Chapter 1:
Introduction to Project Management

Information Technology Project Management, Seventh Edition

Note: See the text itself for full citations.

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Learning Objectives

▸ Understand the growing need for better project management, especially for information technology (IT) projects

▸ Explain what a project is, provide examples of IT projects, list various attributes of projects, and describe the triple constraint of project management

▸ Describe project management and discuss key elements of the project management framework, including project stakeholders, the project management knowledge areas, common tools and techniques, and project success

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Learning Objectives

▸ Discuss the relationship between project, program, and portfolio management and the contributions each makes to enterprise success

▸ Understand the role of project managers by describing what they do, what skills they need, and career opportunities for IT project managers

▸ Describe the project management profession, including its history, the role of professional organizations like the Project Management Institute (PMI), the importance of certification and ethics, and the advancement of project management software
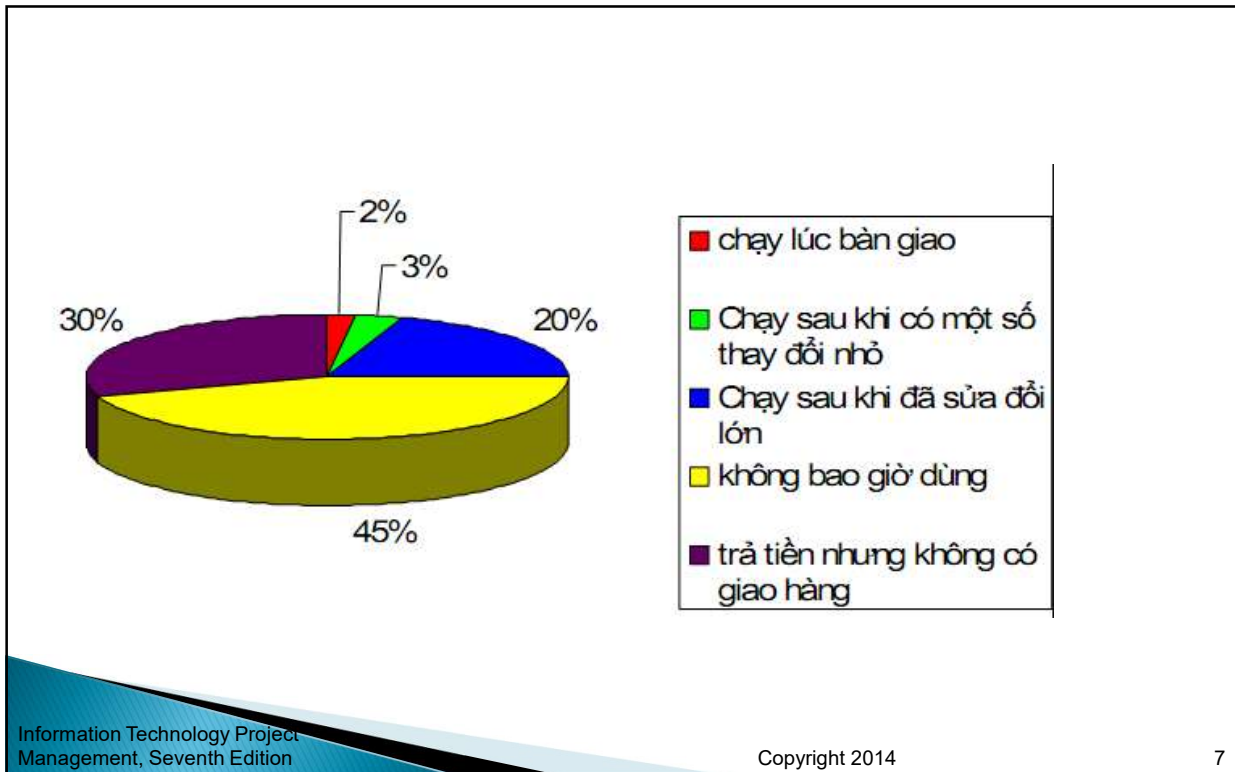
Introduction

▸ Many organizations today have a new or renewed interest in project management

▸ Computer hardware, software, networks, and the use of interdisciplinary and global work teams have radically changed the work environment

▸ The world as a whole spends nearly $10 trillion of its $40.7 trillion gross product on projects of all kinds

▸ More than 16 million people regard project management as their profession
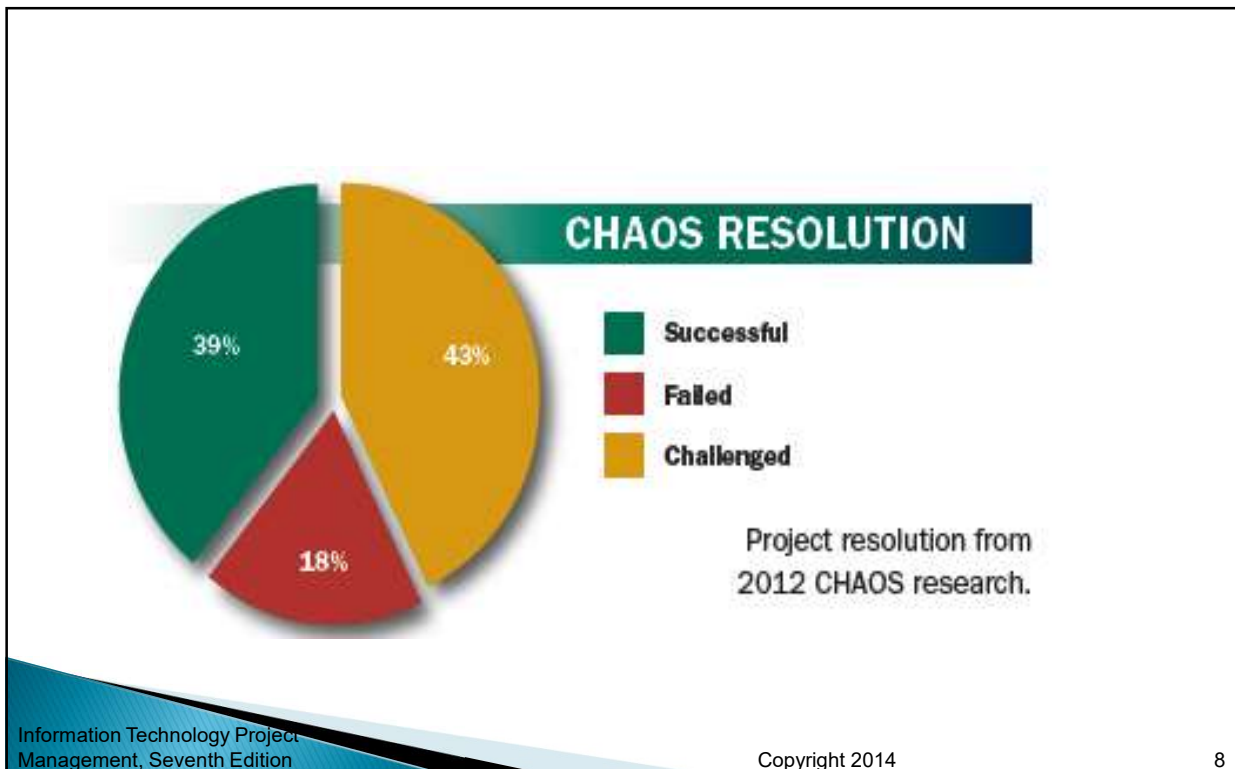
Project Management Statistics

▸ The overall information and communications technology market grew by 6 percent to almost $3 trillion in 2010

▸ In the U.S. the size of the IT workforce topped 4 million workers in 2008, and the unemployment rate for IT professionals is half the rate for the overall labor market

▸ In 2011 the total compensation for the average senior project manager in U.S. dollars was $105,000 per year in the United States and $160,409 in the Switzerland.

▸ The number of people earning their Project Management Professional (PMP) certification continues to increase. 44 percent of employers listed project management as a skill they looked for in new college grads, behind only communication and technical skills

Motivation for Studying Information Technology (IT) Project Management

▸ IT Projects have a terrible track record, as described in the What Went Wrong?

▸ A 1995 Standish Group study (CHAOS) found that only 16.2% of IT projects were successful in meeting scope, time, and cost goals; over 31% of IT projects were canceled before completion

▸ A PricewaterhouseCoopers study found that overall half of all projects fail and only 2.5% of corporations consistently meet their targets for scope, time, and cost goals for all types of project.

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Advantages of Using Formal Project Management

- Better control of financial, physical, and human resources
- Improved customer relations
- Shorter development times
- Lower costs
- Higher quality and increased reliability
- Higher profit margins
- Improved productivity
- Better internal coordination
- Higher worker morale

What Is a Project?

- A **project** is "a temporary endeavor undertaken to create a unique product, service, or result" (PMBOK® Guide, Fifth Edition, 2012)

- Operations is work done to sustain the business

- Projects end when their objectives have been reached or the project has been terminated

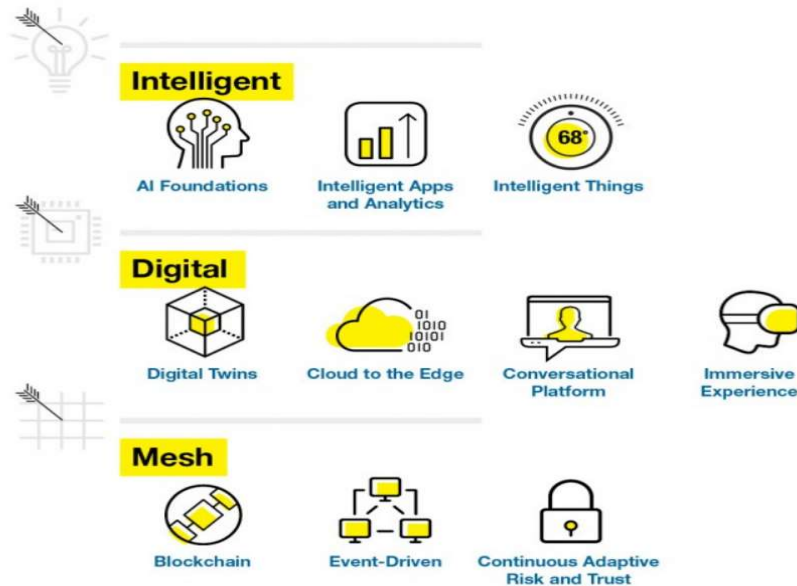- Projects can be large or small and take a short or long time to complete

Examples of IT Projects

- A team of students creates a smartphone application and sells it online
- A company develops a driverless car
- A small software development team adds a new feature to an internal software application for the finance department
- A college upgrades its technology infrastructure to provide wireless Internet access across the whole campus

Top Strategic Technologies for 2012 (Gartner)

- Media tablets and beyond
- Mobile-centric applications and interfaces
- Contextual and social user experience
- Internet of things
- Cloud computing

Top Strategic Technologies for 2018 (Gartner)

Intelligent
- AI Foundations
- Intelligent Apps and Analytics
- Intelligent Things

Digital
- Digital Twins
- Cloud to the Edge
- Conversational Platform
- Immersive Experience

Mesh
- Blockchain
- Event-Driven
- Continuous Adaptive Risk and Trust

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Top Strategic Technologies for 2019 (Gartner)

Intelligent	Digital	Mesh
Autonomous Things	Digital Twin	Blockchain
Augmented Analytics	Empowered Edge	Smart Spaces
AI-Driven Development	Immersive Experience	

Privacy and Ethics
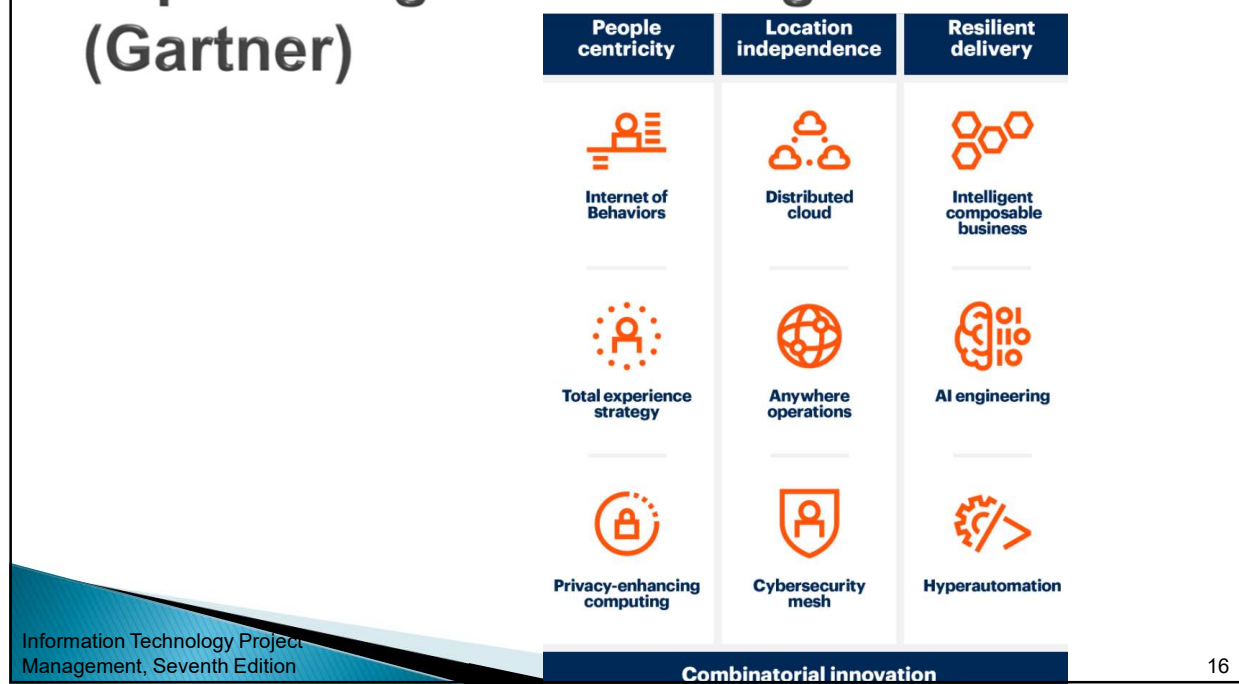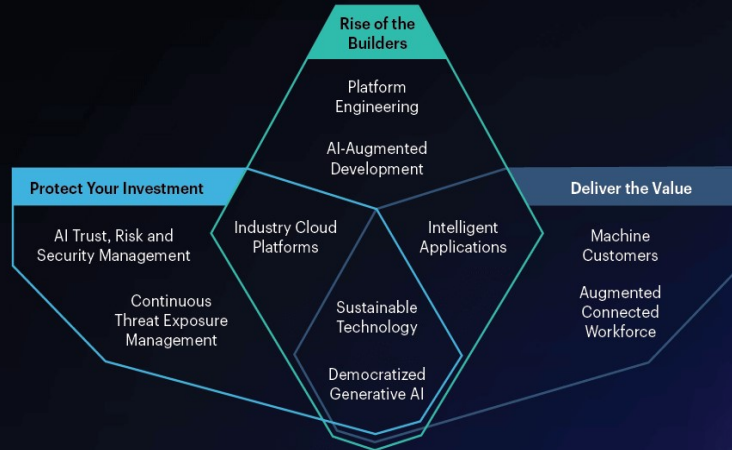
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Top Strategic Technologies for 2020 (Gartner)

Top Strategic Technologies for 2021 (Gartner)

Top Strategic Technologies for 2022 (Gartner)

Top Strategic Technologies for 2023 (Gartner)

Media Snapshot: Unproductive Apps

- Gartner predicts that by 2014, there will be more than 70 billion mobile application downloads every year
- All of the top iPhone apps in early 2012 (Temple Run, Angry Gran, Zombie Farm, Words With Friends, Angry Birds, etc.) and most of the top iPad2 apps can be considered unproductive in most work environments
- *The challenge is to develop useful apps and get workers to focus on them instead of the many distracting options available*

Project Attributes

- A project
  - has a unique purpose
  - is temporary – has beginning and an end
  - is developed using progressive elaboration
  - requires resources, often from various areas
  - should have a primary customer or sponsor
    - The **project sponsor** usually provides the direction and funding for the project
  - involves uncertainty

Project and Program Managers

- **Project managers** work with project sponsors, project team, and other people involved in a project to meet project goals

- **Program**: group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually (PMBOK® Guide, Fifth Edition, 2012)

- Program managers oversee programs; often act as bosses for project managers

Figure 1-1 The Triple Constraint of Project Management

Successful project management means meeting all three goals (scope, time, and cost)—and satisfying the project's sponsor!

Target

Scope goal

Cost goal

Time goal

What is Project Management?

‣ **Project management** is "the application of knowledge, skills, tools and techniques to project activities to meet project requirements" (PMBOK® Guide, Fourth Edition, 2012)

‣ Project managers strive to meet the **triple constraint** by *balancing* project scope, time, and cost goals

‣ Project managers facilitate the entire process to meet the needs and expectations of project stakeholders

Figure 1-2 Project Management Framework

Project Stakeholders?

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Project Stakeholders

▸ **Stakeholders** are the people involved in or affected by project activities
▸ Stakeholders include
  ◦ the project sponsor
  ◦ the project manager
  ◦ the project team
  ◦ support staff
  ◦ customers
  ◦ users
  ◦ suppliers
  ◦ opponents to the project
  ◦ Also, may include the community and tax payers

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10 Project Management Knowledge Areas

- **Knowledge areas** describe the key competencies that project managers must develop
- Project managers must have knowledge and skills in all 10 knowledge areas (project integration, scope, time, cost, quality, human resource, communications, risk, procurement, and stakeholder management)
- This text includes an entire chapter on each knowledge area

10 Project Management Knowledge Areas

Knowledge Area/Category	Tools and Techniques
Integration management	Project selection methods, project management methodologies, stakeholder analyses, work requests, project charters, project management plans, project management software, change requests, change control boards, project review meetings, lessons-learned reports
Scope management	Scope statements, work breakdown structures, statements of work, requirements analyses, scope management plans, scope verification techniques, scope change controls
Time management	Gantt charts, project network diagrams, critical path analysis, crashing, fast tracking, schedule performance measurements
Cost management	Project budgets, net present value, return on investment, payback analysis, earned value management, project portfolio management, cost estimates, cost management plans, cost baselines

10 Project Management Knowledge Areas

Quality management	Quality metrics, checklists, quality control charts, Pareto diagrams, fishbone diagrams, maturity models, statistical methods, test plans
Human resource management	Motivation techniques, empathic listening, responsibility assignment matrices, project organizational charts, resource histograms, team building exercises
Communications management	Communications management plans, kick-off meetings, conflict management, communications media selection, status and progress reports, virtual communications, templates, project Web sites
Risk management	Risk management plans, risk registers, probability/impact matrices, risk rankings
Procurement management	Make-or-buy analyses, contracts, requests for proposals or quotes, source selections, supplier evaluation matrices

Project Management Tools and Techniques

▸ **Project management tools and techniques** assist project managers and their teams in various aspects of project management
▸ Some specific ones include
  ◦ Project charter, scope statement, and WBS (scope)
  ◦ Gantt charts, network diagrams, critical path analysis, critical chain scheduling (time)
  ◦ Cost estimates and earned value management (cost)
  ◦ See Table 1-1 for many more

Super Tools

- "**Super tools**" are those tools that have high use and high potential for improving project success, such as:
  - Software for task scheduling (such as project management software)
  - Scope statements
  - Requirements analyses
  - Lessons-learned reports
- Tools already extensively used that have been found to improve project importance include:
  - Progress reports
  - Kick-off meetings
  - Gantt charts
  - Change requests

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What Went Right? Improved Project Performance

The Standish Group's CHAOS studies show improvements in IT projects in the past decade:

- The number of successful IT projects has more than doubled, from 16 percent in 1994 to 37 percent in 2010
- The number of failed projects decreased from 31 percent in 1994 to 21 percent in 2010
- Success rates were the highest ever in the most recent CHAOS study

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Why the Improvements?

"The reasons for the increase in successful projects vary. First, the average cost of a project has been more than cut in half. Better tools have been created to monitor and control progress and **better skilled project managers with better management processes** are being used. The fact that there are processes is significant in itself."*

Standish Group. "CHAOS 2001: A Recipe for Success" (2001).

Project Success

▸ There are several ways to define project success:
  ◦ The project met scope, time, and cost goals
  ◦ The project satisfied the customer/sponsor
  ◦ The results of the project met its main objective, such as making or saving a certain amount of money, providing a good return on investment, or simply making the sponsors happy

Table 1-2: What Helps Projects Succeed?*

1. User involvement
2. Executive support
3. Clear business objectives
4. Emotional maturity
5. Optimizing scope
6. Agile process
7. Project management expertise
8. Skilled resources
9. Execution
10. Tools and infrastructure

*The Standish Group, "CHAOS Activity News" (August 2011).

Top Three Reasons Why Federal Technology Project Succeed

▸ Adequate funding
▸ Staff expertise
▸ Engagement from all stakeholders

What the Winners Do…

▸ Recent research findings show that companies that excel in project delivery capability:

  ◦ Use an integrated project management toolbox (use standard/advanced PM tools, lots of templates)

  ◦ Grow project leaders, emphasizing business and soft skills

  ◦ Develop a streamlined project delivery process

  ◦ Measure project health using metrics, like customer satisfaction or return on investment

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Program and Project Portfolio Management

▸ A **program** is "a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually" (PMBOK® Guide, Fifth Edition, 2012)

▸ A **program manager** provides leadership and direction for the project managers heading the projects within the program

▸ Examples of common programs in the IT field include infrastructure, applications development, and user support

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Program in IT field

- *Infrastructure:* An IT department often has a program for IT infrastructure projects. This program could encompass several projects, such as providing more wireless Internet access, upgrading hardware and software, and developing and maintaining corporate standards for IT.
- *Applications development:* This program could include several projects, such as updating an enterprise resource planning (ERP) system, purchasing a new off-the-shelf billing system, or developing a new capability for a customer relationship management system.
- *User support:* In addition to the many operational tasks related to user support, many IT departments have several projects to support users. For example, a project might provide a better e-mail system or develop technical training for users.

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Project Portfolio Management

▸ As part of **project portfolio management**, organizations group and manage projects and programs as a portfolio of investments that contribute to the entire enterprise's success

▸ Portfolio managers help their organizations make wise investment decisions by helping to select and analyze projects from a strategic perspective

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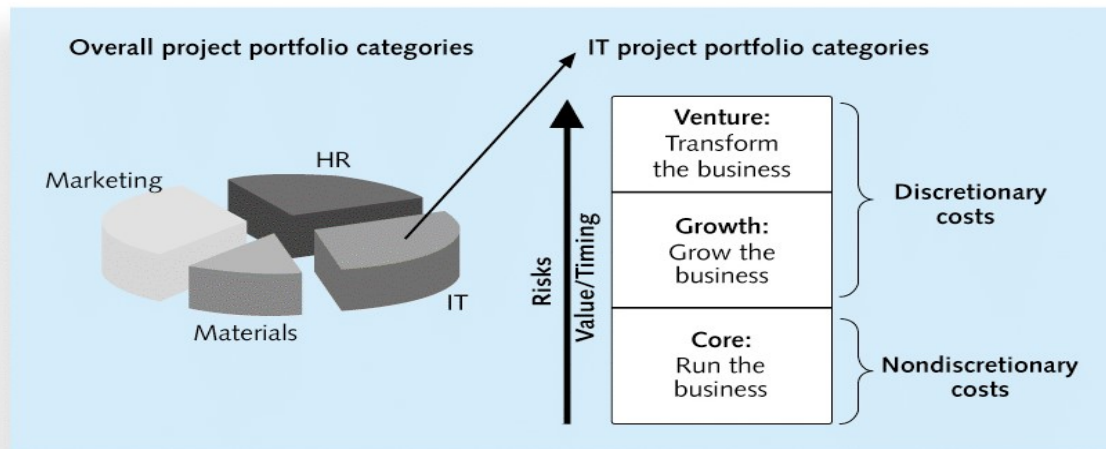# Figure 1-3. *Project Management Compared to Project Portfolio Management*

Project portfolio management
- Are we working on the right projects?
- Are we investing in the right areas?
- Do we have the right resources to be competitive?

Strategic goals

Project management
- Are we carrying out projects well?
- Are projects on time and on budget?
- Do project stakeholders know what they should be doing?
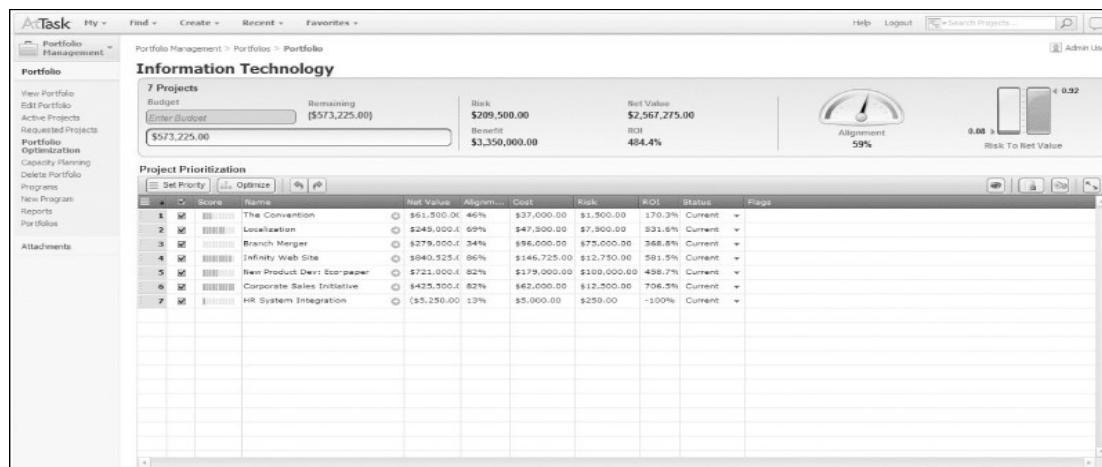
Tactical goals

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Best Practice

▸ A **best practice** is "an optimal way recognized by industry to achieve a stated goal or objective"*

▸ Robert Butrick *suggests that organizations* need to follow basic principles of project management, including these two mentioned earlier in this chapter:
- ◦ Make sure your projects are driven by your strategy. Be able to demonstrate how each project you undertake fits your business strategy, and screen out unwanted projects as soon as possible
- ◦ Engage your stakeholders. Ignoring stakeholders often leads to project failure. Be sure to engage stakeholders at all stages of a project, and encourage teamwork and commitment at all times

*Project Management Institute, *Organizational Project Management Maturity Model (OPM3) Knowledge Foundation (2003), p. 13.*

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Figure 1-4. Sample Project Portfolio Approach

Figure 1-5. Sample Project Portfolio Management Screen Showing Portfolio Optimization

The Role of the Project Manager

- Job descriptions vary, but most include responsibilities like planning, scheduling, coordinating, and working with people to achieve project goals

- Remember that 97% of successful projects were led by experienced project managers, who can often help influence success factors

Project manager's Skills?

Suggested Skills for Project Managers

- The Project Management Body of Knowledge
- Application area knowledge, standards, and regulations
- Project environment knowledge
- General management knowledge and skills
- Soft skills or human relations skills

Table 1-3 Ten Most Important Skills and Competencies for Project Managers

1. People skills
2. Leadership
3. Listening
4. Integrity, ethical behavior, consistent
5. Strong at building trust
6. Verbal communication
7. Strong at building teams
8. Conflict resolution, conflict management
9. Critical thinking, problem solving
10. Understands, balances priorities

Different Skills Needed in Different Situations

- **Large projects**: Leadership, relevant prior experience, planning, people skills, verbal communication, and team-building skills were most important
- **High uncertainty projects**: Risk management, expectation management, leadership, people skills, and planning skills were most important
- **Very novel projects**: Leadership, people skills, having vision and goals, self confidence, expectations management, and listening skills were most important

Importance of Leadership Skills

- Effective project managers provide leadership by example

- A **leader** focuses on long-term goals and big-picture objectives while inspiring people to reach those goals

- A **manager** deals with the day-to-day details of meeting specific goals

- Project managers often take on the role of both leader and manager

Careers for IT Project Managers

- In a 2011 survey, IT executives listed the "nine hottest skills" they planned to hire for in 2012
- Project management was second only to programming and application development

Table 1-4. Nine Hottest Skills*

Skill	Percentage of Respondents
Programming and application development	60%
Project management	44%
Help desk/technical support	35%
Networking	35%
Business intelligence	23%
Data center	18%
Web 2.0	18%
Security	17%
Telecommunications	9%

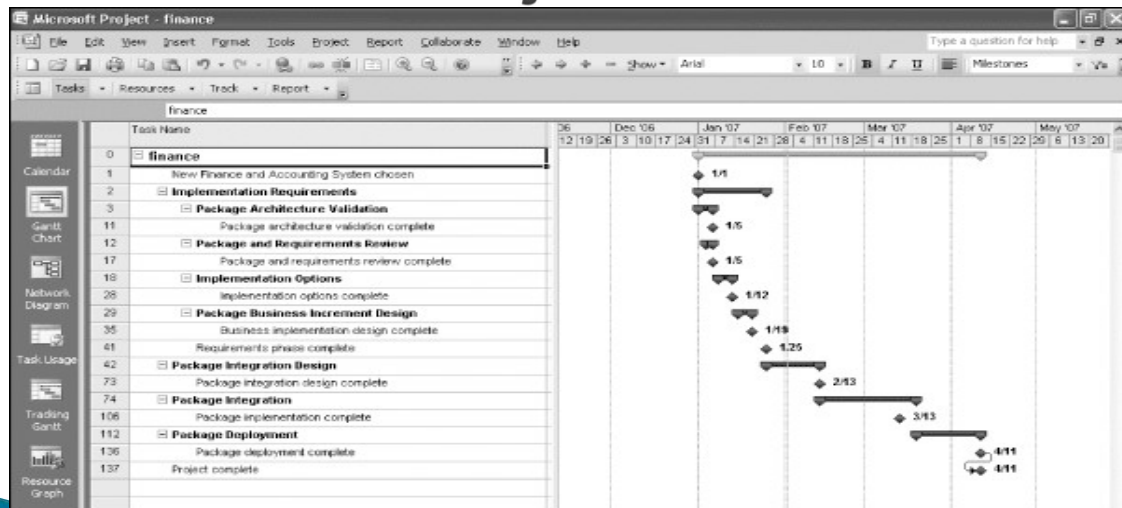*Source: Rick Saia, "9 Hot IT Skills for 2012," Computerworld, September 26, 2011.

The Project Management Profession

▸ The profession of project management is growing at a very rapid pace

▸ It is helpful to understand the history of the field, the role of professional societies like the Project Management Institute, and the growth in project management software

History of Project Management

▸ Some people argue that building the Egyptian pyramids was a project, as was building the Great Wall of China

▸ Most people consider the *Manhattan Project* to be the first project to use "modern" project management

▸ This three-year, $2 billion (in 1946 dollars) project had a separate project manager and a technical manager
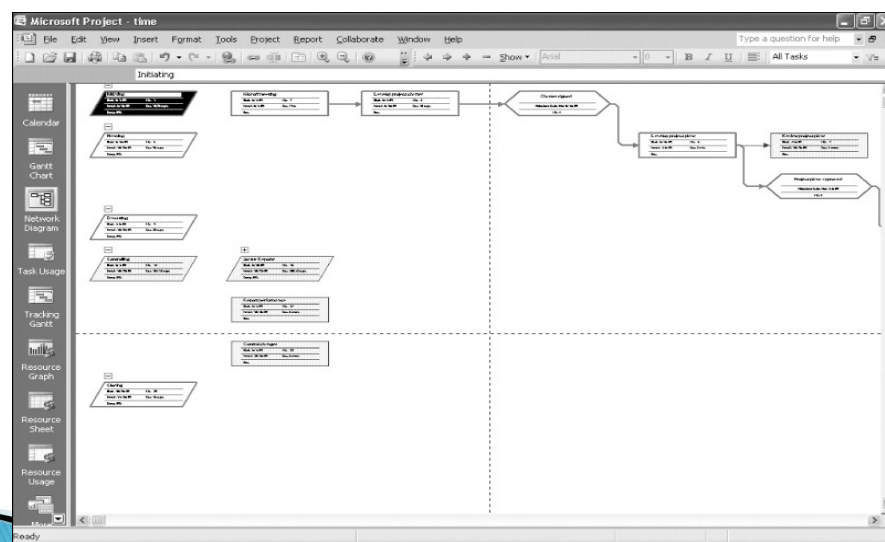
Figure 1-6. Sample Gantt Chart Created with Project 2010
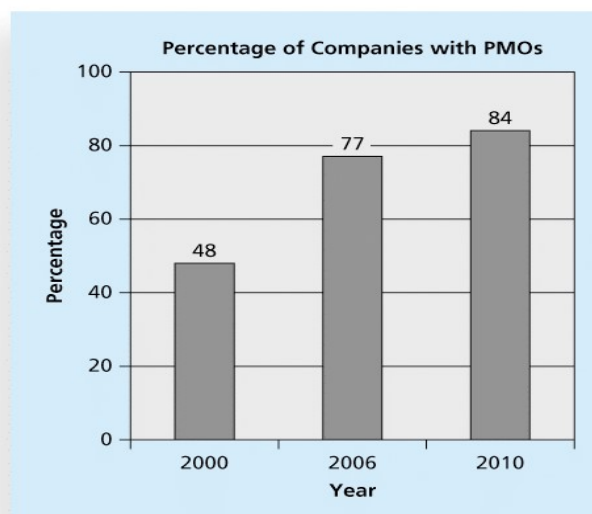
Figure 1-7. Sample Network Diagram Created with Project 2010

Project Management Offices

▸ In the 100s, many companies began creating PMOs to help them handle the increasing number and complexity of projects

▸ A **Project Management Office (PMO)** is an organizational group responsible for coordinating the project management function throughout an organization

Figure 1-8. Growth in the Number of Project Management Offices

Percentage of Companies with PMOs

Global Issues

▸ Several global dynamics are forcing organizations to rethink their practices:

  ◦ Talent development for project and program managers is a top concern
  ◦ Good project portfolio management is crucial in tight economic conditions
  ◦ Basic project management techniques are core competencies
  ◦ Organizations want to use more agile approaches to project management
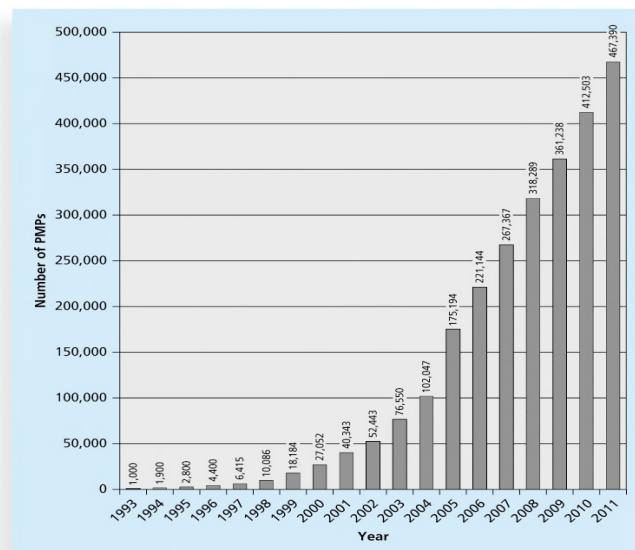 ◦ Benefits realization of projects is a key metric

The Project Management Institute

▸ The Project Management Institute (PMI) is an international professional society for project managers founded in 1969

▸ PMI has continued to attract and retain members, reporting more than 380,000 members worldwide by 2012

▸ There are communities of practices in many areas, like information systems, financial services, and health care

▸ Project management research and certification programs continue to grow

▸ Students can join PMI at a reduced fee and earn the Certified Associate in Project Management (CAPM) certification(see www.pmi.org for details)

Project Management Certification

- PMI provides certification as a **Project Management Professional** (**PMP**)
- A PMP has documented sufficient project experience, agreed to follow a code of ethics, and passed the PMP exam
- The number of people earning PMP certification is increasing quickly
- PMI and other organizations offer additional certification programs (see Appendix B)

Figure 1-9 Growth in PMP Certification, 1993-2011

Ethics in Project Management

- **Ethics**, loosely defined, is a set of principles that guide our decision making based on personal values of what is "right" and "wrong"

- Project managers often face ethical dilemmas

- In order to earn PMP certification, applicants must agree to PMI's Code of Ethics and Professional Conduct

- Several questions on the PMP exam are related to professional responsibility, including ethics

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Project Management Software

- There are hundreds of different products to assist in performing project management
- Three main categories of tools:
  - Low-end tools: Handle single or smaller projects well, cost under $200 per user
  - Midrange tools: Handle multiple projects and users, cost $200-$1,000 per user, Project 2010 most popular
  - High-end tools: Also called enterprise project management software, often licensed on a per-user basis, like Microsoft Enterprise Project Management solution

Chapter Summary

- A project is a temporary endeavor undertaken to create a unique product, service, or result
- Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements
- A program is a group of related projects managed in a coordinated way
- Project portfolio management involves organizing and managing projects and programs as a portfolio of investments
- Project managers play a key role in helping projects and organizations succeed
- The project management profession continues to grow and mature

Q&A

▸ **Project** : tạo ra sản phẩm, dịch vụ hay kết quả mang tính **duy nhất** (Unique). Dự án phải có thời gian bắt đầu và thời gian kết thúc nghĩa là mang tính **tạm thời** (temporary). Tránh nhầm lẫn dự án với công việc điều hành hàng ngày (operation work) luôn mang tính lặp lại.

▸ **Program**: là một nhóm project có mối liên quan với nhau (Projects are related).

▸ <mark>**Portfolio**: là một nhóm programs nhằm đạt được mục tiêu chiến lược của doanh nghiệp.</mark>

▸ **Constrain**: là sự ràng buộc các yếu tố trong dự án như thời gian, chi phí, rủi ro, phạm vi công việc, tài nguyên,… thường thì các yếu tố này là giới hạn, người quản trị dự án phải tối ưu các yếu tố để đạt được kết quả tốt nhất.

- **Stakeholder**: những người có quyền lợi, những người bị (hoặc được) ảnh hưởng bởi dự án. Họ là Project manager, người tài trợ, khách hàng, chính phủ, cộng đồng dân cư,… nói chung là những người liên quan đến dự án.
- **Organization Structure**: mô hình của tổ chức, một tổ chức thường có 3 kiểu: một là **Funtional** – tổ chức theo các phòng ban chức năng, hai là **Projectized** – tổ chức theo dự án, ba là **Matrix** – tổ chức theo ma trận.

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- **Project Experditor**: nhân viên hỗ trợ quản trị dự án nhưng không có quyền đưa ra các quyết định
- **Project Cordinator**: như Project Experditor nhưng có một số quyền hạn và báo cáo lên cấp trên.
- **Product Life Cycle**: là vòng đời sản phẩm từ mức ý tưởng đến lúc kết thúc (Conception, Growth, Maturity, Decline, Withdrawal). Một sản phẩm có thể có rất nhiều dự án trong vòng đời của nó.

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‣ **Project Life Cycle**: là những việc bạn cần làm để hoàn tất công việc dự án. Có sự khác nhau về Project life cycle, tuỳ thuộc vào ngành nghề. Ví dụ: **ngành xây dựng gồm:** Feasibility, Planning, design, production, turnover, and startup. **Ngành Công nghệ thông tin gồm**: High-level design, detailed design, coding, testing, installation, conversion, and turnover to operation.

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‣ **Project Management Process**: gồm Initiating (khởi động), Planning (hoạch định), Executing (thực hiện), Monitoring & Controlling (theo dõi và điều chỉnh), and Closing (kết thúc).

‣ **Lessons Learned:** bài học kinh nghiệm, là tài liệu mô tả những gì đã làm tốt, những gì làm chưa tốt và giả sử dự án được làm lại thì bạn sẽ làm thế nào ?

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▸ **Progressive Elaboration**: quá trình liên tục tinh chỉnh dự toán và phạm vi gọi là Progressive Elaboration. Tinh chỉnh có nghĩa là làm cho dự toán và phạm vi ngày càng chính xác và chi tiết, việc tinh chỉnh được thực hiiện từ lúc khởi động (initiating), hoạch định (planning), thực thi (executing) đến theo dõi và điều chỉnh (Monitoring & Controling).

▸ **Project Charter**: là một trong những tài liệu khởi động dự án, một **Project Charter**thường bao gồm Project Title and Description, Project Manager Assigned and Authority Level, Business Case, Resources Preassigned, Stakeholders, Stakeholder Requirements As Know, Product Description/Deliverables, Measurable Project Objectives, Project Approval Requirement, High-Level Project Risks, Project Sponsor Authorizing.