

**Methods of IT
Project Management**

Jeffrey L. Brewer | Kevin C. Dittman

Chapter 1

Introduction to Project Management

1-1

Objectives

- Define what a *project is and is not*
- Define *project management*
- Understand the **skills** necessary to lead projects
- Understand the **organizational structures** where projects exist

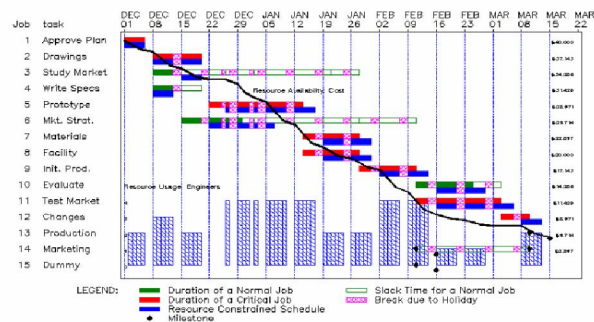
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Project

1-3

What Is a Project?

- **A temporary sequence of related activities (tasks) that must be completed to create a unique product or service**
- **Key Characteristics:**
 - **Temporary** (it has a beginning and an end; with achieving a goal or not)
 - **Unique** (revolutionary, with uncertainty and risks) or evolutionary
 - **Progressive (quantifiable) Elaboration** (steps, phases, increments)
 - **Single unique purpose or goal** (however, in general, any project may have several goals)
- **Secondary Characteristics:**
 - Each project must have a **primary sponsor or champion**
 - Projects usually **cut across organizational lines** requiring resources from several different sources
 - Projects **must do something**, deliver something of value



Software Development Projects

Key factors that influence the software project's outcomes (end results):

1. Project **size** (funding, outcomes, etc.)
2. Delivery **deadline** (project duration and timetable)
3. **Budgets** and costs
4. Application **domain** (high tech areas, low-tech areas, etc.)
5. **Technology** to be implemented (high tech or low-tech)
6. System **constraints**
7. User **requirements** (graphic user interface, usability, etc.)
8. Available **resources** (human, technical, experts, communication, organizational, buildings, labs, etc.)

All those factors have significant impact on project organizational structure

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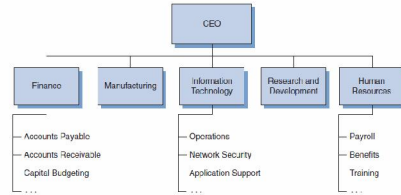
Project Organizational Structures

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Organizational Structures

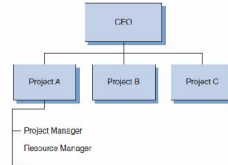
Functional (traditional)

Organized around one of these characteristics or business functions: job function, end product, customer groups, a specific process, or geographic locations



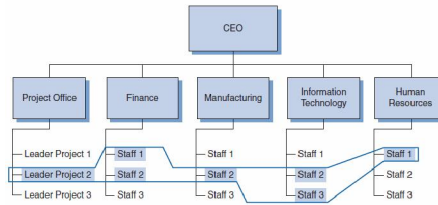
Project-based

Organized completely around projects and sometimes its mere existence is only for one particular project (the Olympic games for example)

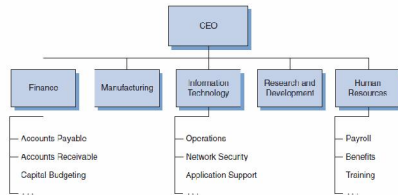


Matrix (Weak, Balanced, Strong)

Combination of traditional and project



Functional (Traditional) Structure of an Organization

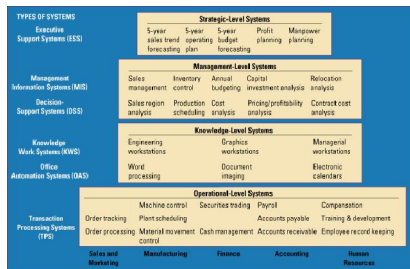


Benefits (advantages)

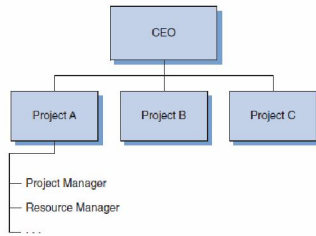
- Individuals can specialize and become very proficient in one area
- Communication channels are well established
- Good control over resources since they only have one boss
- Easier budgeting and cost control because all budgets differentiated by defined department boundaries
- Traditional advancement within the functional department

Disadvantages (drawbacks):

- Project Manager holds the least amount of authority
- Potential underutilization of resources or misallocation of resources
- Economies of scale when sharing resources (people and materials) across projects
- Individual exposure outside of one's department limited
- Focus not always on the project



Project-Based Organizational Structure



Benefits:

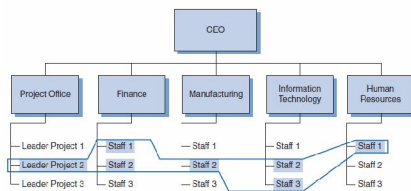
- One manager has authority and accountability
- Authority for work assignments and staff salary reviews
- Communication channels are direct and open
- Adaptability to changes is increased, decision making power is put in the hands of the project manager who is involved in the process daily
- Can build up considerable expertise from repetition of similar technologies

Drawbacks:

- Potential underutilization of resources or misallocation of resources
- Economies of scale when sharing resources (people and materials) across projects
- Project myopia, see only the project we are working on
- May be a lack of career progression possibilities (Flat structure)
- Support for administrative functions more difficult

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Matrix Organizational Structure



***3 forms:**
 - weak,
 - strong,
 - balanced

Benefits:

- 'Formal' project accountability and visibility
- More dynamic and adaptable to change
- Sharing of knowledge across projects is enhanced
- Policies and procedures can vary across projects
- Less stress about the project ending

Drawbacks:

- Multiple supervisors with competing priorities
- Budget and cost control becomes more difficult
- Project Team motivation
 - *who do I listen to...my boss who controls my salary or to the project manager who is giving me work assignments*
- Policies and procedures can vary across projects

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Organizational Structure's Influences on IT Projects

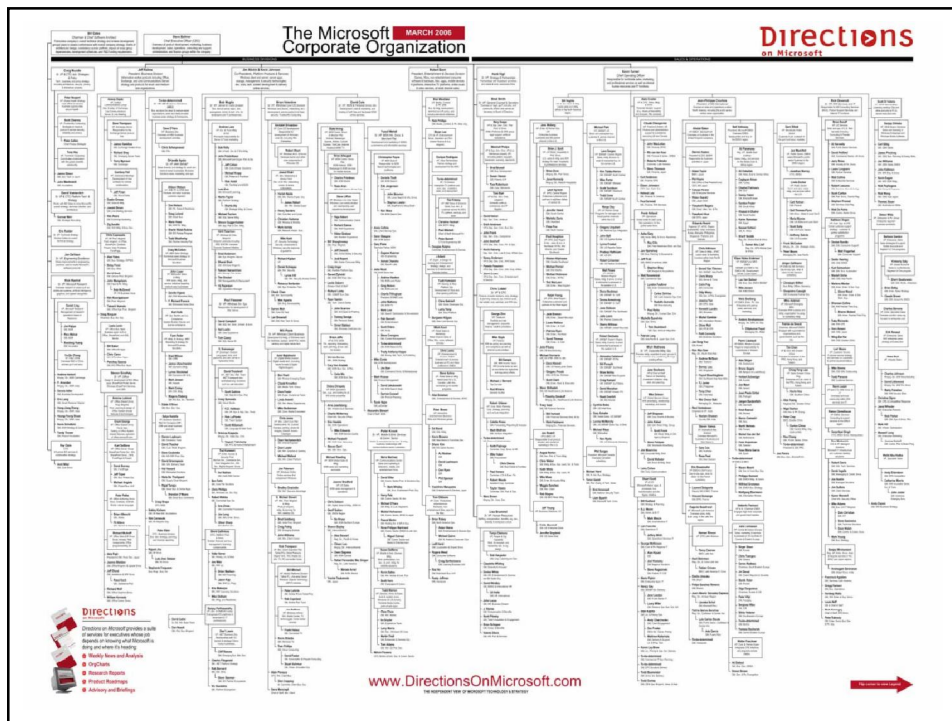
Organizational Structure Project Characteristics	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project manager's authority	Little or none	Limited	Low to moderate	Moderate to high	High to almost total
Resource availability	Little or none	Limited	Low to moderate	Moderate to high	High to almost total
Who controls the project budget	Functional manager	Functional manager	Mixed	Project manager	Project manager
Project manager's role	Part time	Part time	Full time	Full time	Full time
Project management administrative staff	Part time	Part time	Part time	Full time	Full time

Choosing the correct organizational structure depends on:

- The history of the organization
- The industry the organization is in
- Project characteristics

The tendency of many organizations today: Moving toward a matrix structure

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Constraints (Limits) of Real-World Project

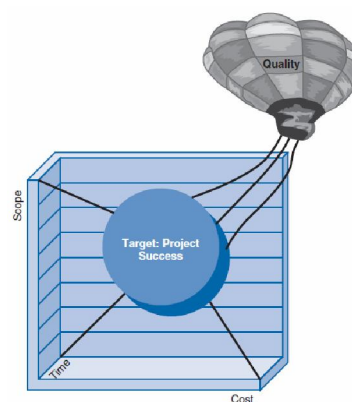
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Project Management: “Triple Constraint” Reality

Every project is constrained by a list of

- 1) **Scope:**
customer-requested requirements,
- 2) **Time:**
the amount of time available to produce the
system in support of the requirements,
- 3) **Cost:**
the limit of money available.

Every project is constrained differently,
according to the goals of the system owner
(sponsor) and the project team



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Software (Information Technology – IT) project success rate

TABLE 1-1 Standish Group Study Results

	1995	2001	2003
Successful IT projects	16.2%	28%	34%
Percentage of projects cancelled	31%	23%	18%
Average time overruns	222%	63%	82%
Average cost overruns	185%	45%	43%
Delivery of required features	61%	67%	52%

Project Category	Project Description	2000 Results	2003 Results
Project Success	The project is completed on-time and on-budget, with all features and functions as initially specified	16.2%	32%
Project Challenged	The project is completed and operational but over-budget, over the time estimate, and offers fewer features and functions than originally specified	52.7%	44%
Project Impaired	The project is cancelled at some point during the development cycle	31.1%	24%

Note – In 2000 in the US, the spend on IT application development is approximately \$250 billion and represents some 175000 projects. The average cost of a development project for a large company is \$2,322,000; for a medium company, it is \$1,331,000, and for a small company, it is \$434,000

Project Success Factors	% Responses
1. User Involvement	15.9%
2. Executive Management Support	13.9%
3. Clear Statement of Requirements	13.0%
4. Proper Planning	9.6%
5. Realistic Expectations	8.2%
6. Smaller Project Milestones	7.7%
7. Competent Staff	7.2%
8. Ownership	5.3%
9. Clear Vision & Objectives	2.9%
10. Hard-Working, Focused Staff	2.4%
Other	13.9%

Source: <http://www.claretyconsulting.com/it/comments/project-and-programme-failure-rates/2009-06-27/>

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Why SW Development Projects Fail? (with financial losses – billions of dollars!)

**65-80 % of SW development projects fail (!).
There may be many possible reasons.**

However, the key reasons are:

1. Failure in project management
2. Problems with Time Management -- unrealistic deadlines and/or timetable -- time overrun
3. Problems with Cost Management -- cost overrun
4. Predictable and unpredictable risks
5. Honest underestimate of effort
6. Technical difficulties (Internet, servers, computers, etc.)
7. Changing customer requirements (in the middle of the project)
8. Miscommunication among project members and groups (problems with communication)

Project and Programme Failure Rates

Posted by Kevin Brady on Sat 27th June 2009 at 04:26 PM. Filed in Programme Management, Project Management, Project Programme Failure, Industry News

During a recent trip to the British Library I thought I would take a quick look at the recently published **Standish CHAOS Survey** to see if we are improving our project and programme delivery failure rates.

I have to say the results of my investigation were very positive -

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Cost Overruns	% Responses	Time Overruns	% Responses	% of Features /functions	% Responses
Under 20%	15.5%	Under 20%	13.9%	Less than 25%	4.6%
21 – 50%	31.5%	21 – 50%	18.3%	25-49%	27.2%
51 – 100%	29.6%	51 – 100%	20.0%	50 – 74%	21.8%
101 – 200%	10.2%	101 – 200%	35.5%	75 – 99%	39.1%
201 – 400%	8.8%	201 – 400%	11.2%	100%	7.3%
Over 400%	4.4%	Over 400%	1.1%		

Source: <http://www.claretyconsulting.com/it/comments/project-and-programme-failure-rates/2009-06-27/>

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Project Manager

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Main Groups of PM Skills

- **Analytical Skills**
ability to see things as systems, identify, analyze, and solve problems in an optimal way for a specific organization.
- **Technical Skills**
ability to understand how computers, data networks, software, operating systems, etc. work together, as well as their potentials and limitations.
- **Management Skills**
include organization's resource management, project management (people and money), risk management, and change management.
- **Communication Skills**
include effective interpersonal communication (written, verbal, visual, electronic, face-to-face conversations, presentations in front of groups), listening, group facilitation skills.

Before 2000-2001: the only requirement: 100% technical skills
After 2001: the compound requirement: 25% - analytical skills
25% - technical skills
25% - management skills
25% - communication skills
Conclusion: CS/CIS degree with Mngt skills vs a degree in Management

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Top 7 Competencies of Project Manager

1. Communications Skills - verbal and written
2. Leadership Skills
3. Organizational Skills - planning, time management
4. Interpersonal Skills
5. Negotiation Skills - diplomacy and mediating
6. Team Building Skills
7. Technical Skills

Source: "Positive Leadership In Project Management" by Rachael Miletkov

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SE Project Manager's Activities

- | | |
|---|---|
| 1. Leadership | Influencing the activities of other members of project team |
| 2. Management (time, cost, HR, technology etc.) | Getting project completed. |
| 3. Customer Relations | Working closely with customers to assure project deliverables meet expectations |
| 4. Technical problem solving | Designing and sequencing activities to attain project goals |
| 5. Conflict management | Managing conflict within a project team |
| 6. Team Management | Managing the project team for effective performance |
| 7. Risk and change management | Identifying, assessing, and managing the risks and day-to-day changes |



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The Software Project Management / IT Project Management Profession: Positions available at Illinois or Chicago, IL

(987 positions open just in Illinois)

The screenshot shows a search results page on the Monster website. The search criteria are 'IT project management, Illinois, US'. The results table lists various job openings with columns for Date, Job Title, Company, and Location. A red circle highlights the number '987' in the pagination area, indicating the total number of results.

Date	Job Title	Company	Location
01/06	R&D IT Project Manager	Glotel, Inc.	Wauconda, IL
01/04	Sr. IT Project Manager (Call Center...	Paradigm Technol...	Deerfield, IL
01/04	Senior Trading IT Project Manager - ...	Placement Solu...	Chicago, IL, 606...
12/29	IT PROJECT MGMT SR SPECIALIST	CNA	Chicago, IL, 606...
01/29	TS&A- Project & Portfolio Managemen	Deloitte	Chicago, IL, 606...
01/27	Director - Project Management Offic...	Brightmachines, Inc...	Deerfield, IL, 6...
01/21	Investment Portfolio Management / P	Accenture	Chicago, IL
01/18	Commercial Installation and Service...	ADT Security Ser...	Oak Brook, IL, 6...
01/13	Project Manager - Change Manageme	Bewedge USA LLC	Chicago, IL, 602...
01/04	Senior IT Project Manager	The Judge Group	Riverwoods, IL, ...
01/31	IT Change Management Lead	MillerCoors	Chicago
01/06	Project Manager - Campaign Manager	Discover Financi...	Riverwoods, IL, ...
01/03	IT Change Management	Comsys	Chicago, IL, 606...

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Software Project Manager: An Example of Open Position (Chicago area)



The screenshot shows a job posting for a Software Project Manager at Sapphire Technologies. The job summary includes details about the company, location, and job type. The requirements section lists several key qualifications, with some items circled in red. The technical skills section also lists several project management skills, with some items circled in red.

Job Summary

Company: Sapphire Technologies
Location: Oak Park, IL 60458
Industries: Management Consulting Services
Job Type: Full Time, Temporary/Contract/Project
Career Level: Experienced (Non-Manager)
Job Reference Code: 221628

About the Job

Our client is in need of a Project Manager for a 6 month project in the North Chicago suburbs.

Requirements:

- Project Managers must possess at least 5+ years of experience in managing full life-cycle software development efforts, with direct responsibility for the project staff and project outcomes.
- At least 5+ years of experience in managing medium to large size projects
- Direct responsibility for project outcomes
- Direct supervisory responsibilities
- PMP Certification highly desired
- Managing the relationship with the project "buyer" (i.e. an executive business sponsor)
- Deep, beginning to end experience in managing at least one type of recognized software development life cycle (SDLC)
- Ability to write, facilitate, clearly articulate, and manage to the business case during the project

Technical:

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Quality Management
- Project Risk Management
- Project Cost Management
- Project Communications Management

Consultative:

- Organizing and Planning
- Problem Solving and Decision Making
- Negotiation and Diplomacy
- Facilitation
- Commitment to Task
- Team Building
- Innovation and Creativeness

Theory and special tools

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Requirements for SPM: Microsoft Project, Primavera, ...

ORACLE (Sign In | Register for Account | Subscribe) Secure!

Home Products and Services Industries Support Store Partners Communities About

ORACLE CORPORATION
 ABOUT ORACLE
 About Oracle Home
 Acquisitions
 Analyst Relations
 Board of Directors
 Contact Oracle
 Corporate Governance
 Customers
 Executives
 History
 Investor Relations
 Oracle Corporate Citizenship
 Oracle Insight
 Welcome to Oracle
 NEWS AND EVENTS
 Events
 Newsroom
 Oracle and Profit Magazines
 Oracle Newsletters
 Oracle Timeline
 RESOURCES
 Accessibility
 Advertising
 Careers
 Customer Visit Center
 License Management Services
 Pricing and Licensing
 Oracle and European Union
 Oracle User Experience

Oracle and Primavera

Oracle has acquired Primavera Software, Inc., a leading provider of Project Portfolio Management (PPM) solutions for project-intensive industries. Primavera offers best-in-class solutions focused on the mission critical PPM requirements of key vertical industries including engineering and construction, public sector, aerospace and defense, utilities, oil and gas, manufacturing and high tech, and IT and services.

Primavera's PPM products, together with Oracle's project financials, human resources, supply chain management, product lifecycle management, business intelligence, and infrastructure software are expected to provide the first, comprehensive Enterprise Project Portfolio Management solution. This solution is expected to help companies optimize resources and the supply chain, reduce costs, manage changes, meet delivery dates, and ultimately make better decisions, all by using real-time data.

- Read the press release
- Support for Primavera Products
- For information on Primavera License Files and Registration, please see the Primavera License Codes page

PRIMAVERA PRODUCTS

- Oracle's Primavera Enterprise Project Portfolio Management Applications
- Oracle's Primavera P6 Enterprise Project Portfolio Management
- Oracle's Primavera P6 Professional Project Management
- Oracle's Primavera Portfolio Management
- Oracle's Primavera Contract Management
- Oracle's Primavera Risk Analysis
- Oracle's Primavera Earned Value Management
- Oracle's Primavera Contractor
- Oracle's Primavera SureTrak
- Primavera P3 Project Planner
- Primavera Inspire for SAP

PRIMAVERA INDUSTRY SOLUTIONS

- Primavera Enterprise Project Portfolio Management, Aerospace and Defense
- Primavera Enterprise Project Portfolio Management, Defense
- Primavera Enterprise Project Portfolio Management, Engineering and Construction
- Primavera Enterprise Project Portfolio Management, High-Tech/IT/IS
- Primavera Enterprise Project Portfolio Management, Industrial Manufacturing
- Primavera Enterprise Project Portfolio Management, Oil and Gas
- Primavera Enterprise Project Portfolio Management, Professional Services
- Primavera Enterprise Project Portfolio Management, Public Sector
- Primavera Enterprise Project Portfolio Management, Utilities

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SAPPHIRE
a Randstad company

**Software Project Manager:
An Example of
Open Position
(Chicago area)**

Job Summary

Company
Sapphire Technologies
Location
Des Plaines, IL 60018
Industries
Management Consulting Services
Job Type
• Full Time
• Temporary/Contract/Project
Career Level
Experienced (Non-Manager)
Job Reference Code
225628

Software Project Manager

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- At least 5+ years of experience in managing medium to large size projects
- Direct responsibility for project outcomes
- Direct responsibility for project resources
- PMP Certification highly desired**
- Managing the relationship with the project "buyer" (i.e. an executive business sponsor)
- Deep, beginning-to-end experience in managing at least one type of recognized software development life cycle (SDLC)
- Ability to assist in developing, clearly articulate, and manage to the business case driving the project

Technical:

- Project Integration Management
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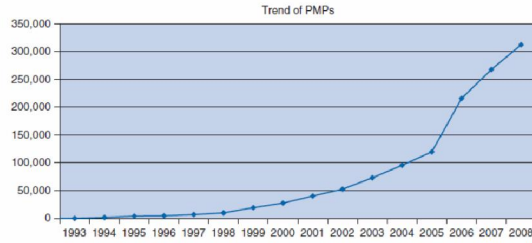
- Organizing and Planning
- Problem Solving and Decision Making
- Negotiation and Diplomacy
- Facilitation
- Commitment to Task
- Team Building
- Innovation and Creativeness

PMP Certificate

Sapphire Technologies is an EOE/DFW/DF and is a wholly owned subsidiary of Randstad Holding Inc, a \$17.7 billion global provider of professional employment services and the second largest staffing organization in the world. [SAPPHIRE](#)

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Project Management Professional (PMP) Certification: Significant Growth in 1993 – 2010

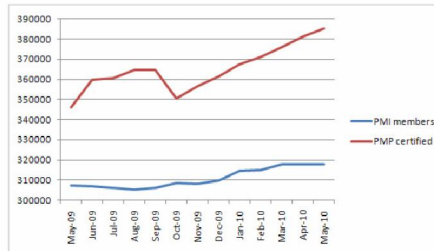


PMI provides certification as a Project Management Professional (PMP)

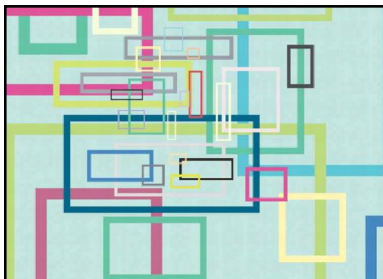
A PMP has documented sufficient project experience (3 years), agreed to follow a code of ethics, and passed the PMP exam (200 questions in 4 hours)

More on certification found in Appendix C

Total PMI members and PMP certifications worldwide



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Methods of IT Project Management

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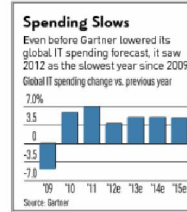
Chapter 1

Introduction to Project Management
(additional information)

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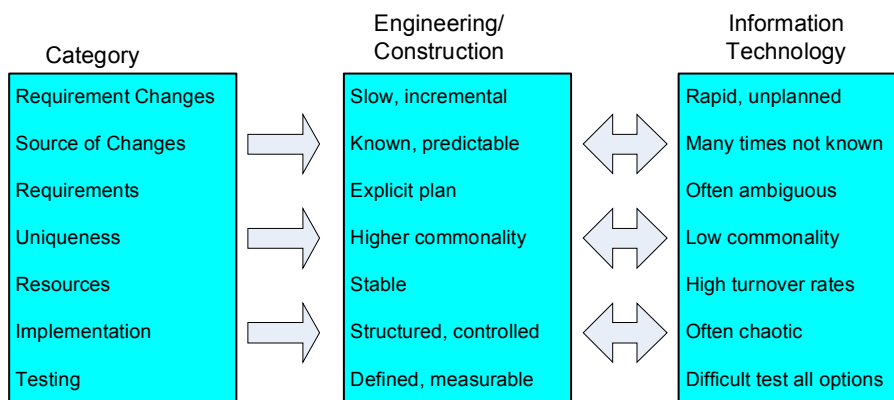
Importance of Software Project Management

- Due to the size, complexity, and number of information technology (IT) projects, organizations face ever-increasing challenges
- Global U.S. government IT spending topped \$150 billion in 2007
- Forrester Research estimates that global IT spending—purchases of computers, software, and services by companies and governments—was about \$ 1.66 trillion = \$ 1,600 billion in 2009
- Forrester Research estimates that about 20 percent of current IT budgets are going into project management/development



Source: <http://news.investors.com/Article/5968856/201201051757/2012-information-technology-spending-outlook-lowered.htm>

IT Projects Are Different (from traditional projects)



Advantages of Using Formal Project Management Practices

- Improvement in customer satisfaction
- Tracking of project activities by a customer, stakeholders, ...
- Increased quality of project activities and solutions
- Better cost performance, higher return on investment

- Better schedule performance
- Better allocation of time commitments
- Better utilization of time, human, technology and other type of resources
- Higher productivity
- Increased quality reducing re-work
- Increase in delivering required features

- Will make everyone happier (stakeholders, team members, management...)

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Software Project Management Success Rates (2009). Why SW/IT Projects Fail (with financial losses – billions of dollars!)?

Boston, Massachusetts, April 23, 2009 - New Standish Group report shows more project failing and less successful projects.

The Standish Group's just-released report, "CHAOS Summary 2009," "This year's results show a marked decrease in project success rates, with 32% of all projects succeeding which are delivered on time, on budget, with required features and functions" says Jim Johnson, chairman of The Standish Group, "44% were challenged which are late, over budget, and/or with less than the required features and functions and 74% failed which are cancelled prior to completion or delivered and never used."

"These numbers represent a downturn in the success rates from the previous study, as well as a significant increase in the number of failures", says Jim Crear, Standish Group CIO, "They are low point in the last five study periods. This year's results represent the highest failure rate in over a decade"

In the "CHAOS Summary 2009" report The Standish Group has re-examined 10 the CHAOS Success Factors. Each Success Factor is supported by one of the Laws of CHAOS. The Standish Group's "CHAOS Summary 2009" report is available free of charge to Standish Group subscribers. Non-subscribers may obtain copies directly from The Standish Group for \$99.00 per copy and the offer also includes Jim Johnson's book "My Life is Failure".

There may be many possible reasons. However, the key reasons are:

1. **Failure in project management**
2. **Unrealistic deadlines** and/or timetable
3. **Miscommunication** among project members and groups
(problems with communication)
4. **Technical difficulties** (Internet, servers, computers, etc.)
5. **Honest underestimate of effort**
6. **Predictable and unpredictable risks**
7. **Changing customer requirements** (in the middle of the project)

TABLE 1-1 Standish Group Study Results

	1995	2001	2003
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Software (IT, CIS) Project Management as a Profession
(U.S. Department of Labor, Bureau of Labor and Statistics)
<http://www.bls.gov/oco/ocos258.htm>

Computer and information systems managers direct the work of other IT professionals, such as [computer software engineers and computer programmers](#), [computer systems analysts](#), and [computer support specialists](#)

The screenshot shows the Bureau of Labor Statistics website for the Occupational Outlook Handbook, 2010-11 Edition. The page is titled "Computer and Information Systems Managers". The left sidebar contains a navigation menu with categories such as OVERVIEW OF THE 2008-18 PROJECTIONS, MANAGEMENT, PROFESSIONAL, SERVICE, SALES, ADMINISTRATIVE, FARMING, CONSTRUCTION, INSTALLATION, PRODUCTION, TRANSPORTATION, ARMED FORCES, and SPECIAL FEATURES. The main content area is divided into two sections: "Computer and Information Systems Managers" and "Significant Points".

Computer and Information Systems Managers

- [Nature of the Work](#)
- [Training, Other Qualifications, and Advancement](#)
- [Employment](#)
- [Job Outlook](#)
- [Projections](#)
- [Earnings](#)
- [Wages](#)
- [Related Occupations](#)
- [Sources of Additional Information](#)

Significant Points

- Employment is expected to grow faster than the average for all occupations.
- A bachelor's degree in a computer-related field usually is required for management positions, although employers often prefer a graduate degree, especially an MBA with technology as a core component.
- Many managers possess advanced technical knowledge gained from working in a computer occupation.
- Job prospects should be excellent.