Subject Overview

Lecturer: Dr. Igor Kharitonenko
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Lecturer

Dr. Igor Kharitonenko

More than 30 years of industrial and academic experience
1995-2003 : Principal Research Engineer, *Motorola*
Currently : Senior Lecturer

Research areas:
Image and Video Processing,
Computer Vision,
Intelligent Video Surveillance Systems,
Multimedia Systems

Publications: 40 papers published, 9 patents (US, AU and Japan)

Objectives of CSIT214/CSCI814

- On successful completion of this subject, students are expected to:
  - Get familiar with the concepts and best practices of project management acknowledged by the Project Management Institute
  - Select and apply appropriate concepts to manage IT projects
  - Function effectively as part of a project team and communicate with project stakeholders
  - Collect, analyse and present relevant information
  - Plan and monitor project progress using project management software

Method of Presentation

The teaching process is optimised to introduce key theoretical concepts and get practical skills in IT project management

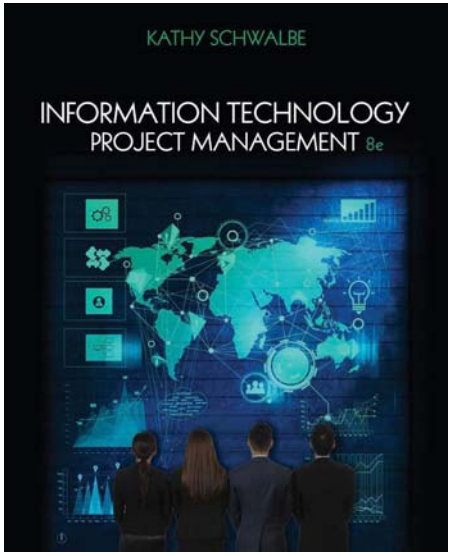
- Lectures : 2 hours/week
- Labs: 2 hours/week
- Assignments : Lab exercises and a Group Project

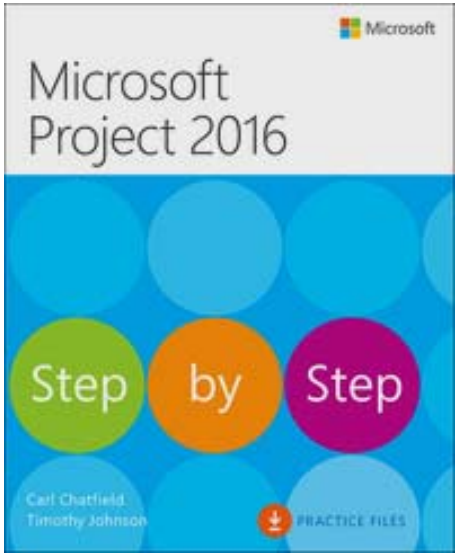
This is a 6 credit point subject. The amount of time spent on this subject should be **at least 12 hour per week** including **self-directed study**

- review lectures
- read recommended textbook chapters and answer quiz questions
- get familiar with the project management software
- arrange and attend group project meetings
- attend consultations

Subject Materials

- Textbook and reference books





eBooks, use the UOW library web site

- Lecture notes are available on the subject web site in the section *Lectures*
- Laboratory exercises and lab assignments: the instructions are in the section *Lab Exercises*
- Group Assignment (Project): the assignment description is available on the subject web site in the section *Group Assignment*

Assessment

Assessment items	Percentage of Final Mark		Due date
	Marks for the item	TF threshold	
Lab exercises/assignments (individual)	20		See the assignments
Group Assignment	40	12	See the assignment
Final Examination	40	12	Exam week as per schedule
Total	100	50	*The mark must be ≥50 to pass the subject*

Assessment

Lab exercises/assignments

- To be completed individually and presented to the lab instructors
- Assessed in the lab during the current lab session (if completed) or at the start of the next lab session (if extension needed). Checking correctness of your solutions, lab instructors may ask additional questions.
- If you come to the lab late when the instructors have already finished marking, or your solution is not ready by the assessment time (*e.g.* start of the next lab session) your work will not be assessed and marked (0)
- You cannot leave the lab earlier if your solution has not been assessed and you have no instructor's approval to leave. If you leave earlier without approval, your attendance may not be counted.

Example: The lab exercise w3

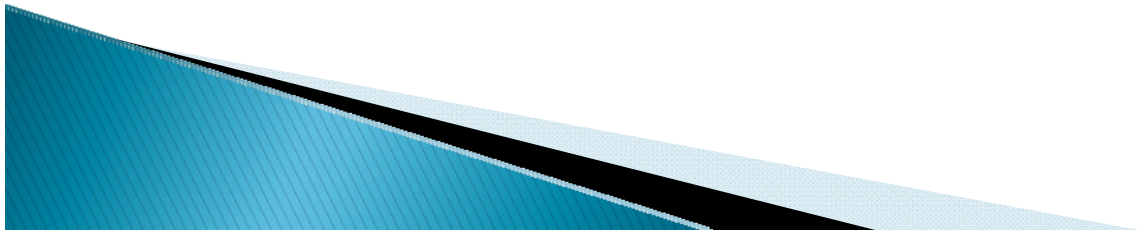
You can start working on it in the lab, or you may complete it at home before the lab session (academic week 3). Ideally, each lab exercise should be completed and assessed by the end of the current lab session (week 3). Once your work is marked, you may leave the lab if it's been approved by an instructor.

If the solution is only partially completed by the end of the session, the exercise can be completed during a week. However, it must be ready for assessment before the next lab session begins (week 4). If it is not ready by the start of the week4 session, no further extension will be given and your mark will be 0.

Assessment

Group Assignment (Project)

- You will be assigned to one of the project teams
- The project shall be completed and all deliverables submitted according to the requirements by the due date (see the assignment spec). The system will stop accepting submissions after the due date. No extension will be given.
- The projects shall be presented by teams in the lab using MS Power Point
- All team members must attend presentations to avoid loosing marks



Assessment

When you submit an assessment task, you are declaring the following:

1. It is your own work and you did not copy from others
2. You have read and understand your responsibilities under the UOW's policy on plagiarism.
3. You have not plagiarised from published work (including various internet sources). Where you have used the work from others, you have referenced it in the submitted solution and provided a reference in the comments.

Consultation Times

Wollongong

Wednesday 13:30 – 15:30 (3.108 or 3.127)

SWS

Friday 12:30 – 14:30

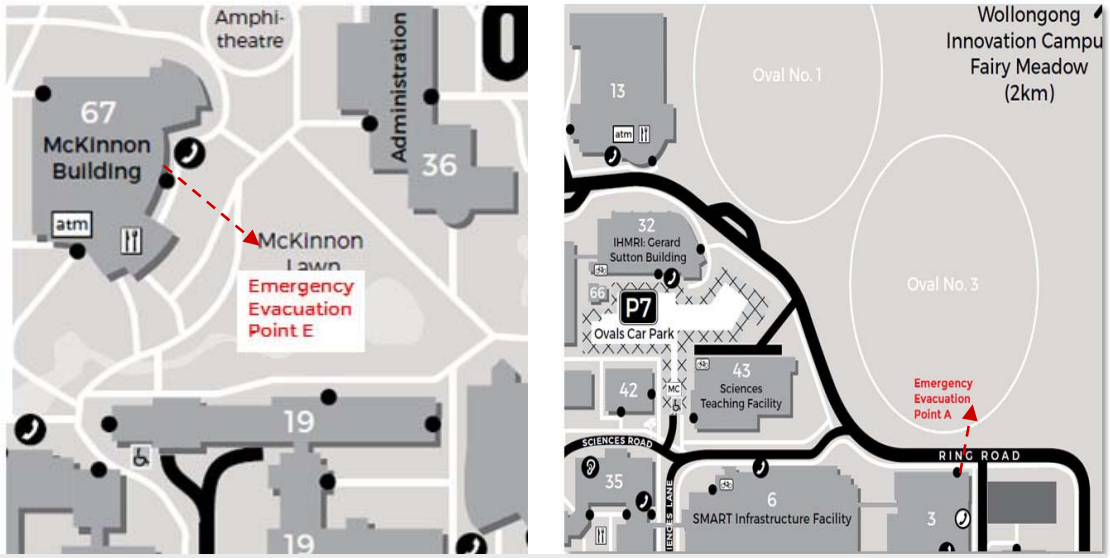
Emergency Evacuation Procedure

- Turn off electrical equipment, secure any personal belongings
- Leave the building immediately via the nearest exit
- Proceed to the emergency evacuation point
- Do not re-enter the building until advised

Emergency Evacuation Points:

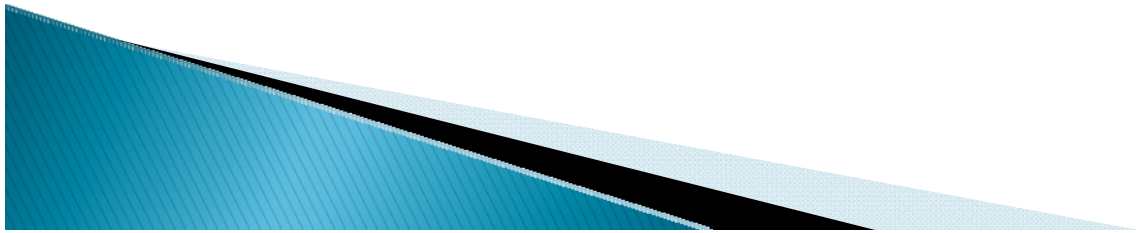
Lectures

Labs

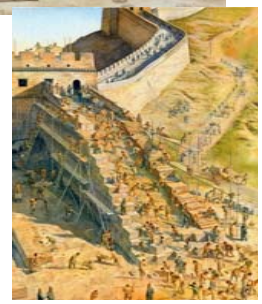


Wollongong campus

Introduction to Project Management



Introduction



- People have been undertaking projects since the earliest days of organized activity

- All of us undertake projects in our daily life

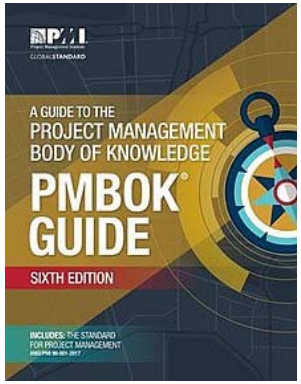
- Although people have been carrying out projects for millennia, project management was termed the “accidental profession” with relevant skills typically acquired in a hit-or-miss manner
  - costly mistakes, reinvention of efficient methodologies
- The concept and methodology of modern project management emerged quite recently

Introduction

- Until 80s, project management addressed issues of the manufacturing economy with the focus on predictable and repetitive activities, standardization and optimization
- When the world economy entered a post industrial phase, many of the management methodologies no longer worked well in an information economy
- The Project Management Institute (PMI) is an international nonprofit professional organization that coordinates standardization of project management procedures and approaches, publication, training and provides certification programs in project management
- PMI created a framework PMBOK for guiding project management
- PMI certification as a Project Management Professional (PMP) is a de facto industrial standard for experienced project managers
- Certified Associate in Project Management (CAPM) is an entry-level certification for professionals without project management experience

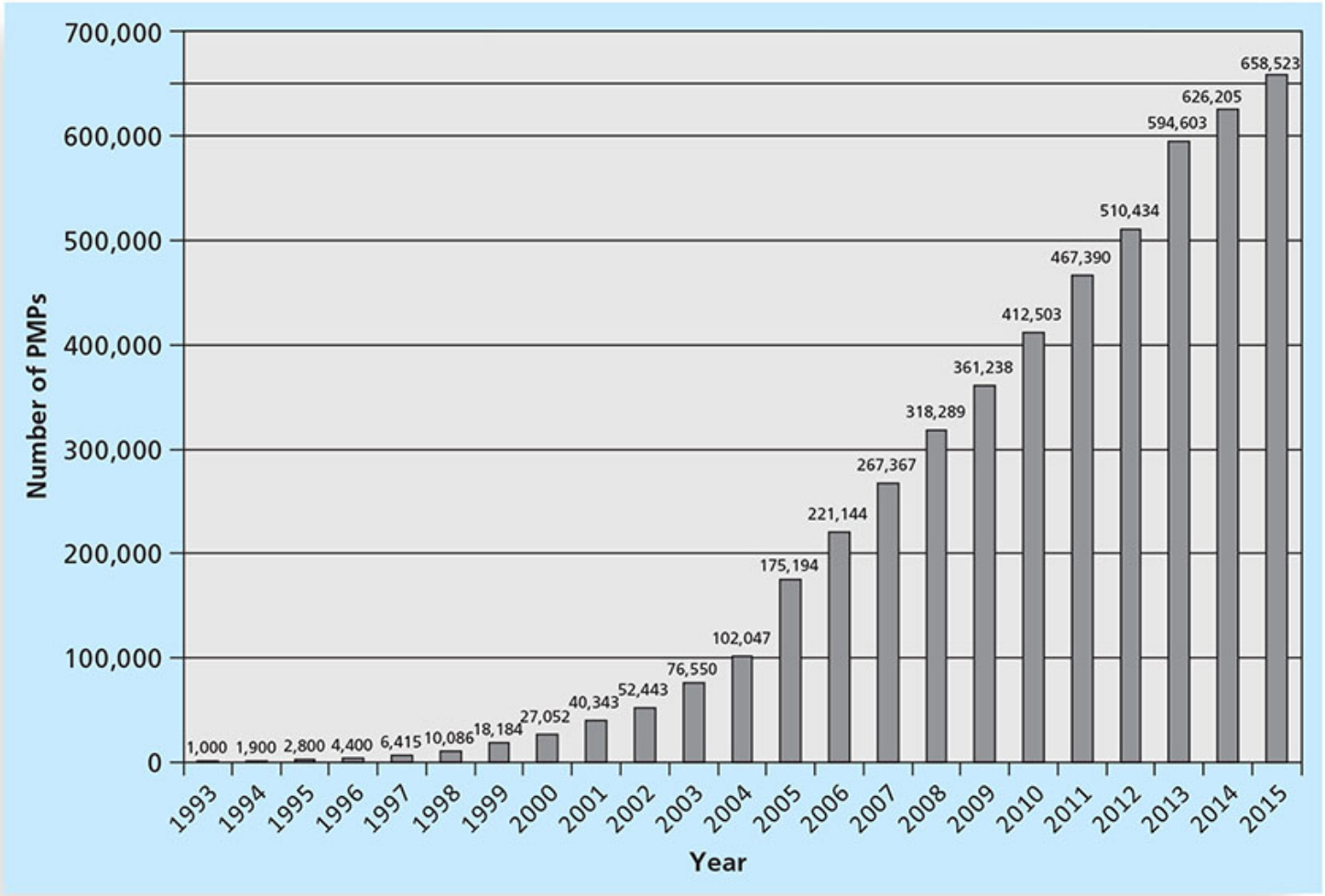
see www.pmi.org for details

PMBOK



- The Project Management Body of Knowledge is a set of recommended practices and guidelines for project management
  - the first edition was released in 1996
  - the latest version is the sixth edition released in 2017
- Not all recently published project management practices are acknowledged by PMI and included in PMBOK
- PMBOK is consistent with the ISO 9000 standard that describes quality management principles
- There are alternatives to the PMBOK standard, and PMBOK does have its critics
  - it doesn't cover development of personal skills that categorise efficient project manages (leadership, visionary, problem solving, conflict resolution)

PMP Certification 1993-2015



Motivation for Studying Information Technology (IT) Project Management

- IT Projects have a poor track record
- A 1995 Standish Group study found that only 16.2% of IT projects were successful in meeting their scope, time, and cost goals while over 31% of IT projects were canceled before completion
- The latest reports studied nearly 50,000 projects around the world

	2011	2012	2013	2014	2015
SUCCESSFUL	29%	27%	31%	28%	29%
FAILED	22%	17%	19%	17%	19%

	SUCCESSFUL	FAILED
Grand	2%	17%
Large	6%	24%
Medium	9%	31%
Moderate	21%	17%
Small	62%	11%

- Globally, organizations wasted an average of $97 million for every $1 billion invested in IT projects and programs in 2016

What has changed since 90s?
What needs to be done?

Advantages of Using Formal Project Management

Formal Project Management is not a miracle that can guarantee successful completion of projects, but it helps to run projects more efficiently and increase your chances of success

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

What Is a Project?

- **A project**: “a temporary endeavor undertaken to create a unique product, service, or result”
  (PMBOK® Guide, Fifth Edition)
- Project managers are responsible for running projects

- **Not a project**: Business Operations refer to activities that companies engage in on a daily basis to sustain the business
- Operations managers are responsible for overseeing, directing, and controlling business operations

Quiz:

- Ordering and stocking products that customers are looking for
- Maintenance of an online flight booking system
- Development of a computer vision system for self-driving cars
- Porting of a software system to a new hardware platform

Project Attributes

- Regardless of the application area, all projects share the same set of features
  - they are goal oriented
  - they have finite duration
  - they are, to a degree, unique and involve uncertainty
  - they are developed using progressive elaboration
  - they require resources
  - they should have customers and sponsors

Projects: Goal Orientation

- Before you start a project, you need to clearly define its objective and what results it will aim for
- The project goals drive a project, while all planning and other activities are undertaken to achieve them
- The best way to make an objective clear is to define it in such a way that it can be measurable
- Make sure that all involved in a project understand "This is what we're doing. This is why we're doing it. Here's what success looks like."

(*M Wagner, Producer of Digital Marketing at HBO)*

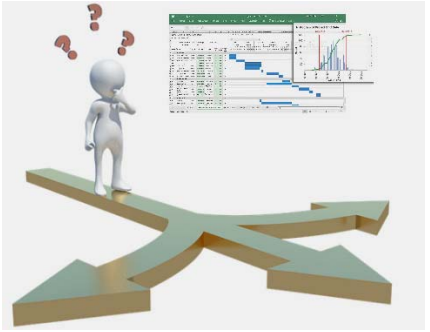
- A clear goal is not enough, it must be achievable
- A process need to be set up for monitoring and reporting on goals

Projects: Finite Duration

- Projects cannot last indefinitely. They must have well-defined beginnings and ends.
- Substantial project efforts are dedicated to ensuring that the project will be completed by the appointed time
- Careful scheduling and time management are essential
- IT project team responsibility is usually extended beyond the project deadline because a software system doesn't have much value for clients unless it's supported and maintained

Projects: Uniqueness

- Uniqueness of projects is not determined only how innovative they are
- Projects are one-of-a-kind undertaking with specific goals and constrains. The extent of uniqueness can vary considerably
  - Online flight booking system -> Online train ticket booking system
  - AI system for home robots
- Uniqueness of projects leads to uncertainty that makes past experience less reliable and estimation of risk factors, time and budget more difficult
- Risk management is vital



Projects: Progressive Elaboration

- Even small scale projects result in multiple activities that are related to each other
- Some activities cannot be started until others are completed
- As the project progresses and prototypes are developed, some project requirements may need to be reviewed. Projects should be developed in increments that requires complex project workflow models.
- A project can be considered as a system that leads to a system approach to project management

Projects: Resources

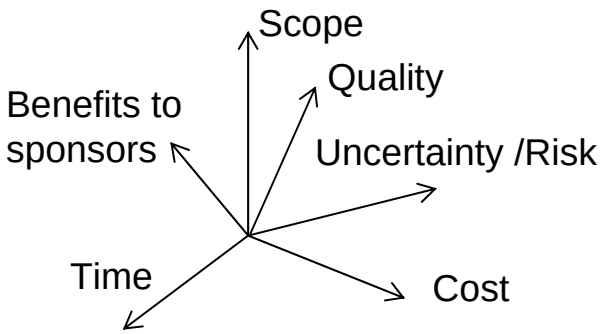
- Project resources are anything that is necessary for the project to be completed
  - Human: skilled team members and contractors
  - Financial: money that can be used to run the project
  - Equipment: computers, phones, network equipment, *etc*
  - Technology: software, licences, patents, *etc*
- Managing resources in projects is a core skill, as their availability determines a project success or failure
- It’s always better to ask for resources you need at the beginning, rather than getting stuck halfway and ask then for additional resources

Projects: Customers and Sponsors

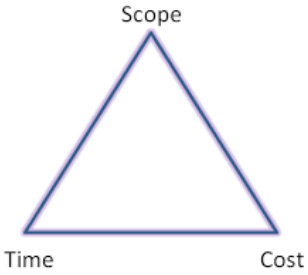
- The main purpose of the project of any kind is to meet customer needs and expectations
  - some customers may not have a clear picture of what they need
  - some customers may want to get the results unrealistically fast
  - some customers act as external managers
  - some customers are always busy and don't engage when needed
- Projects need a sponsor to succeed
- The project sponsor is a top executive with appropriate level of authority who is most interested in successful completion and achieving expected business benefits
  - Identifies benefits, initiates the project and makes strategic decisions
  - authorizes the necessary resources, controls financing of the project
  - takes care of engagement processes

Project Constraints

- A project can be considered as a system dynamically expanding inside a constrained multidimensional space of its attributes
- A project cannot expand indefinitely and some attributes should be constrained



- The three primary project constraints to be addressed are time, scope and cost
  - Time constraint: is defined by its schedule for completion
  - Scope constraint: is defined by its goals, deliverables, specs
  - Cost constraint: is defined by project budget
- Each constraint is connected to the other two



The Triple Constraints

Project Stakeholders

- Stakeholders are all people involved in or affected by project activities
- Stakeholders include
  - the project sponsor
  - the project manager
  - the project team
  - contractors
  - customers
  - users
  - suppliers
  - opponents to the project

What is Project Management?

- **Project management** is “the application of knowledge, skills, tools and techniques to project activities to meet project requirements”

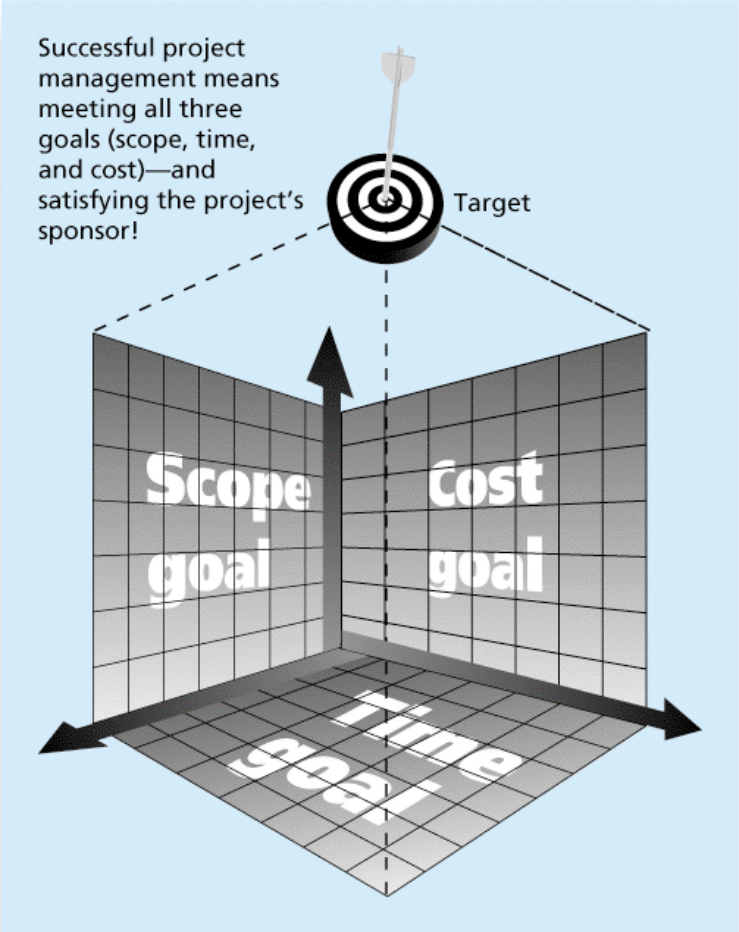
  (PMBOK® Guide, Fifth Edition)

- Project manager’s job is to facilitate the process to
  - cope with the **triple constraint** (scope, time, and cost)
  - meet the needs and expectations of project stakeholders
- Of the three constraints, is the most difficult to manage is scope (specs) as it may not always be measurable
- PMBOK provides a set of recommended practices and guidelines to help project management cope with the triple constraint

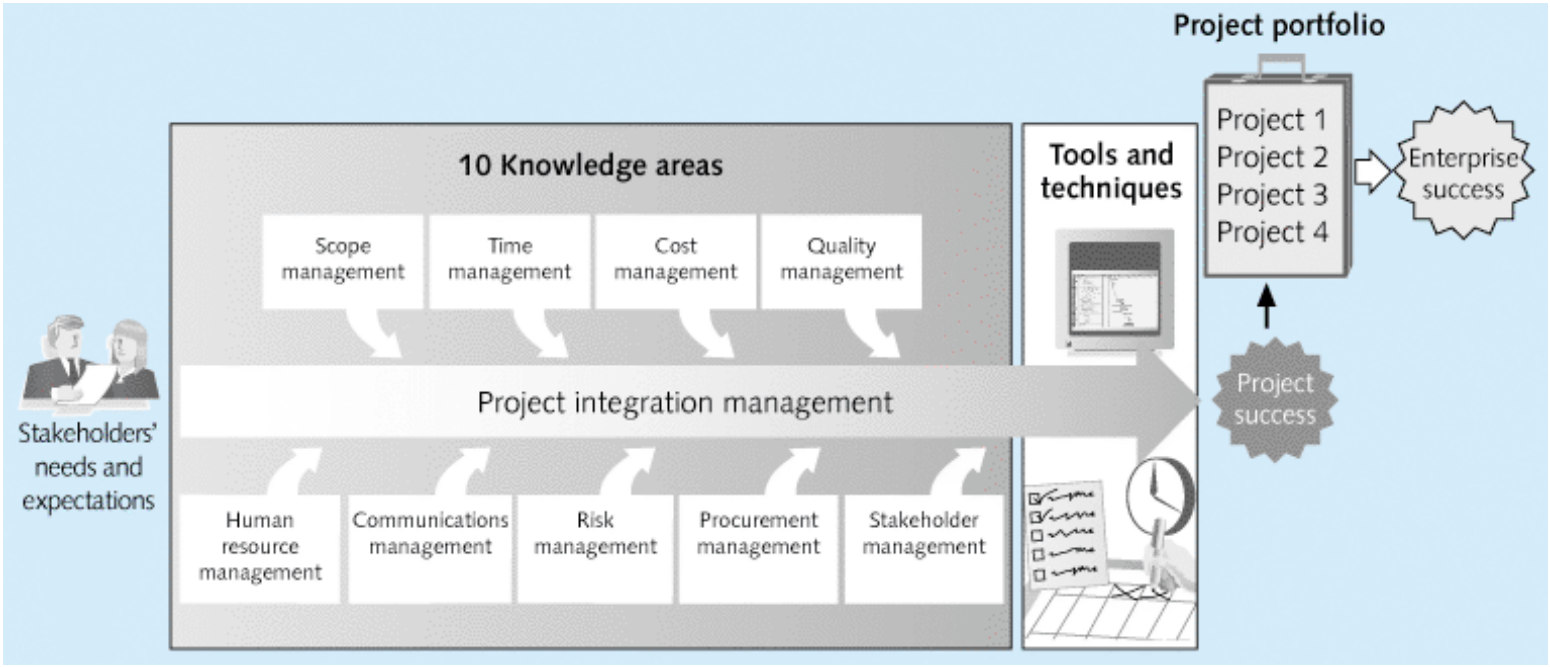
The Triple Constraint of Project Management

- As each constraint is connected to the other two, if you change one of the constraints, it will directly affect the other two constraints
- Managing the triple constraint involves making trade-offs

  Example: increasing the scope of the project (15 web pages instead of 10) will likely require more time and money
- In reality, it's crucial to understand interrelation between all constraints of a project besides the triple one
- Managing multiple constraints may be difficult without tools and software



Project Management Frameworks

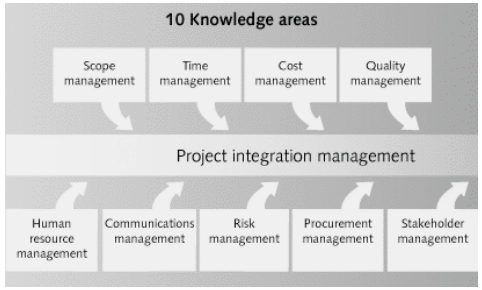


- A project management framework consists of the processes, methodologies and tools used to manage a project from start to finish
- It describes all the key components required for planning, execution and handling constraints and how to organize the workflow
- There are several widely used frameworks optimised for different needs

10 Project Management Knowledge Areas

What do I need to know to succeed at project management?

- Knowledge areas describe the key competencies that project managers must develop
- According to PMBOK, 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)
- Project management knowledge areas are fundamental for project management, but this knowledge must be complemented with practical skills in using project management tools and software



The most important skills and competences

What skills are important to succeed at project management?

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. Understanding and balancing priorities

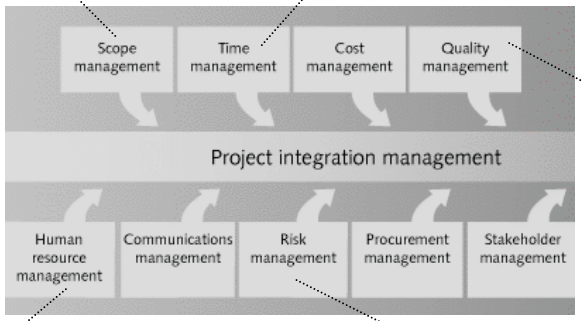
Priorities among skills depend on the project

Project Management Tools and Techniques

- Project management tools and techniques help to organize, efficiently monitor and manage project activities

How to formally define the project scope?
- analysis of requirements
- scope statements
- work breakdown structure

How to plan and monitor project progress?
- Gantt charts
- critical path analysis
- project network diagrams



How to measure quality?
- stetting quality metrics
- pareto analysis
- test plans

How to manage people?
- motivation techniques
- team building
- responsibility matrices

How to identify and minimize risk factors?
- risk ranking techniques
- probability risk matrices
- risk management plan

Project Success

- Projects are multidimensional activities that makes measurement of their success difficult
- Historically, several ways have been used to define project success:
  - The project meets scope, time, and cost goals
  - The project satisfied the needs of customers
  - The results of the project met its main business objective, such as making or saving a certain amount of money, providing a good return on investment, or simply making the sponsors happy
- A project can be considered successful if the success criteria is defined from the start

What helps project succeed?

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

The Standish Group, "CHAOS Manifesto 2013: Think Big, Act Small"

You can relatively quickly learn how to use the most efficient management tools and techniques. Investing in teams and building teams take much longer, but offer the best payout in the end

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

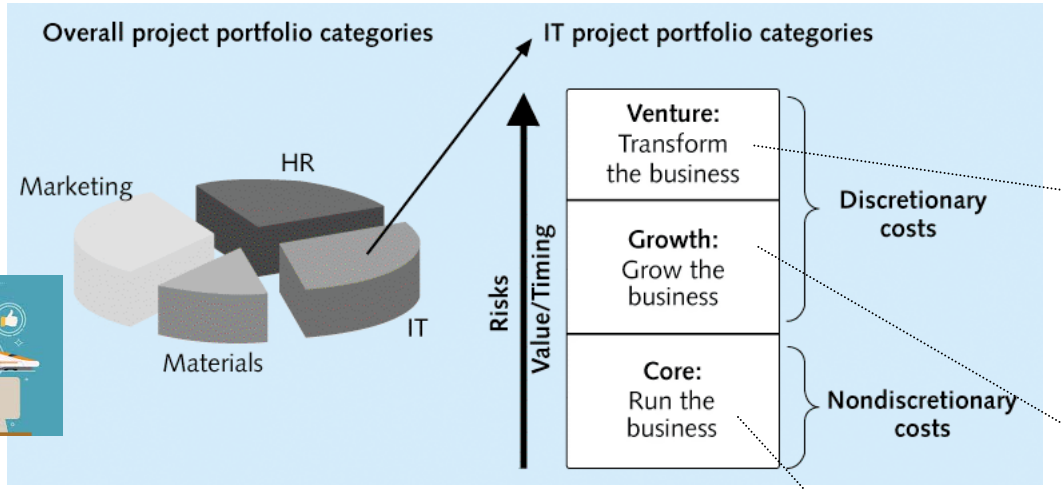
  (PMBOK® Guide, Fifth Edition)

- Program managers
  - oversee programs
  - provide leadership and direction for project managers
  - should have strong business knowledge, leadership, corporate politics, communication skills

Project Portfolio Management

- Companies can 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
- Portfolio managers should have vision, strong financial and analytical skills

Project Portfolio Management



Project: Development of an online local train reservation system
Project: Development of an online domestic flight reservation system

Project: Development of an online travel booking system with a consolidated train, flight and hotel search engine

Project: An office system for searching the best connecting flights according to specified criteria

- Core: projects must be accomplished to keep running the business. The company has no choice but to fund them.
- Venture and Growth projects are not critical for the company's survival. The company can fund them when it's possible.

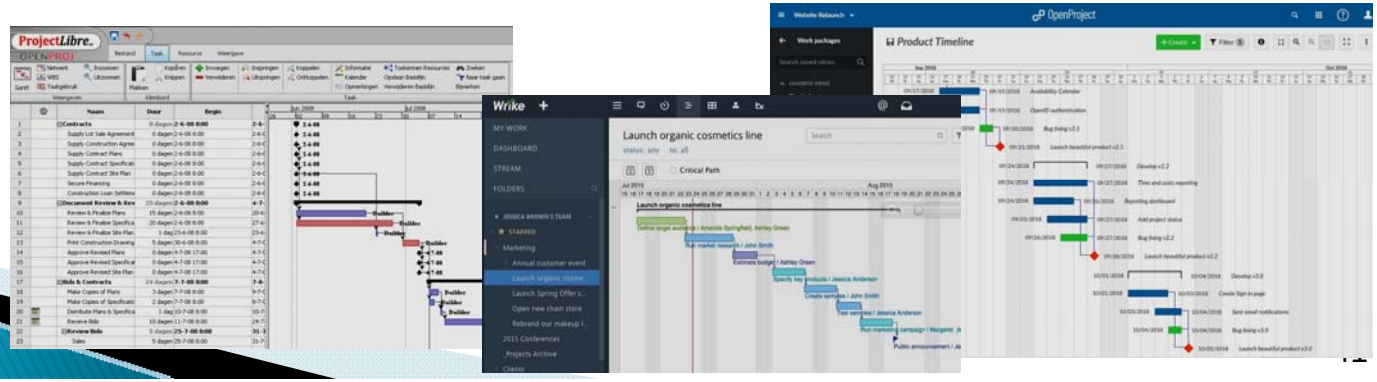
Ethics in Project Management

- **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 and follow it
- Several questions on the PMP exam are related to professional responsibility, including ethics

Project Management Software

- There are many 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
  - Mid-range tools: Handle multiple projects and users, cost $200-$1,000 per user. Microsoft Project is most popular
  - High-end tools: Also called enterprise project management software, often licensed on a per-user basis
- Several free or open-source tools are also available

- ProjectLibre
- Asana
- Wrike
- OpenProject



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