and time are controlled; and communication is maintained. Regular monitoring that helps to determine that the product is being developed according to specification is critical at this stage. ***Quality assurance*** is obtained through quality control that is built into the process with responsibilities clearly assigned.

- **Implementation stage:** At this stage, sometimes known as the control phase (although we would argue that "control" features throughout the project), the product is delivered to the customer. All tests are carried out and instructions and manuals are prepared. Training is planned and carried out for at least the principle users of the system. The level of user involvement during the system development life cycle will influence the success of these training programs. Such training programs may be specific and limited to certain users or may be more general to include a wide range of users. In any case, training programs must be designed to facilitate the effective use of the system by the customer. Success of the system is directly linked to the effective use and satisfaction of the customer. Poorly designed and badly developed systems are very likely to fail regardless of the implementation efforts. It is important also to take onboard the fact that information systems that are well designed and developed may also fail because of inadequate and improper use. Sometimes, the implementation phase includes integration of the new system with other existing systems. The project manager must be careful not to disrupt other information systems development projects or operational systems and make every effort to minimize downtime. Project resources, equipment, and materials are released and redeployed to other projects. Material transfer documents are prepared and approved. Team members are reassigned to new projects.

- **Closing stage:** At this stage the project is closed from an administrative point of view. Activities at this stage include formalizing customer acceptance of the project; evaluating the project team members; terminating vendor contracts as well as employment of those hired specifically for the duration of the project; archiving all documents and forms relative to the project; and conducting the project audit by individuals other than the project manager or project team. The primary intent for the project audit is to formalize and document the lessons learned, to generate a report that summarizes experiences gained, and to suggest ideas beneficial to future projects. The intent of this project audit is not to point a finger at individuals or to punish anyone. It is a review of facts relative to events, activities, and processes for the purpose of ***organizational learning***. Organizations need to learn from their successes and failures through this knowledge sharing (its ***organizational memory***) and build on this past experience to improve future performance.

❖ **Figure 1.7** Indicating the Potential Added Complexity of a Real Project



However, Figure 1.6 represents an idealistic view of project management. In fact in any project this is likely to be much more complex, with many iterations and jumps. Figure 1.7 attempts to show the complexity of a real project.

1.7. Stakeholders

Here we look at the people who will probably be involved in the development of a computer information system. Following the analysis of David Avison and Guy Fitzgerald, we identify a number of stakeholder groups or individual stakeholders. However, in this text we start with those in the business or organization for whom the

information system is required rather than the technical people. This group is often generically known as the "users," but this is misleading as they are not homogeneous and there is a range of different types of user. Indeed, "users" can also be "developers." We break this category down as shown in Exhibit 1.6.

Exhibit 1.6 Who Are the "Users"?

- **End users** use the system in an operational sense. They may be intermediaries between the system and the business users.
- **Business users** are people in the particular business function that have a need for the system. They might or might not physically interact with the system itself. They are interested in its functions and output, as support for achieving their business objectives.
- **Business management** have responsibility for the business function that the information system addresses and may have been responsible for commissioning the system and financing it from their budget. They are responsible for the strategic use of IT in their business unit.
- **Business strategy management** are those responsible for the overall strategy of the organization and the way that information systems can both support and enable the strategy.

Again, we are describing roles for people here. They may be combined or separated. Sometimes, different categories of user are identified—for example, regular user and occasional or casual user. This categorization is important for determining what type (or types) of user interface may be required in a system or what type of training is needed. Clearly, these will be different for regular users and occasional users. A regular user may not require a lot of help and explanation and just the minimum of interactions, whereas an occasional user will require detailed help and guidance when using the system.

Our next category is external users. These are stakeholders outside the boundaries of the company in which the system exists (Exhibit 1.7).

Exhibit 1.7 External Users

- **Customers or potential customers** use the system to buy products and services or to search for information relating to products. They are generally not employees of the company and thus have a different relationship to the earlier categories of user. Too often, customers are ignored when systems are being designed and developed, even though they are obviously important stakeholders with specific requirements. In some Internet applications this is particularly important.
- **Information users** are people external to the organization who may use the system but are not customers, in that they do not buy anything. Users of a government Web site may just be looking for information on building regulations, for example. This category of user is also often ignored when the system is designed.

- **Trusted external users** have a particular relationship with the organization and may be given special privileges in the system. Suppliers are examples of such users. There are likely to be specific design requirements and security implications for this category of user.
- **Shareholders, other owners, or sponsors** are people who have invested in the organization and have a financial interest. They may be only peripherally concerned with the information systems in the organization, but they will want to ensure that they are contributing to the financial development and success of the organization.
- **Society** includes those people who may be affected by the system without necessarily being traditional customers or users in any way. This is a broad category and relates to people, or society as a whole, who may be potentially affected by the system in some way. People may be put out of work by a system or it may disseminate inaccurate or personal information. Society is an important stakeholder in information systems development, and societal impacts also need to be considered.

Exhibit 1.8 identifies those stakeholders on the information systems development side.

Exhibit 1.8 Stakeholders on the Information Systems Development Side

- **Software engineers or programmers** code and develop programs in an information system using a computer programming language.
- **Systems analysts** specify the requirements for a system and the outline designs and solutions that will meet the requirements. Typically, they are the interface or liaison between the business users/analysts and the programmers.
- **Business analysts** understand the complexities of the business and its needs and liaise with the systems analysts. They are typically from the business side of the organization but adopt this role in the context of a particular development project for a specific period.
- **Project managers** manage the project with particular emphasis on schedules and resources.
- **Senior IT management members** are responsible for IT and managing it overall within the organization.
- **Chief information officer (CIO)** is responsible for IT, IS, and information strategy and aligning them to the needs of the business as a whole. Although usually a member of the IT department, it is essential that the CIO is part of the organization's top management team.

The above groups may not exist as discrete groups in all organizations. The boundaries between them have undoubtedly become blurred over the years. In some circumstances one person may undertake a number of roles, or a group may flexibly undertake all roles as needed. The situation is even more confused by the tendency of the IT industry to have a wide and varied range of overlapping job titles for these roles. Further, many organizations no longer have a rigid separation between the IT systems development side and the business. Often multi-skilled development teams, capable in

both business and IT, are formed for a particular development project, often managed and led by the business units themselves.

In general, we believe that it is desirable that all stakeholders of a system are involved in the whole development process. It is important that an "us and them" attitude does not exist between stakeholders on the information systems development side (Exhibit 1.8) and the other stakeholders. They all have some kind of stake in the success of the information system and need to work together toward a common goal. Good communications will help to make such an atmosphere feasible. In the information systems development process, some users might be part of a group, such as the information systems strategy group, the steering committee, and the development team.

However, if we accept this wider view of the stakeholders of an information systems project, it might be difficult for the project manager to decide how to proceed. For example, how does the project manager evaluate the relative importance of each stakeholder if there is conflict? ***Stakeholder analysis*** is a technique to help project managers in such circumstances (Table 1.1).

Stakeholder analysis is often done in a kind of brainstorming session (see Section 9.2) and then documented as a list or a set of interconnecting circles, sometimes known as a ***stakeholder map***. These stakeholders are then considered as having some relevance or potential input to a system under development, and they then might be consulted and involved. We might consider stakeholders as having higher and lower power (and influence) and higher and lower interest. We may simply monitor those stakeholders who are on the low power/low interest quadrant but involve those stakeholders on the high power/high interest quadrant. Other stakeholders warrant at least to be kept informed. The stakeholder map might look at the needs of each group or individuals. Some practitioners argue that *interest* is too narrow a term and use *attitude* and *confidence* instead. Usually each stakeholder group is considered to have some specific requirement that needs to be considered and addressed in the system. They are seen as groups who have diverse requirements that need to be addressed by the system for it to be successful. Indeed, a project manager might hold a workshop with the key

❖ **Table 1.1** Stakeholder Map

Stakeholder	Attitude	Power/Influence	Actions
Tom (clerk)	Negative—concerned about job	Little	Keep informed and try to reassure job is safe
Doris (manager)	Positive—sees potential increase in status	Medium—but key member of new system	Manage closely and ensure satisfied with potential of new system and her role in it

stakeholder groups at the beginning and at other times in a project. Stakeholder analysis provides a way to make explicit, or give a voice to, the claims of all those stakeholders involved.

1.8. Project Management and Ethics

The discussion of ethics in business courses often generates interesting reactions. Some students see ethical issues less relevant to the business domain. Some consider ethics an individual trait that is formed early in life and influenced by family environment and values and that it is less likely to change later in life. As our thought process evolves through learning, experience, and interaction with others, our values are reaffirmed or reformed. In reality, ethics influences our decisions continually as we try to distinguish right from wrong. Ethical issues in information systems project management are prevalent as we provide estimates of time and cost, evaluate individual performance, communicate completion date, and so on. We estimate project cost and time to the best of our abilities, trying to use our professional expertise and experience. It is unacceptable to falsify these estimates or to exaggerate benefits. Ethical issues are more acute in situations in which there is pressure on the project manager to give "good" news about the due date, progress, safety, accuracy, and the like. It is important to distinguish mistakes from misrepresentation or falsification.

Many companies have codes of conduct to guide employee behavior. Professional organizations have in place codes of ethics that they publicize and make available for their members as well as the public. The appendix at the end of this chapter looks at the Project Management Institute (PMI) member code of ethics and the joint Institute of Electrical and Electronic Engineers and Association of Computing Machinery (IEEE/ACM) code of ethics and professional practice for software engineers. Similar codes are available for other organizations, and many are available on the Web (see, for example, that of the British Computer Society at www.bcs.com). There is a great deal of overlap in professional and ethical codes for different organizations because they share core principles. Decisions have consequences. Information systems project managers must always contemplate the impact of their decisions and continually ask themselves how their decisions affect the stakeholders and how their decisions will be judged by everyone in the organization.

An individual's ethical conduct is influenced by education, family, religion, and work environment to varying degrees. Organizational environment, culture, decision processes, and reward systems also influence employees' belief in doing the "right" thing. The organizational environment is also affected by individuals' conduct. Organizations benefit from the ethical behavior of their employees, and they have a vested interest to promote it. Information systems projects as mechanisms for implementing organizational goals and objectives also benefit from ethical conduct. The ultimate success of an information systems project is based not only on the actual outcome but also on the way it is accomplished. Good means and good deeds go hand in hand; falsifying one leads to falsification of the other.

It is important that the information systems project manager can be trusted and is trusted. Team members are prepared to go the extra mile and put in the extra effort

for leaders they trust and respect. It is hard to define *trust* but we know that individuals are trusted depending on their character, competency, and ethical standing. Project managers who are perceived as political animals or manipulators may succeed for a while by pulling rank or enforcing rules, but they will eventually face resistance and non-cooperation. The project manager leadership should be free of "game play." When team members feel that games are being played or there are hidden agendas, then their interaction will be affected and soon the entire environment will be changed. Project managers need also to build trust among team members, and trusted project managers have an easier job of doing that.

There are situations when all facts are not known and ambiguity may exist. Effective project managers are up front about these situations and explain what they know and what they do not know about a situation. It is important to realize that trust is built over time, and trusted individuals are given the benefit of the doubt in unusual situations. For project managers who have not been on the job or have not worked with their team long enough to build the necessary level of trust, unusual situations may prove more challenging. On the other hand, ambiguous and unusual situations provide unique opportunities for the project manager to demonstrate competency and built trust. It is very important that your team members feel that you want to do the right thing.

In his book *Seven Habits of Highly Effective People,* Stephen Covey suggests that effective managers have ethical characteristics evidenced by respect for the individual, dignity, fairness, pursuit of truth, and helpfulness (see also chapter 7). In situations where there is sufficient funding, support, hardware, software, equipment, and the like and you still see resentment and lack of full cooperation, ask yourself the few questions, seen in Exhibit 1.9.

Exhibit 1.9 Reflections on Ethics

- Have you been true to the purpose of the project?
- Have you treated everyone alike, giving everyone a chance?
- Have you been consistent (do people know where you stand)?
- Have you been fair in your evaluation of others?
- Have you been open to suggestions and opinions?
- Have you accepted responsibilities and admitted mistakes?

These are not ambiguous questions that require a great deal of analysis. You may even be able to ask some of your key team members for feedback on some of these questions. If you have been open about your mistakes and have shown that you respect opinions and suggestions expressed by others, you will get valuable feedback.

If you ask people what they like about their boss, you will be surprised how simple things make a difference: "I like working with my boss because she listens carefully and

explains things clearly," "I like my boss because you always know what he expects from you," "I like my boss because she treats everyone the same," or "I like my boss because he is reasonable." These comments indicate both trust and competency. You cannot develop trust in people who do not know their field and cannot promote confidence in those they work with. Competency must be evident in technical as well as business domains. A software engineer who is well trained to design and develop complex information systems may not necessarily be able to manage an information systems development project. Developing a project involves more than knowing the technical dimension alone. It involves human resource management, conflict resolution, confidence building, networking, coordination, control, and the like. Indeed, a technical deficiency can be made up through the support of the experts, but an ethical deficiency is much more difficult to fix.

1.9. Text Content and Objectives

The intent of this text is threefold. First, to study and understand the *job* of information systems project management, one must know the following:

- What kind of subject area it is
- What it entails
- How it relates to other subject areas
- What opportunities and challenges it provides
- Why it is important for information system professionals

Second, to study and understand what makes a *person* successful as an information systems project manager, one must know the following:

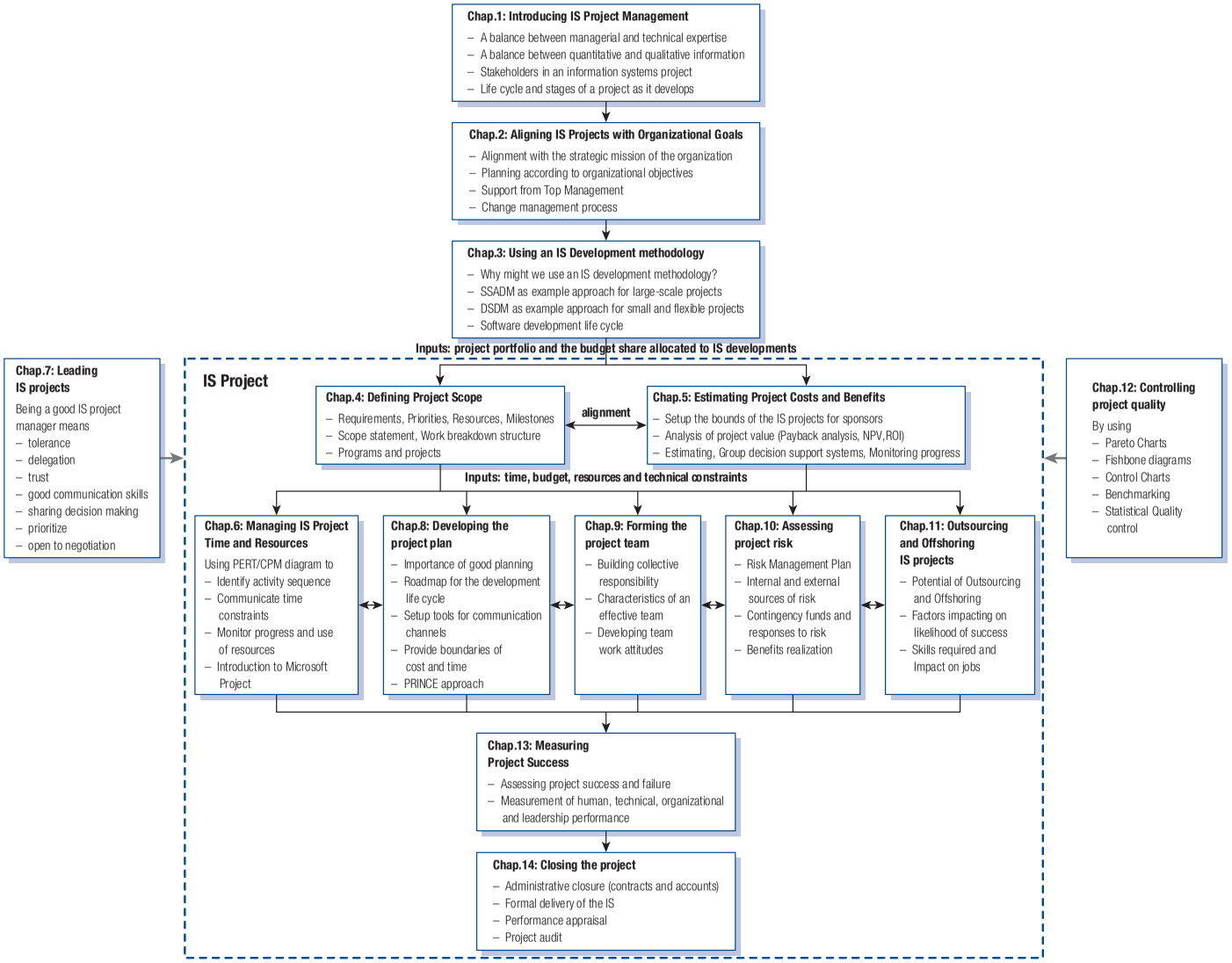
- What kind of skills are needed
- How much technical expertise is required
- How much management talent is necessary
- What individual traits are important to be successful at this job

Third, to study and understand the *techniques, tools*, and *processes* that are necessary for the success of information systems project management, one must know the following:

- How to manage time
- What software tools are available and how to use them
- How to measure quality
- How to measure performance
- What techniques are available for quality control
- What methods are most useful to the project manager for keeping track of events and activities

This text, therefore, focuses on what information systems project management is, what type of person will make a successful information systems project manager, and

❖ **Figure 1.8** Information Systems Project Management—Overall Book Structure



what helps to be successful. Although these three themes run throughout the text, the chapters are not arranged under three modules. That is because it is important to learn about all three areas concurrently. It is also because it is not always practical or useful to deal with one concept in isolation without referring to the others. Therefore, while some chapters may discuss only one theme, others combine multiple themes.

However, these three aspects of project management are seen in the context of how information systems project management affects the organization as a whole, and especially those stakeholders affected by an information systems project.

This text is also written with a broad spectrum of information systems project managers in mind. In other words, the intent is to make this text valuable to a wide range of information systems professionals and be relevant to management students and information technology students as well as students studying information systems. Thus, the type and coverage of each topic is determined and evaluated with the intent to create a balance between the science and the art of information systems project management. Management issues such as evaluation, planning, and strategy are combined with analytical and software skills such as understanding networks, techniques, and tools such as PERT-CPM, perhaps using Microsoft Project to create an appropriate balance so that individuals with backgrounds in either areas of management or technology are able to benefit from the text. This balance is important since most information systems project management careers require both technical and managerial competencies. However, even if you are not planning a career as an information systems project manager, all those interested in both management and information technology need to know about the issues discussed in this book.

Even if you have no intention to become a project manager in the near future, in work you are very likely, nevertheless, to be a member of a project team, and therefore the interests of the book are still very relevant. Figure 1.8 provides the overall structure of the book.

In Chapter 1 we have introduced the topic of project management and as well as its principles and tools along with information systems, our domain of application. It has introduced many of the concepts and themes that are discussed more fully in the chapters that follow. This chapter also outlined the intent and focus of the text and has set the tone for the remaining chapters. Chapter 2 describes why projects must be aligned with organizational goals and objectives to serve the overall mission. We also show the importance of planning the project and dealing with change management. Chapter 3 provides an overview of the potential of formalized information systems development methodologies (including software aspects) in supporting the work of the project manager. It looks at an approach suitable for larger projects and one suitable for situations in which speed and flexibility are particularly important. Chapters 4 and 5 describe the initial but important stages of information systems project development. They show how to define project scope at the early stage to help development and implementation of a system meeting the project requirements, and how to estimate cost in order to be able to carry out project activities and deliver the final product that delivers the benefits predicted.

Once a project is identified and costs are projected the task of scheduling activities starts. Chapter 6 describes the essentials of project time management and scheduling.

This is an important chapter since it describes how activities depend on one another and how progress is monitored through proper scheduling. Time management tools such as PERT, which assist project managers in monitoring progress, are described. Reliable estimates are essential for setting and controlling activities and schedules. Chapter 7 describes project management leadership and its importance to the success of any project. As we see in Figure 1.8, it is affecting the IS project as a whole. We also discuss the role of team members and provide information about project management careers in this chapter. Chapter 8 describes the project plan and the steps involved in developing a functional and workable plan for the entire project. The PRINCE approach to planning is described.

Chapter 9 describes project team formation. Identifying competent and reliable individuals as team members is an important activity for the project manager. We discuss characteristics of an effective team. Chapter 10 describes how project risks are identified and planned for. It describes the need for contingency planning in the event that changes become necessary or additional resources are required. Continuous monitoring of project activities is a critical function of project management.

Outsourcing and offshoring are now key elements of any decision on project management. Will some of the project be developed by another company, perhaps in another country? This issue is discussed in Chapter 11. Chapter 12 describes standards and quality-control methods that help delivery of the desired outcome. As for chapter 7 on project leadership, the theme of quality has an impact throughout the project's development, and therefore is seen in Figure 1.8 as affecting the whole IS project.

Projects are evaluated from different perspectives: top management, the customer, team members, and the triple constraints of cost, time, and quality of outcome. Chapter 13 shows why measuring project success is important and describes approaches that help an organization evaluate the final product effectively. Chapter 14 describes the final step in the information systems project life cycle—i.e., administrative closure. Formal closure helps tie loose ends and create archive documents for future use.

Each chapter starts with an "exhibit," a piece taken from the views or experience of practitioners that sets the scene for the chapter topic, and ends with a summary, discussion questions, exercises, and a short bibliography for further study. Each chapter has an appendix, which might be a case study, other reading material, or another exhibit for further study, discussion, group work, or class work.

Real-world situations do not always correspond with what is covered in textbooks, so in each chapter we have included a section called "Interview With a Project Manager." Textbooks tend to be comprehensive, covering all aspects of a subject area. Besides, there is always something unique about any situation that makes it different from others. To understand the career of information systems project management better and get a perspective of real-world issues, we conducted numerous interviews with qualified individuals. All these individuals were information systems professionals who either started their career managing IT projects or grew into such a career. Some of these individuals have had formal training in project management, and many learned through practice and experience. Some planned their career toward project management, and some were drawn into it because of demand and company needs. In any case, they all find the experience both challenging and rewarding at the same time.

We will share examples of these interviews here and elsewhere in this text to complement, not replace, the material. We did not plan the study to capture everyone's response to the same questions. We rather asked each respondent a somewhat different set of questions, although the more important questions were repeated. Repeated questions relate to opportunities and challenges, successes and failures, personality traits and skills, and so on. We are indebted to all interviewees and thank them for sharing their insights and experiences with us.

The interview in each chapter does not necessarily directly relate to the material covered in the chapter, but the issues and lessons can be appreciated at that point.

Most of our interview transcripts represent part of an interview with an information systems project manager who learned the career through practice and experience. Our first one, however, is now an owner–manager of a small company, and we wondered whether he thought that his issues were different from that of a project manager in a larger firm.

1.10. Interview With a Project Manager

Tell me about your background.

"I am now owner of a small company of 15 full-time employees and several part-time staff working at home, and we develop niche software products. I am effectively project manager for all projects in the business. Previously I was at a large company as a senior analyst developing software products."

How are the project management concerns different?

"You have no idea. All the books and courses seem to be for large companies. At my previous company we had strategies, plans, and objectives all worked out. We had groups representing user interests. We had formal procedures for justifying and evaluating our projects. It was very bureaucratic. Mind you, we still got it wrong a lot of the time. So they should still learn a lot from you. But in a smaller company like ours there is much less need for a formal procedure, and we cannot afford it in any case.

How can you justify that statement?

"Look, there are relatively few people involved, and I know them all—even people working at home. It is much easier to judge things. Accountability is clear, we know whose fault it is if things go wrong, and in any case everybody involved is working to ensure the success of the project. My staff are much more flexible than the unwieldy project teams I had to deal with before. And in any case, things are usually much simpler."

Well, let me put a few arguments to you. For example, your approach may lead to you overlooking things, or you jump on the first solution, which may not be the best, as you haven't discussed the issues fully.

"There may be some truth in what you say, but we don't have the resources or the time to do what big companies can do. The danger that I see most is a bit different, and that is I basically own the company, and although I think I am a nice man, I am seen as the boss. People don't challenge me as they should even though I ask to be contradicted. Yes, that is a concern and I am not infallible.

Actually when I think about it, I do many of the things a large company does, even if I do it less formally. For example, I make sure our important customers get what they want, and I work out risk factors, costs, and benefits and the rest."

Finally, how do you work out your priorities?

"First I know what our key business needs are, and I start with the most critical. I am interested most in the bottom line, and projects with the highest potential payoff gets the highest priority. Finally, I give priority to those projects that have the lowest risk of failure—at least how I see it!"

1.11. Chapter Summary

The rapid growth of information systems using information technology has created clear opportunities and challenges for today's executives. Increasingly, some middle managers of the past who managed routine tasks and functions are replaced with project managers who are responsible for non-routine, one-time developmental projects within specified time and budget to deliver a system to the satisfaction of the customer. This has caused a significant demand for quality information systems project managers. Information systems project management competency requires a balance of managerial and technical expertise. Successful information systems project managers are able to plan work activities, manage people, communicate with all stakeholders effectively, monitor progress, plan and manage change, deal with the unexpected, understand organizational processes, and so on. They must understand the project development life cycle and have competency in initiating, planning, developing, implementing, and closing a project but also behave ethically throughout. Career opportunities for individuals with such qualifications and traits have never been stronger. All managers and IT professionals, as well as those in information systems, need to be aware of the issues discussed in this book.

DISCUSSION QUESTIONS

1. Project management competency skills include managerial and technical expertise. It has been suggested that technical aspects represent the "science" of project management, and the sociocultural aspect represents the "art" of managing a project. What do you think of this statement?
2. Information systems development has grown over the last couple of decades in terms of volume and complexity. Discuss the role of project management in information systems development and success. How does information systems project management differ from the job of the systems analyst?

3. This chapter defines the information systems project life cycle in terms of initiation, planning, development, implementation, and closure. Discuss how this multiple-stage perspective helps the success of information systems project management.
4. In your opinion, what are the most important individual traits for a successful information systems project manager? What would be your three most important traits? Would the list change from project to project?
5. It may be argued that it is not the individual traits that make a successful project manager but the knowledge of all aspects and the understanding of how they interact and influence each other that matters. Would you agree with this statement and, if so, why?
6. Do you agree with the small firm company director that his project management concerns are totally different from larger companies?
7. Do you think students who cheat (in exams or by copying coursework) are likely to continue this habit in the business domain?

EXERCISES

1. Distinguish between information systems (IS) and information technology (IT).
2. In your own words, describe an information systems project and identify major components and activities for it. What is unique about the project that you have described?
3. What makes an information systems project different from other projects, such as constructing a bridge, planning a conference, planning a holiday, or developing a new degree program? Do you expect skill differences across different projects? If so, list these differences.
4. For an organization that you know (your university, for example) identify the stakeholders of any information systems project (student records, for example). Do you think that the stakeholders were consulted about the project?
5. You are scheduled to interview an information systems project manager. Prepare, for your interview, a list of eight questions that would further enhance what you have learned in this chapter. For example, ask about opportunities and challenges of a project management career or the most important skill based on the experience of the person you will interview.
6. You are scheduled to interview another information systems project manager. This time your assignment is to write a short report that describes a day in the life of an information systems project manager. Try to point out things that are specific to this career that make it different from any other management job.
7. Search the project management literature on the Web and print an article that you find interesting and that relates to the topic in this chapter. Read and prepare a short presentation describing the content of that article.
8. Write an exam question based on the content of this chapter. Ask the person sitting next to you for an answer to your question. Share with the class your question and the response and point out whether you would agree with the response or not and why.

APPENDIX TO CHAPTER 1: CODES OF BEHAVIOR

As we saw in Section 1.8, project managers are expected to behave in an ethical way. Indeed, they are expected to behave in accordance to good standards generally. Many of these standards are obvious and represent good codes of behavior in all walks of life. But some are more specific, related to the role of project management in general or project management of information systems projects more specifically.

The Project Management Institute (PMI) is a professional organization dedicated to the development and promotion of the field of project management. Its Web site is www.pmi.org. Its Member Code of Ethics can be found at www.pmi.org/prod/groups/public/documents/info/ap_memethstandards.pdf, and it attempts to define and clarify the ethical responsibilities for present and future PMI members.

The code begins with this statement: "In the pursuit of the project management profession, it is vital that PMI members conduct their work in an ethical manner in order to earn and maintain the confidence of team members, colleagues, employees, employers, customers/clients, the public, and the global community." It goes on by asking members to pledge to uphold and abide by the following:

- I will maintain high standards of integrity and professional conduct.
- I will accept responsibility for my actions.
- I will continually seek to enhance my professional capabilities.
- I will practice with fairness and honesty.
- I will encourage others in the profession to act in an ethical and professional manner.

There follows sets of member standards of conduct. These are more detailed. We will pick on a few of these for discussion. For example, for professional behavior, it asserts: "PMI Members will fully and accurately disclose any professional or business-related conflicts or potential conflicts of interest in a timely manner." Is it reasonable to expect project managers to disclose all potential conflicts? What happens if the disclosure is against the interest of the company or the department that the person is working?

"PMI Members are asked to refrain from offering or accepting payments [that] may provide unfair advantage for themselves, their business or others they may represent." Is this reasonable if they work for a consulting firm—are they not looking for further work for their business (at the cost of work for other businesses)?

Can you ascertain what happens if the PMI member fails to carry out one or more of the codes?

These guidelines are rather general. Start to add additional pages to this guide, where you provide clauses that give more specifics and examples for project managers. You can add to this as you read further chapters of this book.

Along with professional societies for project managers in general, project managers developing information systems projects might be expected to belong to one of the professional associations related to computing and information systems. The most well known are the Institute of Electrical and Electronics Engineers (IEEE; www.ieee.org), which describes itself as the "the

world's leading professional association for the advancement of technology," and the Association of Computing Machinery (ACM; www.acm.org), "the world's first educational and scientific computing society" in North America; with their equivalents elsewhere, for example, the British Computer Society (BCS; www.bcs.org), "the leading professional body for those working in IT," and the Australian Computer Society (ACS; www.acs.au.org), which describes itself as "the public voice of the ICT profession and the guardian of professional ethics and standards in the ICT industry, with a commitment to the wider community to ensure the beneficial use of ICT."

The IEEE/ACM have a joint code of ethics and professional practice for software engineers who are described as

> those who contribute by direct participation or by teaching, to the analysis, specification, design, development, certification, maintenance and testing of software systems. Because of their roles in developing software systems, software engineers have significant opportunities to do good or cause harm, to enable others to do good or cause harm, or to influence others to do good or cause harm. To ensure, as much as possible, that their efforts will be used for good, software engineers must commit themselves to making software engineering a beneficial and respected profession. In accordance with that commitment, software engineers shall adhere to the following Code of Ethics and Professional Practice.

The code contains eight principles related to the behavior of and decisions made by professional software engineers, including practitioners, educators, managers, supervisors, and policy makers, as well as trainees and students of the profession. The principles identify the ethically responsible relationships in which individuals, groups, and organizations participate and the primary obligations within these relationships. The clauses of each principle are illustrations of some of the obligations included in these relationships. These obligations are founded in the software engineer's humanity, in special care owed to people affected by the work of software engineers, and the unique elements of the practice of software engineering. The code prescribes these as obligations of anyone claiming to be or aspiring to be a software engineer.

Look carefully through the code and address the same questions that we suggested for the PMI code. In your view, does the statement "ethical tensions can best be addressed by thoughtful consideration of fundamental principles, rather than blind reliance on detailed regulations" provide an opt-out to good practice?

The first "public" principle asks that software engineers "accept full responsibility for their own work." What happens if the member was following the orders of his/her manager who required the work to be done in this way, even if that conflicted with the individual's way?

With regard to the second principle on the relationship between the client and employee, the client is asked to provide "service in their areas of competence, being honest and forthright about any limitations of their experience and education." Are all consultants honest in this respect? Would they get work if they were "totally honest"?

On the fourth principle, about product, the engineer is asked to "strive for high quality, acceptable cost and a reasonable schedule, ensuring significant tradeoffs are clear to and accepted by the employer and the client, and are available for consideration by the user and the public." Why is it, then, that so many projects fail in some way?

Regarding Principle 5 "management," we are asked to "ensure good management for any project on which they work, including effective procedures for promotion of quality and reduction of risk" and later to "ensure realistic quantitative estimates of cost, scheduling, personnel, quality and outcomes on any project on which they work or propose to work, and provide an uncertainty assessment of these estimates." Of course, these aspects are fully discussed in this book, amongst other concerns.

Another aspect where this book could be key concerns the requirement that members "further their knowledge of developments in the analysis, specification, design, development, maintenance and testing of software and related documents, together with the management of the development process." Reading this text is a major step in that direction!

The BCS and ACS also suggest codes of professional conduct and practice, but they are meant to apply to any professional involved in developing an information system, so they apply to all the stakeholders listed in Exhibit 1.6. However, there is considerable consistency throughout these professional codes. The professional ethics page of the Association of Information Systems (www.fb.cityu.edu.hk/is/research/ISWorld/ethics) contains advice pertinent to academics in information systems and many links to other Web sites relating to ethical issues.

APPENDIX TO CHAPTER 1: DISCUSSION QUESTIONS

1. Read the appendix and address the questions asked.
2. Regarding the code of ethics provided in the appendix, prepare a short report that outlines your opinion and comments on the subject. Does it make sense to you? Which part of this code do you agree with, and which parts do you question?
3. Search the Web for other examples of codes of conduct relevant to any of the stakeholder types mentioned in Section 1.7. What consistencies and inconsistencies do you see with those for the software engineers described in the appendix?
4. Suggest a code of ethics for students. Are you and your colleagues consistent with your code of ethics?

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