# Project management

## Introduction

The material covered this week can all be found in chapters 1-10 of Wysocki's book, "[Effective Project Management: Traditional, Agile, and Extreme](http://site.ebrary.com/lib/universityofessex/reader.action?docID=10814451)". It is not necessary to read all the chapters in one go but to use it as a reference book. When you want to know a particular topic in more detail you can did into the book and read about that particular topic. Where I give page numbers as references it is to pages in Wysocki's book.

## What is a project?

A project is a set of interconnecting activities which must be completed by an agreed time, at an agreed cost/budget, to an agreed specification. The activities will together deliver an overall outcome and will take some time to complete.

A project can be defined by a set of parameters. We will use the parameters;

Scope: The scope is agreed with the customer. It is an agreement on what is to be done and perhaps what will not be done. The scope is usually captured in a document.

Quality: The quality of what is to be delivered has to be agreed. Will it be a budget product or a high end product?

Cost: What will be the costs including all elements of the project (workers/clients time, materials, etc.)?

Time: What is to be delivered and by when?

Resources: What is needed to deliver the outcome such as people, equipment, materials, services....?

### Wysocki’s scope triangle

Managing a project involves monitoring overall progress taking into account all the aspects of the scope triangle. There will be pitfalls such as delays, cost overruns, lack of resources, the customer wanting more for less.



Figure 1 – Wysocki’s Triangle [Online, 2018] Source: <https://www.projecttimes.com/articles/viewing-the-prince2-project-as-a-system-in-balance-using-the-ecpm-scope-triangle.html>

## Project planning

Everyone undertakes project management to a lesser or greater degree. For short term jobs most people are familiar with "to do" lists. However project planning requires more than a "to do" list and in many cases will have a project manager. A programme, which is a very large endeavour, will require a programme manager who will oversee the work of many project managers running a set of related projects, for example in the case of developing the Airbus.

<https://youtu.be/vlqGxskcdiE>

## Project characteristics

A project can be described using a number of characteristics. We will use the following set.

* Size/cost: investment of money and people
* Importance: mission critical
* Duration: critical time window
* Complexity: across Departments, organisations, countries
* Technology: is it off the shelf or breaking new ground?
* Risk: what if?

## Project processes

A project can be broken down into a number of processes from project beginning to project end. Here is a set of processes.

* Scoping: Identify stakeholders, agreement on goals, specifications, approval to plan
* Planning: Agreeing what needs to be done and by when, and at what cost. Producing a project plan and assessing risks.
* Launching: Recruiting and building the team. Establishing roles and responsibilities and means of communication.
* Monitoring and controlling: monitoring the project, addressing problems, agreeing changes, keeping everyone informed.
* Closing: Checking conformance to the goals and specifications, delivering the product and signing it off.

## Project management knowledge areas

The following 10 management knowledge areas can be mapped onto the project processes.

* Integration Management
* Scope Management
* Time management
* Cost Management
* Quality Management
* Human resources Management
* Communications Management
* Risk Management
* Procurement Management
* Stakeholder Management

## Spotlight on scoping

Scoping is the first project process listed above. At this stage it is important to understand client expectations, gather the requirements, and produce a specification. You may produce early prototypes, establish a business case and develop a project overview including a project description, establishing procurement and subcontracting, and developing the proposal into a project plan.

## Working with clients

Clients will hopefully always be good clients. Good clients will know what they want, know when they want it. They will be involved in the project to develop the product. Not so good clients will not know what they want, will change their minds often, will not want to be involved, will be hard to please, and will not be interested in solving "your" problems. Your early interaction with clients will be about capturing the requirements. The following cartoon illustrates product development and what can go wrong if requirements are not captured clearly.

<https://youtu.be/0YBMfTorE6A>

## Gathering requirements

You can gather requirements by interviewing the client, holding brain-storming sessions, visiting the client to better understand their needs and their business processes. You can develop prototypes, use cases, and prepare scoping documents and or diagrams. The process can also be formalised by creating a Requirements Breakdown Structure (RBS - Wysocki’s chapter 4) in which you decompose top level requirements into component functions, for example R1= a+b+c. it is important to note that you need to be able to verify your product against requirements so at this stage you need to think about how you will verify that requirements are met. Are they feasible, measurable, and testable? Will the requirements lead to a product that has maintainability, reliability, stability, and good performance? What are the health & safety, and legal aspects of the product?

## Product overview statement

The product overview is a statement of the problem which is the foundation on which the project t is based. There should be a project goal which states what is going to be done. There should be project objectives listing a number of key outputs/achievements. You should indicate the success criteria and any risks, assumptions, or obstacles to achieving the project goals.

## Why we plan?

You might be thinking at this stage that this all sounds like a lot of work and will it really benefit the product to be developed. In other words why do we plan? The answer is that we plan to reduce uncertainty by communicating about the project. Planning increases understanding and is a means of setting a common direction. Planning also improves efficiency and identifies a common path. The following 'PAIN' curve indicates the pain in relation to good and poor planning. What does it tell us?

## Planning tools

There are many different types of planning tools that you perhaps already use or can use when undertaking project planning and management. These range from sticky notes which give an easy and fast way of providing structure and insight into a project. By using a range of coloured notes you can add immediate visual impact. How might you use colours? You can also use a white board and coloured marker pens in combination with sticky notes, providing added dimensions to the visualisation of the planning and management of the project. You can show use a range of software tools such as Microsoft Project (waterfall) and PlanBox (Agile).

**How much time should be spent on planning a project?** - The answer to this question depends on the size of the project. What is important is that time is taken to discuss and agree requirements. This is followed by identifying the tasks to be undertaken to achieve these requirements. Task requires task owners and the availability of required resources needs checking. A schedule of agreed activities and deliverables must be established with the identification of milestones. A decision has to be taken regarding the reporting of the project progress. All these issues must be agreed as the 'plan'. Large projects may need dot go through this process a number of times.

**Gantt charts** - These charts were designed by Henry Gantt in around 1910-15. They are used to plan, schedule and monitor project progress. You can build them in Microsoft Excel but it is far better to use Microsoft Project which is available in the labs. All team members should watch the following video and be ready to help create a team Gantt chart in the week 9 lab team meeting.

**Work Breakdown Structure (WBS)** - A work breakdown structure breaks the work to be undertaken to achieve the project goals into a set of functions, sub-functions, and activities. The following videos offer further explanation.

<https://youtu.be/oOsiPELtW2A>

<https://youtu.be/ctBMZu8seGE>

**Monitoring tools** - Monitoring the progress of a project is very important. It can be achieved through written reports (current period, cumulative, exception, stoplight, and variance). Monitoring can be achieved through the use of the Gantt charts and milestone charts. You can produce cost/spend reports, hold project status meetings, and adopt problem escalation strategies.

## Risk management

### ****Defining risks****

A risk is defined as an event that might happen and in so doing change the achievement of objectives. A risk may have the potential for negative impact (i.e. a threat) or positive impact (an opportunity). A risk is expressed as the combination of the chance of an event and its consequences. If a risk event happens, the status of the risk changes to "triggered" or is considered an "Issue". If a risk was around it snowing today and it had happened that would be moved from a risk to an issue. The following diagram illustrates a standard risk management process.

### ****Risk roles and responsibilities****

There are four characters identified in a risk management process. They are the risk originator, the project manager, the risk owner, and the response owner. Their roles are as follows.

**Risk originator**: The person who first identifies the possible risk.

**Project manager**: The project manager will be the most affected by the risk and is therefore the most motivated to use budget and resources to control the risk. The project manager validates the supplied information, approves the risk entry, and reviews and manages the activities to control the entry. The project manager ensures that the assessment of the risk is up to date.

**Risk owner**: This person is appointed by the project manager to manage the risk. The owner is charged with providing assessments and for formulating an appropriate plan to control the entered item, including planning response tasks for others.

**Response owner**: This person is charged with executing a specific task specified within the mitigation plan or fall-back plan, and reporting progress made towards the completion of the task.

**Ten golden rules of risk management**

* Rule 1: Make risk management part of your project.
* Rule 2: Identify risks early in your project.
* Rule 3: Communicate about risks.
* Rule 4: Consider both threats and opportunities.
* Rule 5: Clarify ownership issues.
* Rule 6: Prioritise risks.
* Rule 7: Analyse risks.
* Rule 8: Plan and implement risk responses.
* Rule 9: Register project risk.
* Rule 10: Track risks and associated tasks

**Risk quantification**

All risks can be quantified using two measures, probability, and impact. We ask what the probability of the risk becoming an issue is and what would be the impact if it became an issue?

## Project closure

A project is closed when the client tests and verifies the conformance of the product developed using an agreed testing methodology. There will often be a formal client sign-off, acceptance and final payment. There will also often be final documentation and archiving procedures.

## Project management methodologies

As we have seen when we discussed product development there are a number of methodologies that can be used. We are using the traditional, or waterfall methodology. There are four main types identified at present and they are;

* Traditional (Waterfall)
* Extreme
* Agile
* Emertxe

In the product development lecture I introduced the Scrum approach to agile methodology. The following video gives a good introduction to Agile Scrum.

<https://youtu.be/XU0llRltyFM>

## Project failure

Projects fail for a variety of reasons. Here are a few causes. You might be able to think of others, or experience them in your teams.

**Some causes**

* Requirements definition - poor, inadequate, too complex
* Lack of decision making
* Lag between estimate and kick-off too great
* Change: e.g. project resources/time cut
* Poor estimates or planning
* Lack of staff resources / conflicts
* Scope too big

**Solutions**: - PREVENTION and/or INTERVENTION

**Prevention**

* Planning
* Monitor and report
* Risk management
* Change processes
* Review processes

**Intervention**

* Client involvement
* Root cause analysis (read on this topic, Wysocki pgs. 578-579)

**Project revising**

If a project is failing it may be able to be rescued through a revision of the plan. It is crucial to have client engagement, to consider stopping altogether although there may be real costs to failure.

# Using Microsoft Project

<https://youtu.be/sSS1tu1yQ-Q>