

Introduction

Information technology (IT) projects are receiving great attention in the computer industry because they touch almost everyone's lives. Whether IT projects are managed for business, financial, academia, government, military, or nonprofit organizations, accurate computerized information is needed to make good decisions in less time. However, this computerized information is only as good as the design and management of the IT project systems.

Based on real-world practical experiences and case studies, *IT Project Management Handbook* presents a framework for managing, improving, and building greater accuracy into every phase of IT project management. The successful IT project produces the highest quality products with the fewest number of defects in the shortest, most cost-effective manner that satisfies customer needs. As a primary benefit, *IT Project Management Handbook* provides practical guidelines for managing computer projects—better, faster, and cheaper.

An IT project manager has to make decisions about managing the risks for cost overruns, schedule delays, and failures to meet customer requirements. A successful IT manager takes control of scheduling, budgets, resource allocation, and teamwork with specific strategies to help reach correct decisions. A good manager is an asset in any organization and applies proven project management techniques to avoid common pitfalls at every step of system development. *IT Project Management Handbook* provides the manager with best practices for managing an IT project, thus enabling the reader to evolve into a more effective IT project manager.

IT Project Management Handbook offers practical IT management strategies and well-tested methods and tools for implementing project management techniques. It evaluates recent advances in IT project management techniques, systems development, Internet technology, software repositories, COTS, and system software development technologies. The availability of system software components via the Internet has become one of the most discussed topics among practitioners for reducing costs, maintaining schedules, and producing quality software for successful IT projects. Economically reusing well-tested software components that are suitable to the needs and requirements of the project manager is a key factor presented in this text.

IT Project Management Handbook consists of five sections that discuss the different aspects of the IT project management process. Section I introduces the basics of project management. Chapter 1 explains effective management techniques, objectives, initiations, and characteristics of a good IT project manager, identifying external interfaces, users, customers, and stakeholders.

Chapter 2 provides the guidelines for successful project planning. Planning for an IT project requires the coordination and management of activities, phases, schedules, time lines, and staffing, as well as the delegation of duties and responsibilities. This chapter also discusses the adoption of a reuse approach to system development and maintenance throughout the life cycle of projects.

Chapter 3 discusses correctly estimating costs, defining the appropriate levels of efforts, WBS, scheduling, staffing, milestones, budgeting, and IT system development and maintenance phases. COCOMO predicts the effort and duration of a project. The *function points* method measures the system's development productivity. An *earned value* tool keeps a record of tasks and activities. The *Gantt chart* shows activities, their duration, and their interrelationships. The *PERT chart* identifies the relationship of many steps involved in complex systems. A *CPM tool* is designed to reduce the length of a project.

Chapter 4 introduces quality control mechanisms for IT project management. Establishing a system for developing efficient practices will monitor these practices throughout the life cycle of the project. IT project

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managers establish the QAS to control established quality principles, and they insist that quality is the responsibility of all who are involved in the system development, and not simply the responsibility of those in the quality assurance section.

Section II presents industry best practice standards. IT project managers establish the processes necessary to identify, monitor, and manage risks. Chapter 5 discusses managing IT project risk, which is often the result of unpredictable losses that can occur anytime and anywhere during the project's life cycle. Risk is associated with all aspects of the project—requirements, architecture, design, implementation, team members, management, and WBS.

Chapter 6 discusses commercial best–practice standards. Most system developers design their own standards and follow them in their organizations. This chapter studies IEEE standards for system development and management, ISO standards, and guidelines to tailor standards.

Chapter 7 explains the importance of system measurement techniques, methods, and tools. Measurement is a key element in the successful management of IT projects in every established engineering discipline. The purpose of this chapter is to provide project managers with the systems information that is needed to monitor and correct project progress, activities, costs, schedules, and technical objectives.

Chapter 8 discusses commercial items (CI). CIs consist of automated software tools for managing IT projects. CI tools also include COTS and NDI. The CI is not a replacement for any method of the system management; rather, it is a supplement for the methods and enhances the probability for generating quality products.

Section III introduces the latest technology for IT project management. Chapter 9 discusses the customer. The quality of the management of an IT system is determined not only by the absence of system defects but also by customer satisfaction. The customer is an important factor in the growth of every organization, and customer satisfaction plays a vital role in building an organization's reputation and progress. This chapter offers proven strategies to IT managers to ensure the building of long–term customer relationships.

Chapter 10 explains the basics of network management. Currently, IT project management requires networking to ensure that data and information are electronically accessed at a distance.

Chapter 11 discusses Internet applications and e–commerce. Since the existence of the Internet, the World Wide Web has evolved to the point that wireless technology now allows individuals to 'surf' the web.

Chapter 12 discusses distributed object technology, which provides the mechanisms for linking objects in a network. With distributed objects, users concentrate more on what is needed, not how to get it. This chapter also discusses environments and CORBA.

Chapter 13 presents a practical case study using distributed object technology. The discussion surrounding the case study focuses on three–tier client–server environments, service objects, service–object replication, partitioning, load balancing, and failover.

Chapter 14 discusses a wireless practical case study and building wireless components.

Section IV presents the requirements for building the foundations of IT systems. Failure to understand the requirements in the beginning may result in an inefficient system and delays in product delivery.

Chapter 15 discusses system requirements, which basically consist of hardware, software, and operational requirements. IT project managers establish processes that identify, elicit, and understand system requirements.

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Chapter 16 introduces managing system requirement processes, tools, and activities that span the life cycle of an IT system. These activities relate to requirement changes and implementation during system development and maintenance.

Chapter 17 discusses system design process. IT project managers establish system design process, and the system designer develops the system architecture to understand the requirements. System design begins with the baseline of system requirements. System requirements are partitioned between software and hardware requirements.

Chapter 18 discusses software requirement analysis, which is a process of understanding the requirements of the technical practitioners. IT project managers select the methods for software requirement analysis. This chapter discusses software development planning, various modeling techniques, and software requirement analysis.

Chapter 19 studies software design. The software design process translates requirement specifications from the 'what' phase of software development to the 'how' phase. This chapter covers software design architectures, software design methods, object-oriented design methods, structured design methods, and software design descriptions.

Chapter 20 discusses the software implementation process, which includes writing source code, executing code, and testing code for each item in the design phase, as well as integrating software units and software components into software items. This chapter also discusses testing software units and components to ensure satisfaction of requirements.

Section V includes IT project completion and evaluation. An effective IT manager successfully completes an IT project within budget and schedule. Chapter 21 discusses system integration and the evaluation process of combining hardware configuration items with software configuration items, as well as other systems as necessary, into the IT system. This chapter also discusses the verification of system requirements, validation, documentation, customer acceptance testing, future trends, and guideline suggestions.

Chapter 22 presents a practical case study from start to finish.

Acronyms used in this book are defined and references are provided at the end of the book.

The information and data contained in this book have been compiled from various sources and are intended to be used for reference purposes. Neither the publisher nor the authors guarantee the accuracy of the information and data.

Chapter 1: Information Technology Project Initiation

Information technology (IT) projects receive attention in the computer industry because they influence almost everyone. Whether the IT project manager is managing projects for business, financial, academic, government, military, or nonprofit organizations, he or she needs accurate computerized information to make decisions in a short amount of time. This computerized information is as good as the design and management of the IT project systems.

Effective IT Project Management Techniques

A modern IT project manager's task is threefold: to supervise IT computer professionals, understand state-of-the-art techniques, and make the IT project successful. The manager should enhance his or her ability to understand project management techniques, modern technologies, and system development methods and tools. A manager cannot effectively manage a technical team unless he or she understands the basics of what the team members are doing and the technical aspects of the organization. In this way, he or she increases the efficiency of the operation, maintains a positive environment, and reduces turnover.

A good IT project manager is hard to find. A manager must be able to handle his or her team well to deliver a quality product within the defined budget and schedule. A manager who is well versed in the state-of-the-art techniques can analyze the user's requirements, design the IT system, develop the software, and deliver the finished product to the satisfaction of the users.

A good manager must recognize what tools are required and use them in a knowledgeable manner to plan, estimate, schedule, and develop the IT project's complete work breakdown structure (WBS) without guesswork or reliance upon another individual's memory or experience. The manager is a leader who increases interpersonal relationships with his or her group, communicates effectively, and guides with the vision necessary to lead them to success. He or she is practical in making decisions and recognizes the importance of objectivity, vision, and initiative in arriving at sound, quality decisions.

A good manager also identifies and develops talent in others. He or she arranges special IT technical training to foster individual growth and efficiently manages time and resources through the delegation of tasks to those who are the most suitable. The manager is constantly assessing skills in others and escalating responsibilities accordingly. He or she gives due respect, promotions, and raises to maintain high morale of team members.

The manager selects the methodology and techniques that are the most suitable for development of the IT system. He or she staffs the project in phases as needed and provides the necessary technical training to bring himself or herself and the team up to standard. The manager understands users' acceptance criteria of the system products. He or she stresses that the team members should develop a prototype model and simulate the system to aid in understanding the users' requirements for the development and maintenance of the system. The manager encourages the users to examine cases at the completion of the project to confirm that the users' requirements are testable. The manager appoints other supporting personnel as shown in Box 1–1. Figure 1–1 graphically presents this system of support personnel and various phases

Box 1–1: List of Support Personnel

- Technical training consultant
- System engineers and analysts
- System testers