# Project Management, Risk, and Reliability

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# Administration

**What is this course on CDUX?**

- This course has been designed to give you a taste of Project Management, Risk and Reliability (PRT551) at Charles Darwin University;
- This course is part of Charles Darwin University's Master of Engineering program;
- The content delivered on this platform (CDUX) is the first 4 weeks of PRT551, which includes the first assignment for the course;
- The assignment makes up 15% of your grade for the course, and is credit eligible should you decide to continue your studies with Charles Darwin University

**How should you study this course?**

- There are short 5 to 6 minute lectures which cover the intended learning outcomes each week.
- Lecture slides are provided on the home page of the course for each week - you should print these out and take notes along with each lecture to help learn the course material.
- Each 5 to 6 minute lecture is punctuated by some short exercises. Studies show that students learn more effectively when they are actively engaging with the content - make sure you have a go at these exercises.
- There are tutorial exercises at the end of each week which will further help you to master the intended learning outcomes, and build the skills you need to address the final assignment.

# Textbook & Dicussion Forum

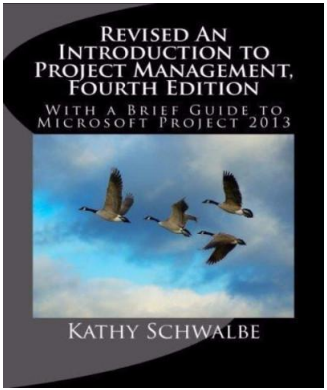



Figure: The textbook which is prescribed for the course.

## Discussion Forum

To promote community learning there is a discussion forum on which you can interact with your peers. Use this to ask questions if you are stuck, however, please observe the following etiquette on the forum:

- Polite respectful discourse is a must - the forum will be monitored and any offending material will be removed.
- You are encouraged to help each other on the forum, but please do not post answers to the questions or tutorial questions.

# Learning Objectives

The learning objectives for this week are:

- Understand the growing need for better project, program, and portfolio management.
- Explain what a **project** is, provide examples of projects, list various **attributes of projects**, and discuss the **triple constraints** of project management.
- Describe **project management** and key elements of the **project management framework**, including project **stakeholders**, **project management knowledge areas**, **common tools and techniques**, and **project success factors**.
- Discuss the relationship between project, program, and portfolio management and their contribution to enterprise success.
- Describe the project management profession.

# Introduction


Figure: The demand for the project management skill set is growing.

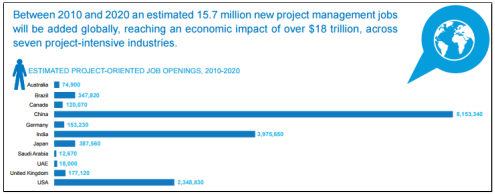



Figure: Many countries have a large number of projected opportunities for growth in the project management profession.

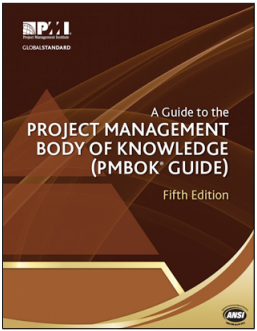
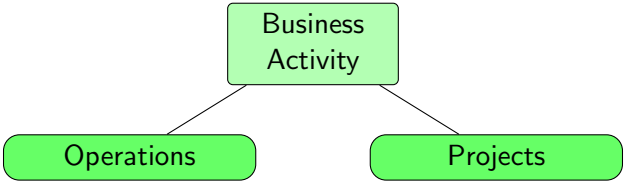



Figure: The PMBOK is an authoritative guide to the project management profession, and this course will make reference to it frequently.

(Source: http://www.pmi.org/-/media/pmi/documents/public/pdf/business-solutions/project-management-skills-gap-report.pdf)

# What is a project?

Business activities can be roughly categorised into the following 2 categories:




**Definition: Project**

A **project** is a temporary endeavour undertaken to create a unique product, service, or result.

**Definition: Operation**

An **operation** is on-going work done in an organisation to sustain the business.

# Project Attributes

A **project** is distinguished by a number of attributes, most notably a project:

- has a unique purpose;
- is temporary;
- is developed using progressive elaboration or in an iterative fashion;
- 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 Success

There are different ways to define project success. Some of them include:

- The project satisfied the customer/sponsor.
- The project met all of the desired results.
- The project achieved the desired outcomes and met **scope**, **time**, and **cost** constraints.

# Project Constraints

Every project is constrained in different ways, however, many project managers choose to focus on three simple categories (often called the **triple constraints**):

- **Scope**: is the work that will be done as part of the project. More specifically, it is the product, service, or result that the customer or sponsor expects from completion of the project.
- **Time**: is the time it should take to complete the project, and the project's schedule.
- **Cost**: is the costs involved with completing the project.

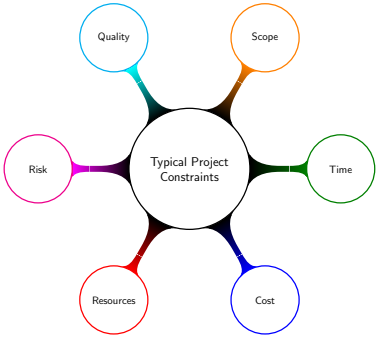



Figure: There are other constraints that are considered also, shown in the figure above.

# A Handy Mathematical Analogy

Suppose $\mathbf{x}$ is a vector of inputs to the project that a project manager can control. It can be useful to think of a project as the following optimisation problem:

$$\begin{aligned} \max_{\mathbf{x}} \quad & f_{\text{success}}(\mathbf{x}) \\ \text{s.t.} \quad & \text{scope}(\mathbf{x}) \\ & \text{time}(\mathbf{x}) \\ & \text{cost}(\mathbf{x}) \end{aligned}$$

# What is Project Management?

**Definition: Project Management**

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

# Project Management Framework

The project management framework can be broken down in two ways: by **Process Groups**, or by **Knowledge Areas**. There are 5 different **process groups**, and 10 different **knowledge areas**.

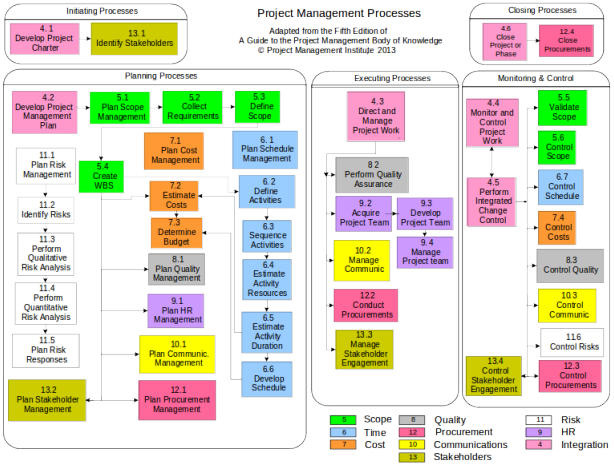
## Definition: **Process Groups**

1. Initiating
2. Planning
3. Executing
4. Monitoring and controlling
5. Closing

## Definition: **Knowledge Areas**

1. Integration
2. Scope
3. Time
4. Cost
5. Quality
6. Human resource
7. Communication
8. Risk
9. Procurement
10. Stakeholder management

# Project Management Framework



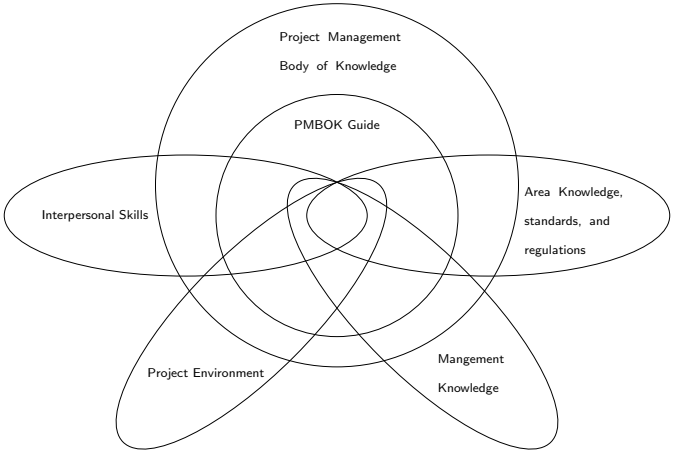
# Five Areas of Expertise

To undertake any project you need human labour. Different people have different skill sets. The project management framework categorises these skills into 5 main categories:

**Definition: Areas of Expertise**

1. PMBOK
2. Area knowledge, standards, and regulations
3. Project Environment
4. Management skills
5. Interpersonal skills

# Five Areas of Expertise



# Five Areas of Experise

**Application area knowledge, standards, and regulations**

This area of expertise can be broken down into the following sub-categories:

- Functional - legal, marketing
- Technical - software, engineering
- Management Specialisation - government, community, development
- Industry Groups - automotive, finance

## International Organisation Standardisation (ISO)

Standards - established by concensus
Regulation - government imposed

**Project Environment**

- Cultural and social environment
- International and political environment
- Physical environment

# Five Areas of Experise

## Management Knowledge and Skills


- Planning
- Organising
- Staffing
- Executing
- Controlling operations

## Interpersonal Skills

- Effective communication
- Influencing organisation - getting things done
- Leadership - vision and strategy
- Motivation - energise, overcome obstacles
- Negotiation and conflict management
- Problem solving

# Project Life Cycle

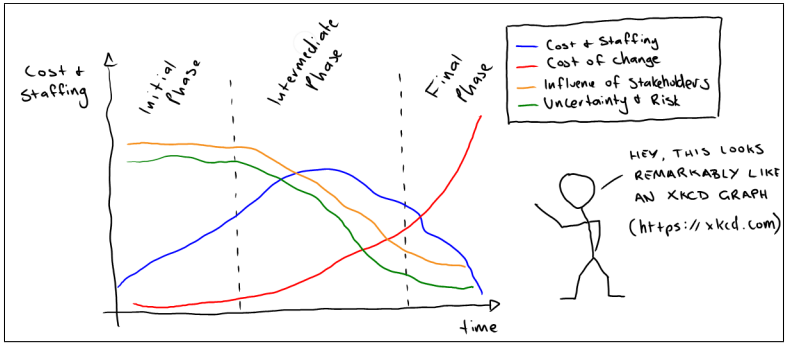



Figure: Graph shows how cost, uncertainty, cost of change, and influence of stakeholders changes over the project life cycle.

# Project Phases

Often, especially for larger projects which have extended duration, it is useful to break the project up into phases. Typically, the completion of one or more deliverables signifies a project phase.

## Definition: **Deliverable**

A **deliverable** is defined as a measurable, verifiable work product. Some examples include:

- Specification
- Feasibility study
- Design document
- Prototype

# Project Stakeholders

## Definition: **Stakeholders**

**Stakeholders** are the individuals and/or organisations that are actively involved in the project, or whose interests may be affected as a result of project execution or project completion.

Some examples of stakeholders include:

- The project sponsor
- The project manager
- The project team
- Support staff
- Customers
- Suppliers
- Opponents to the project

Anybody affected by the planned project can constitute as a stakeholder - it's just the level of influence that is relevant.

# Project Stakeholders

**Definition: Positive Stakeholder**

A **positive stakeholder** is a stakeholder which benefits from the project's success

**Definition: Negative Stakeholder**

A **negative stakeholder** is a stakeholder which is disadvantaged by the project's success.

# Organisational Influences

Organisational culture has a direct influence on the project, for example:

- An aggressively entrepreneurial environment my be conducive to high-risk projects.
- An authoritarian environment may not be conducive to participative approaches.

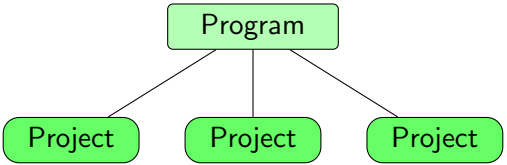
# What is a Program?

## Definition: **Program**

A **program** is a group of related projects managed ina coordinated way to obtain benefits and control not available from managing them individually.

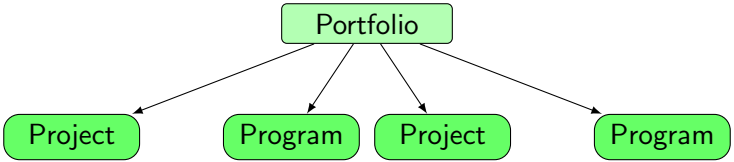
## Definition: **Program Manager**

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



## Definition: **Project Portfolio Management**

**Project portfolio management** is an emerging business strategy in which organisations group and manage projects and programs as a portfolio of investments that contribute to the entire enterprise's success.



# Project Management Compared to Portfolio Management

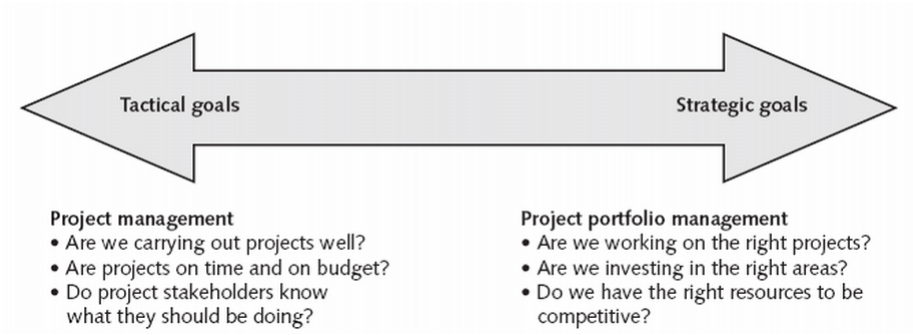



Figure: The figure shows the differences between project management and program management.

# The End