

Software Project Management

Bob Hughes and Mike Cotterell

Fifth Edition

Software Project Management

Chapter One

Outline of talk

In this introduction the main questions to be addressed will be:

- **What is software project management?** Is it really different from 'ordinary' project management?
- **How do you know when a project has been successful?**
For example, do the expectations of the customer/client match those of the developers?



Why is Project Management Important?

➤ *innovación, desarrollo y demás desgracias.*

- Large amounts of money are spent on ICT (Information and Communications Technology) e.g. UK government in 2003-4 spent £2.3 billions on contracts for ICT and only £1.4 billions on road building
➤ *1/3 son exitosos en cuanto coste/producción.*
- **Project often fail**, Standish Group claim only a third of ICT projects are successful, 82% were late and 43% exceeded their budget
- **Poor project management a major factor in these failures** e.g. lack of skills and proven approach to project and risk management

What is a Project?

Pasos a seguir para un objetivo...

Some dictionary definitions:

- *"A specific plan or design"*
- *"A planned undertaking"*
- *"A large undertaking e.g. a public works scheme"*
(Longmans dictionary)

Key points above are *planning* and *size of task*

que cosas hay que hacer
y en que orden, con unas fechas
determinadas → Control para Cumplimiento.

Limitaciones

- tiempo
- coste
- recursos

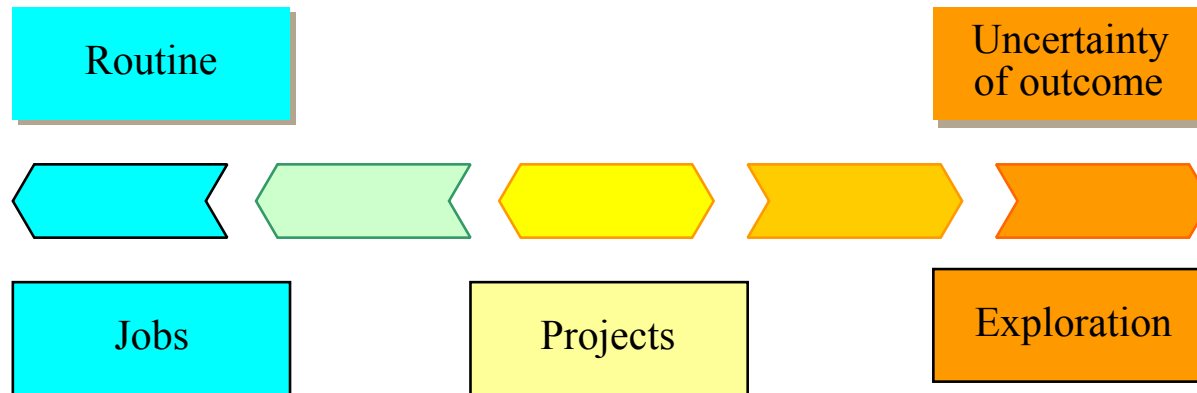
BSO ISO 10006 (1997)

'Unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost and resources'

Jobs versus Projects

No todo es un proyecto.

Trabajo vs proyecto vs exploración.



- **Jobs** - repetition of very *well-defined* and well understood tasks with very little uncertainty
→ Tarea Repetitiva ... → desmontar un auto. sabe como hacerlo y tiene el tiempo etc. No hay incertidumbre. → Es rutina.
- **Exploration** - e.g. finding a cure for cancer, the outcome is very *uncertain*
- **Projects** - in the middle! *→ Algo que está entre medio ... Planificación con incertidumbre*
→ Puede llevar al éxito o fracaso.

Characteristics of Projects

A task is more 'project-like' if it is:

- Non-routine *Con tareas NO rutinarias.*
- Planned *Planificado.*
- Aiming at a specific target *Con unos objetivos específicos.*
- Carried out for a customer *El proyecto no es para ti, es para otro.*
- Carried out by a temporary work group *Con un grupo temporal.*
- Involving several specialisms *Se lleva a cabo con un equipo especializado para ese proyecto.*
- Made up of several different phases *diferentes fases...*
- Constrained by time and resources *tiempo-recursos.*
- Large and/or complex

Exercise 1.1

Consider the following. Some seems more like projects than others. Put them into an order most closely matching your ideas of what constitute a project.

- Producing an edition of a newspaper *→ Task Repetitive → No project.*
- Putting a robot vehicle on Mars to search for signs of life
- Getting married
- Amending a financial computer system to deal with a common European currency
- A research project into what makes a good human-computer interface
- An investigation into the reason why a user has a problem with a computer system
- A second-year programming assignment for a computing student
- Writing an operating system for a new computer
- Installing a new version of a word processing package in an organization

Are Software Projects really Different from other Projects?

Not really ... but

- Invisibility
- Complexity
- Conformity
- Flexibility

*Es diferente el software a dar
demás?
Es el arte de hacer visible lo imposible
↳ desarrollo software.*

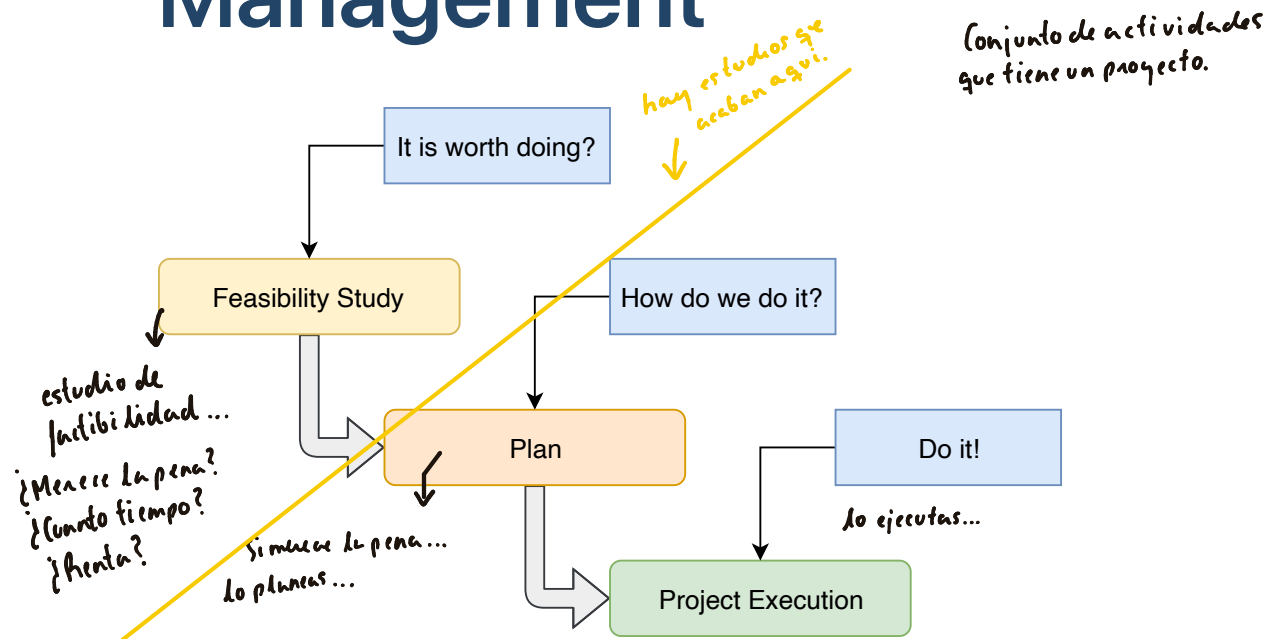
make software more problematic to build than other engineered artefacts

Contract Management vs Technical Project Management

Projects can be:

- misma empresa
mismo proyecto* • **In-house:** clients and developers are employed by the same organization
- diferentes
empresas, un
mismo proyecto* • **Out-sourced:** clients and developers employed by different organizations
- 'Project manager' could be:
 - a 'contract manager' in the client organization
 - a technical project manager in the supplier/services organization

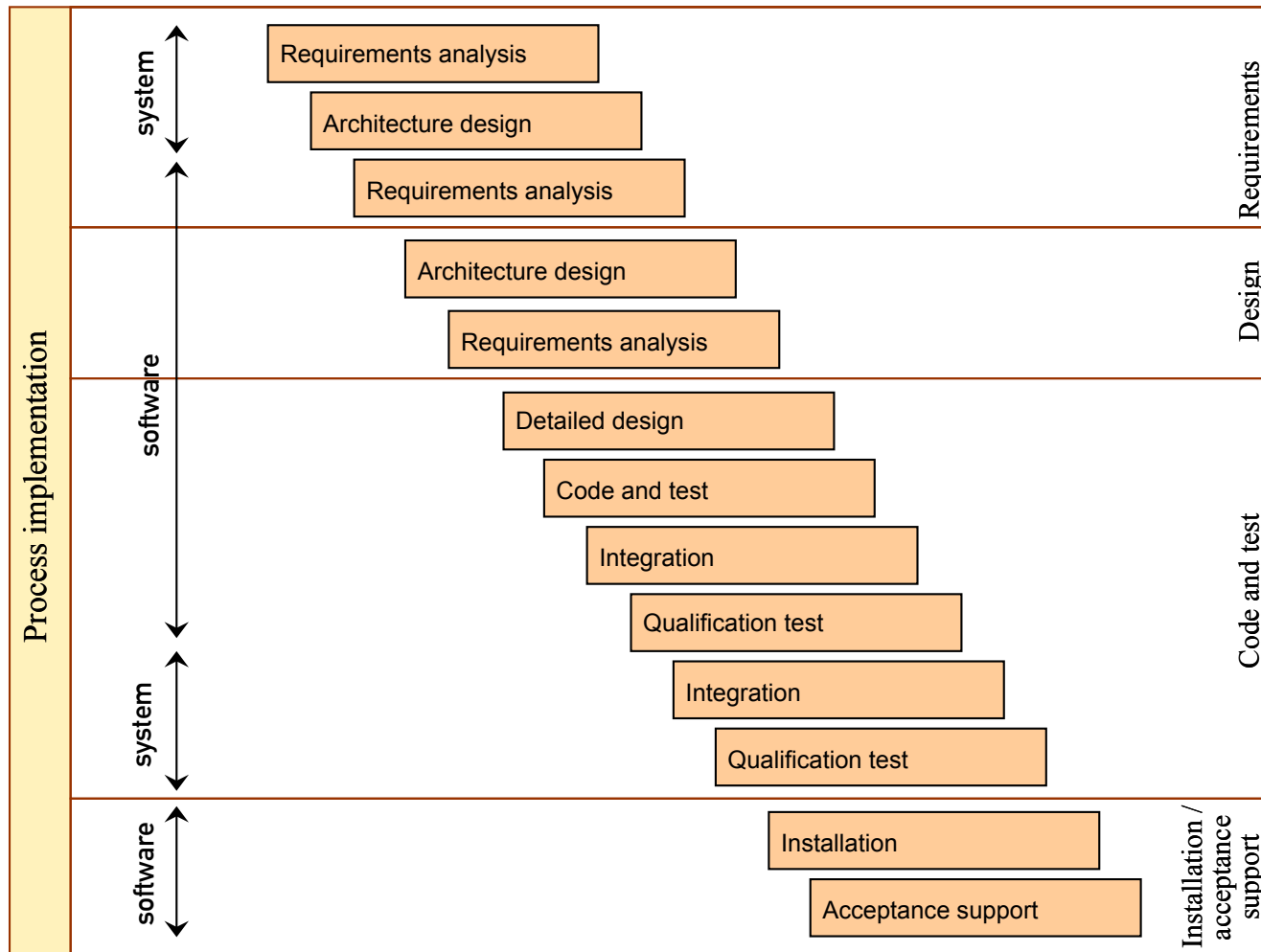
Activities Covered by Project Management



1. **Feasibility study:** Is project technically feasible and worthwhile from a business point of view?
2. **Planning:** Only done if project is feasible
3. **Execution:** Implement plan, but plan may be changed as we go along

The Software Development Life-Cycle (ISO 12207)

Ciclo de vida Software...



ISO 12207 Life-Cycle

- Requirements analysis *elicitación requisitos... / fuente costes etc...*
 - Requirements elicitation: what does the client need?
 - Analysis: converting 'customer-facing' requirements into equivalents that developers can understand
 - Requirements will cover coste - asequible?
 - Functions
 - Quality
 - Resource constraints i.e. costs

*Traducir lo que dice este
men hacia el código.*

ISO 12207 Life-Cycle (ii)

- Architecture design *don de lo monto, cómo lo montaría.*
 - Based on *system requirements*
 - Defines components of system: hardware, software, organizational
 - *Software requirements* will come out of this
- Code and test *prueba esos componentes a ver si funciona eso... e implementa el código en la arquitectura propuesta.*
 - Of individual components
- Integration
 - Putting the components together

ISO 12207 Life-Cycle (iii)

- Qualification testing *testea el code*
 - Testing the *system* (not just the *software*)
- Installation *despliegue...*
 - The process of making the system operational
 - Includes setting up standing data, setting system parameters, installing on operational hardware platforms, user training, etc
- Acceptance support
 - Including maintenance and enhancement

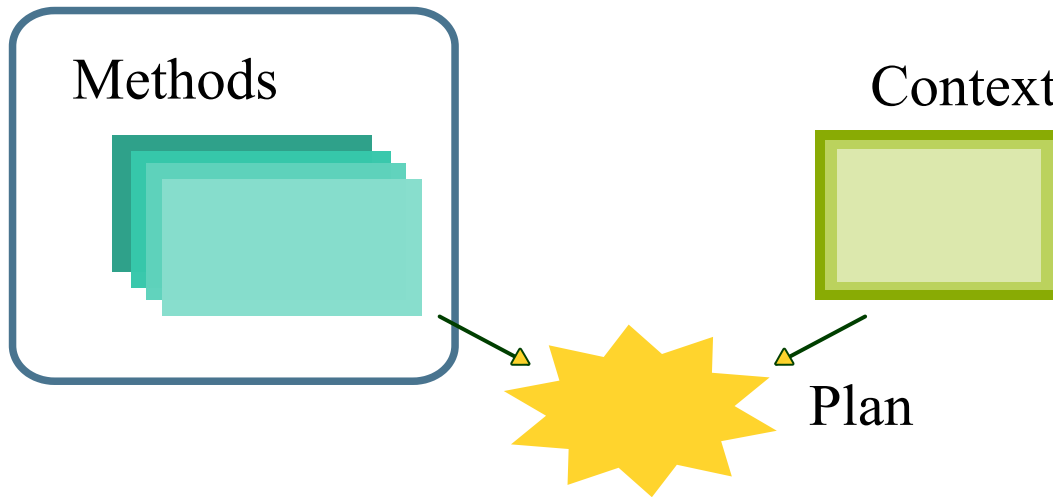
Exercise 1.2

Brightmouth College is thinking about to do the payroll itself using a off-the-shelf package instead to pay for this service to the local authority.

- What would be the main stages of the project to convert to independent payroll processing by the college?

Bearing in mind that an off-the-shelf package is to be used, how would this project differ from one where the software was to be written from scratch?

Plans, Methods and Methodologies



- **Methodology** = a set of methods
- **Method** = a way of working
- **Plan** = methods + start and end dates for each activity, staffing, tools and materials, etc.

Exercise 1.3

In groups of four, work out how you would obtain an accurate estimate of the wide of the building.

Once the planning is complete, implement your plan, timing how long it takes to produce your final figure.

¿Cómo categorizamos los proyectos?

Some Ways of Categorizing Projects

Distinguishing different types of project is important as different types of task need different project approaches e.g.

- Voluntary systems (such as computer games) versus compulsory systems e.g. the order processing system in an organization

Si son obligatorios... El ejemplo de una tienda de usar. o si son voluntarios como un videojuego...

sistemas informacion. vs sistemas embebidos.

- Information systems versus embedded systems
- Objective-based versus product-based

a Objetivos o a productos.

Compulsory vs Voluntary Users

- In workplaces, the users **have to** use a system if they want to do something
- In the case of computer games, it's use is increasingly **voluntary**
- More difficult to elicit precise requirements from potential users than from compulsory users
 - Market surveys, focus groups and prototype evaluation

Information Systems vs Embedded Systems

- **Information systems** enable staff to carry out office processes
- **Embedded systems** control machines

Ex. 1.4 - Would an operating system on a computer be an information system or an embedded system?

Objectives vs Products

- Projects can be distinguished by whether their ^{o objetivo} aim ^{apuntar} is to produce a **product** or to ^{conocer} meet certain **objectives**
 - If to produce a product, it will be strictly defined by clients
 - If to meet an objective or to address a problem, there is more freedom to select the most appropriate approach
- Two stages, first an objective-driven project might identify the need of a product, then an product-driven project to develop it

Exercise 1.5

Would the project to implement an independent payroll system at the Brightmouth College be an objective-driven project or a product-driven one?

Stakeholders

El que tiene el palo. El que tiene el interés.

El que tiene que decir algo en el proyecto... clientes, desarrolladores...

- These are people who have a stake or interest in the project
- In general, they could be *users/clients* or *developers/implementers*
- They could be:
 - Within the project team *→ dentro del equipo.*
 - Outside the project team, but within the same organization *fuera equipo... dentro de la organización.*
 - Outside both the project team and the organization *fuera equipo y organización... clientes...*
- Different stakeholders may have different objectives – need to define common project objectives

gente dentro del proyecto puede tener diferentes objetivos... mas plantilla... más amigable...

Exercise 1.6

Identify the stakeholders in the Brightmouth College payroll project

Setting Objectives

Como definiamos los objetivos del proyecto... No son tareas ... son como las postcondiciones como metas.

- Answering the question *'What do we have to do to have a success?'*
- Need for a *project authority*
 - Sets the project scope
 - Allocates/approves costs
- Could be one person – or a group
 - Project Board
 - Project Management Board
 - Steering committee

*Sea un éxito si ... hacemos etc
NO como lo hacemos...*

quien lleva esto...

Objectives

deben determinar el éxito.

Si se cumplen objetivos → Éxito... me da igual el cómo.

- *Informally*, the objective of a project can be defined by completing the statement:
 - *The project will be regarded as a success if ...*
- Rather like *post-conditions* for the project
- Focus on *what* will be put in place, rather than *how* activities will be carried out

Objectives should be SMART

Objetivos deben ser:

Concreto

- **Specific**, that is, concrete and well-defined

medibles No puedes adelgazar sin comer...

- **Measurable**, that is, satisfaction of the objective can be objectively judged

archivable ¿?

- **Achievable**, that is, it is within the power of the individual or group concerned to meet the target

Relevante

Objetivos se fenzan se ven con el proyecto.

- **Relevant**, the objective must relevant to the true purpose of the project

Tiempo

- **Time** constrained: there is defined point in time by which the objective should be achieved

Goals/Sub-objectives

Objetivos demasiado grandes y debemos dividirlos en subobjetivos.

- These are steps along the way to achieving the objective
- Informally, these can be defined by completing the sentence
- To reach objective X, the following must be in place
 - A ... *Cada uno tiene una meta dentro de todo objetivo*
 - B ... *Un subobjetivo → Meta.*
 - C ... *Un equipo futbol Objetivo.. meta de cada jugador...*
 - etc

Goals/Sub-objectives (ii)

- Often a goal can be allocated to an individual
- Individual might have the capability of achieving goal on their own, but not the overall objective e.g.
 - *Overall objective* – user satisfaction with software product
 - *Analyst goal* – accurate requirements
 - *Developer goal* – reliable software

Para un analista un objetivo es elicitar bien los requisitos.

↳ para este... hacen bien

pero todos van en esa dirección.

Exercise 1.7

Bearing in mind the above discussion of objectives, comment on the appropriateness of the wording of each of the following 'objectives' for software developers:

1. To implement the new application on time and within budget
2. To implement the new software application with the fewest possible software errors that might lead to operational failures
3. To design a system that is user-friendly
4. To produce full documentation for the new system

Measures of Effectiveness

Como medimos el éxito?

- How do we know that the goal or objective has been achieved?
- By a practical test, that can be objectively assessed. e.g. for user satisfaction with software product:
 - Repeat business – they buy further products from us
 - Number of complaints – if low etc

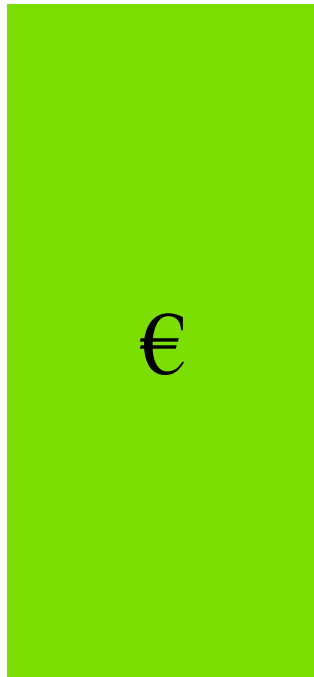
Exercise 1.8

Identify the objectives and sub-objectives on the BCPP.
What measures of effectiveness could be used to check the success in achieving the objectives of the project?

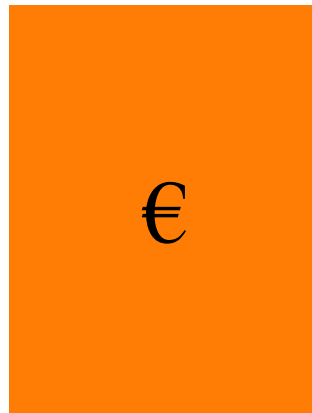
The Business Case

Análisis de Costes...

Benefits



Costs



The Business Case (ii)

Cuando esa aplicación se desmolda, se quita generando gastos...

- Benefits of delivered project must outweigh costs
- Costs include:
 - Development
 - Operation
- Benefits
 - Quantifiable
 - Non-quantifiable

Project Success/Failure

- Degree to which objectives are met

- Time

El grado de consecución de los objetivos determina el grado del éxito.

- Cost

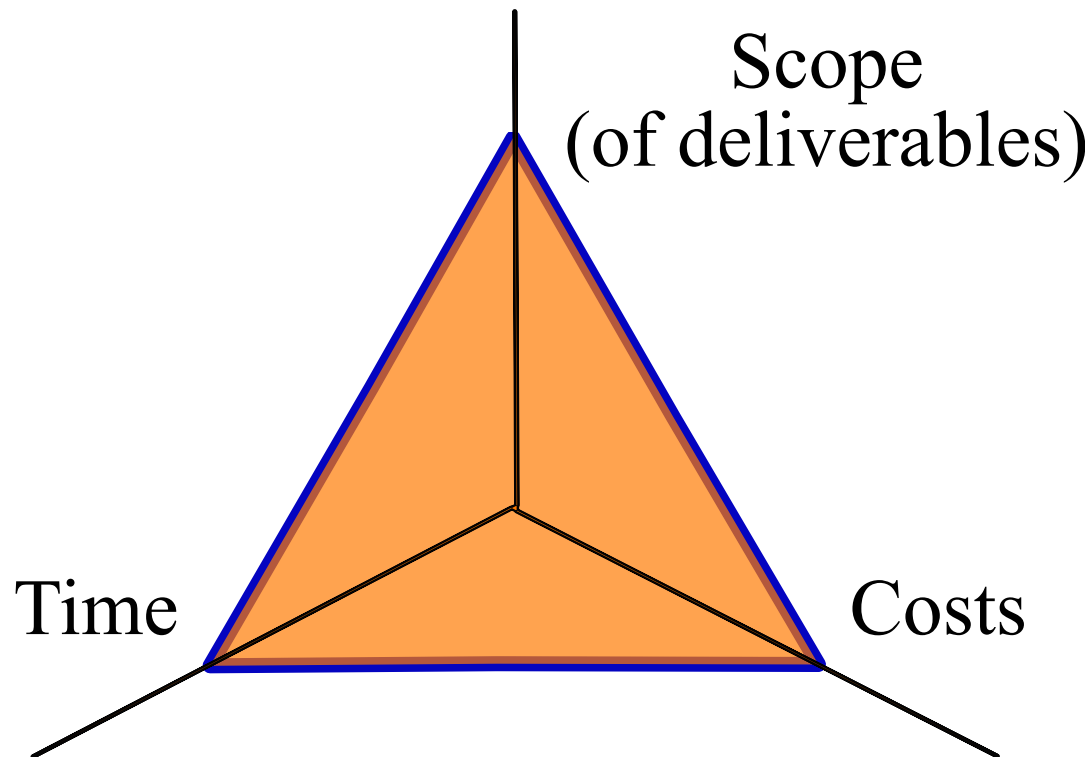
debo alcanzar los objetivos SMART pero que NO se escape el tiempo, el coste...

- Scope (of deliverables)
(alcance).

- In general if, for example, project is running out of time, this can be recovered for by reducing scope or increasing costs
- Similarly costs and scope can be protected by adjusting other corners of the **project triangle**
- **Project objectives and Business objectives**

Objetivos del proyecto están con los objetivos del negocio.

Project Success/Failure (ii)



Other Success Criteria

*Es interesante el proyecto si aprendemos algo...
si desarrollamos cosas que luego nos sirvan para desarrollar → biblioteca.*

- These can relate to longer term, less directly tangible assets
 - Improved skill and knowledge
 - Creation of assets that can be used on future projects
e.g. software libraries
 - Improved customer relationships that lead to repeat business

What is Management?

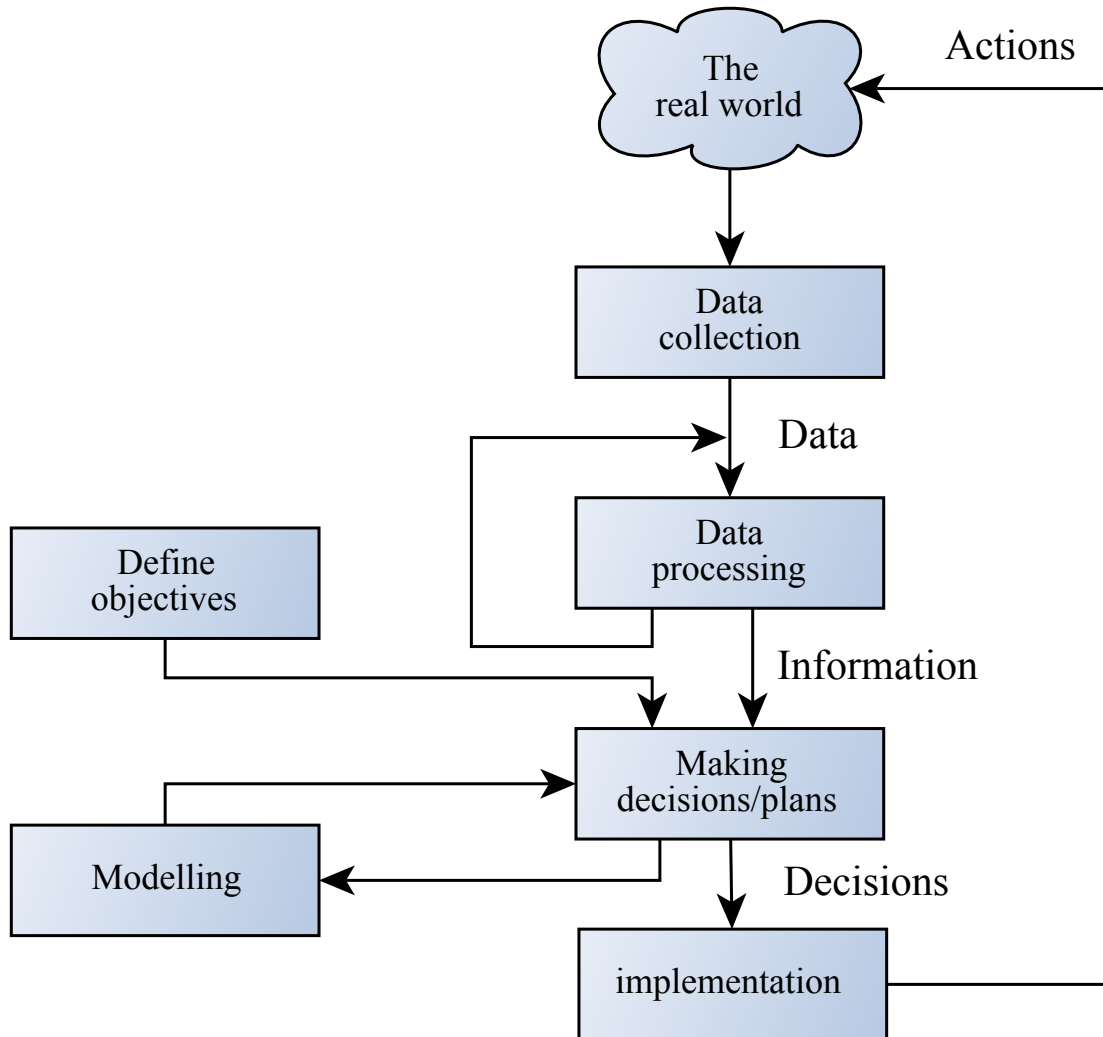
los gestores de proyectos hacen:

- This involves the following activities:
 - **Planning** - deciding what is to be done
 - **Organizing** - making arrangements
 - **Staffing** - selecting the right people for the job
 - **Directing** - giving instructions

What is Management? (ii)

- This involves the following activities:
 - **Monitoring**, checking on progress
 - **Controlling**, taking action to remedy hold-ups
Control Tomen medidas para reconducir el proyecto.
 - **Innovating**, coming up with solutions when problems emerge
innovar ... hacer cosas de manera distinta.
 - **Representing**, liaising with clients, users, developers
and other stakeholders
Representar el proyecto... en relaciones públicas...

Management Control



Management Control

- **Data** – the raw details
 - e.g. *6,000 documents processed at location X*
- **Information** – the data is processed to produce something that is meaningful and useful
 - e.g. *productivity is 100 documents a day*
- **Comparison with objectives/goals**
 - e.g. *we will not meet target of processing all documents by 31st March*

Management Control - continued

- **Modelling** – working out the probable outcomes of various decisions
 - e.g. *if we employ two more staff at location X how quickly can we get the documents processed?*
- **Implementation** – carrying out the remedial actions that have been decided upon

Key Points in Lecture

- Projects are non-routine – thus uncertain
- *↗ No se ve hasta que no se ha acabado.*
The particular problems of projects e.g. lack of visibility
- *↗ tienes claros objetivos ... pero a veces tienes contra tiempo.*
Clear objectives which can be objectively assessed are essential
- Stuff happens. Not usually possible to keep precisely plan – need for control
- Communicate, communicate, communicate!

Annex 1: Content List for a Project Plan

1. Introduction
2. Background: including reference to the business case
3. Project objectives
4. Constraints (could be included with project objectives)
5. Methods
6. Project products: deliverable and intermediate products

Annex 1: Content List for a Project Plan

(ii)

7. Activities to be carried out
8. Resources to be used
9. Risks to the project
10. Management of the project, including
 - Organizational responsibilities
 - Management of quality
 - Configuration management