PROJECT MANAGEMENT

Module 2: Basic aspects of project management

2.1. Integrated project management

Department of Management
Barcelona School of Informatics (FIB)

Integrated project management

1. Introduction to project management
2. Areas of project management and project planning
3. Project phases
4. Basic vocabulary
5. Project documents

1. Introduction to project management

Definitions of the verb "design" (Collins, online edition)

- 1. To work out the structure or form of (something), as by making a sketch, outline, pattern, or plans.
- 2. To plan and make (something) artistically or skilfully.
- 3. tr. To form or conceive in the mind; invent.
- 4. tr. To intend, as for a specific purpose; plan.

1. Introduction to project management

The concept of the verb "design"

- Basic concepts associated with **design**:
  - The concept of an "Idea" → *Imagination*
  - The concept of a "Proposal" → *Choice between alternatives*
  - The concept of a "Plan" → *Organization over time*
  - The concept of "Resources" → *Human and economic resources, among others.*
  - The concept of "Execution" → *Utility of the thing that is designed*
  - The concept of "Project" → *What is a project?*

1. Introduction to project management

The concept of a "project"

- Definitions of **project** (Oxford, online edition):
  - 1. An individual or collaborative enterprise that is carefully planned and designed to achieve a particular aim.
  - 2. A school assignment undertaken by a student or group of students, typically as a long-term task that requires independent research.
  - 3. A proposed or planned undertaking.

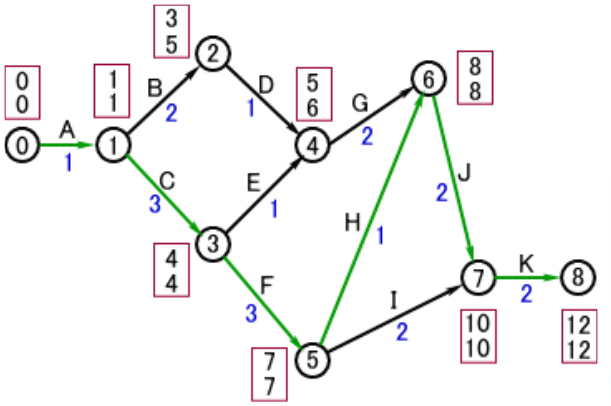
- Classic definition of a "**proyecto**" (Official Gazette of the Spanish Government [BOE], 1967):

> *"A series of documents that define works so that an expert other than the author can use these documents to manage the works and corresponding tasks"*

1. Introduction to project management

The concept of a "project"

- Unique
- A specific objective
- Many stakeholders, interested in its implementation and/or results
- Interrelated activities and tasks
- Limited budget
- One person is in charge
- A Multidisciplinary team: a wide range of resources and abilities



1. Introduction to project management

The concept of a "project"

- Basic concepts associated with a **project**:
  - "Writing" → *Document (ordered)*
  - "Calculation" → *Design, technical knowledge*
  - "Drawing" → *Plan, graphic expression*
  - "What should it be like?" → *Final result*
  - "What should it cost?" → *Budget*
- **Other** basic associated **concepts**:
  - "Background" → *Initial justification*
  - "Location" → *Where?*
  - "Tasks" → *Individual activities*
  - "Safety" → *During execution and use*
  - "Transformation of the environment" → *Impact, environmental effect*
  - "Problem" → *Need to resolve*

1. Introduction to project management

Types of projects

- Depending on the **nature of the need that must be met**:
  - Start / Expansion / Conclusion of the activity
  - Improvement / Change in activity
  - Maintenance of facilities
  - Development of new products
  - Service management
  - Safety / Environmental impact
  - Social / Image / Marketing / others
- Depending on the **nature of the project** itself (disciplines involved):
  - Research - Thesis
  - Software
  - Hardware
  - Viability study. Business plan

1. Introduction to project management

Questions that all projects should answer

Five basic documents in any project

Report

Appendices

Budget

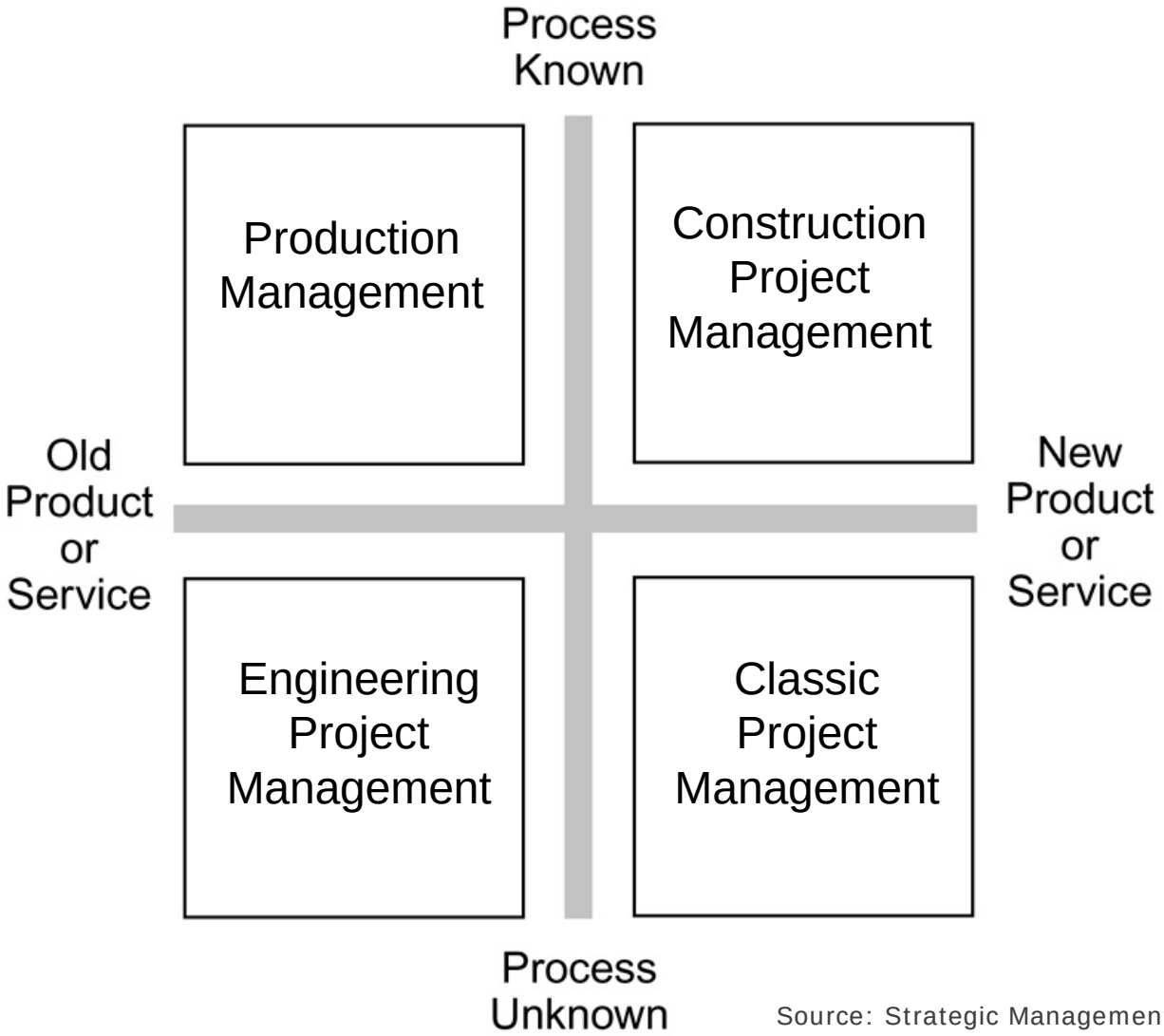
Specifications

Plans

(See Section 1.5)

o Title / Object	*What? Where?*
o Justification and utility	*Why?*
o Scope	*How far?*
o Basic specifications	*Design basis*
o Project development – Alternatives	*How?*
o Project development – Details	*Why?*
o Environmental impact	*Sustainability*
o Regulations and compliance	*Safety*
o Economic viability	*How much?*
o Scheduling – Planning	*Who? When?*
o Conclusions and recommendations	

2. Areas of project management and project planning



Source: Strategic Management Group, Inc. ®

2. Areas of project management and project planning

The idea

- Response to a need (how can it be met?).
- The initial set of ideas should be broad, and then narrowed down to a satisfactory set after a rational selection process. Ideas may be rejected because of technological, economic, financial, environmental and legal factors or because they do not lead to improvements.

2. Areas of project management and project planning

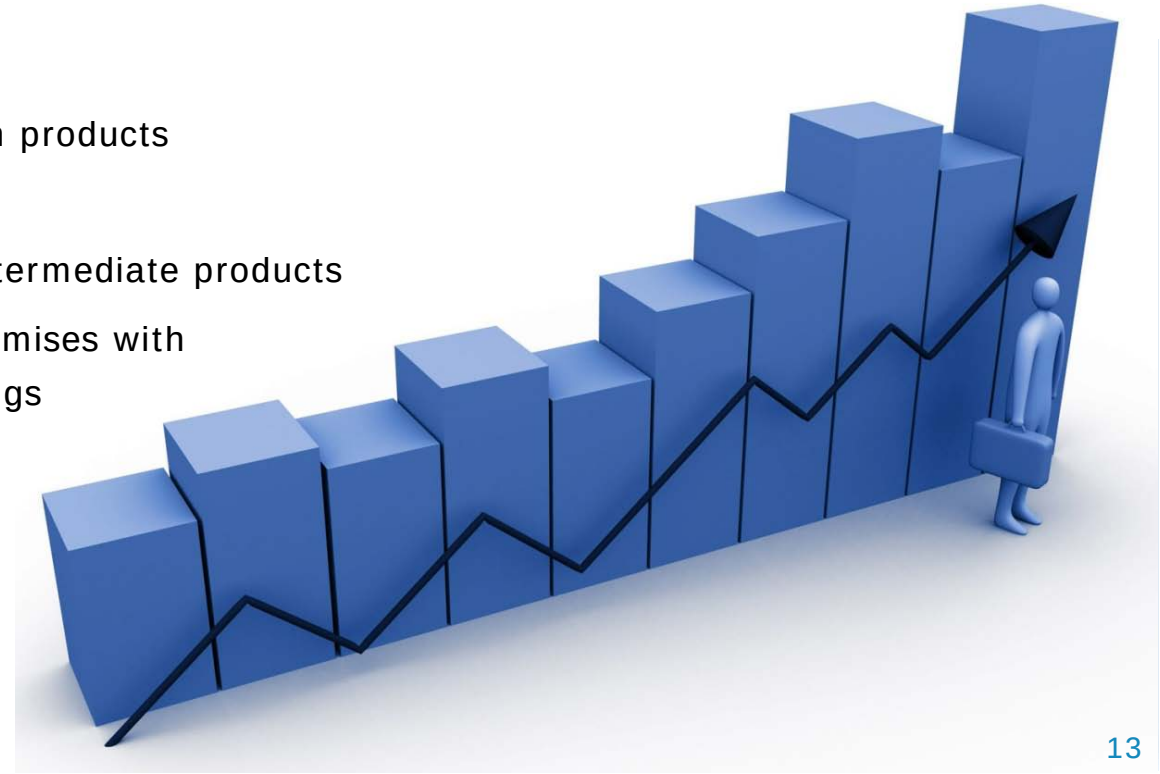
Study of the process

- The aim is to investigate relevant technological alternatives and assess their advantages and disadvantages in relation to the project in question.
- Differences between processes could be related to the following factors:
  - Raw materials used
  - Energy consumption
  - Equipment required
  - Labour requirements
  - Investment, operating and maintenance costs
  - Performance and production capacity
  - Quality of results
  - Environmental impact

2. Areas of project management and project planning

Distribution or layout

- The aim is to optimize the technical systems required to implement the selected process, taking into account the following factors, among others:
  - Maintenance
  - Organization
  - Storage
  - Incompatibilities between products
  - Health risks
  - Transport distances of intermediate products
  - General layout of the premises with respect to the surroundings



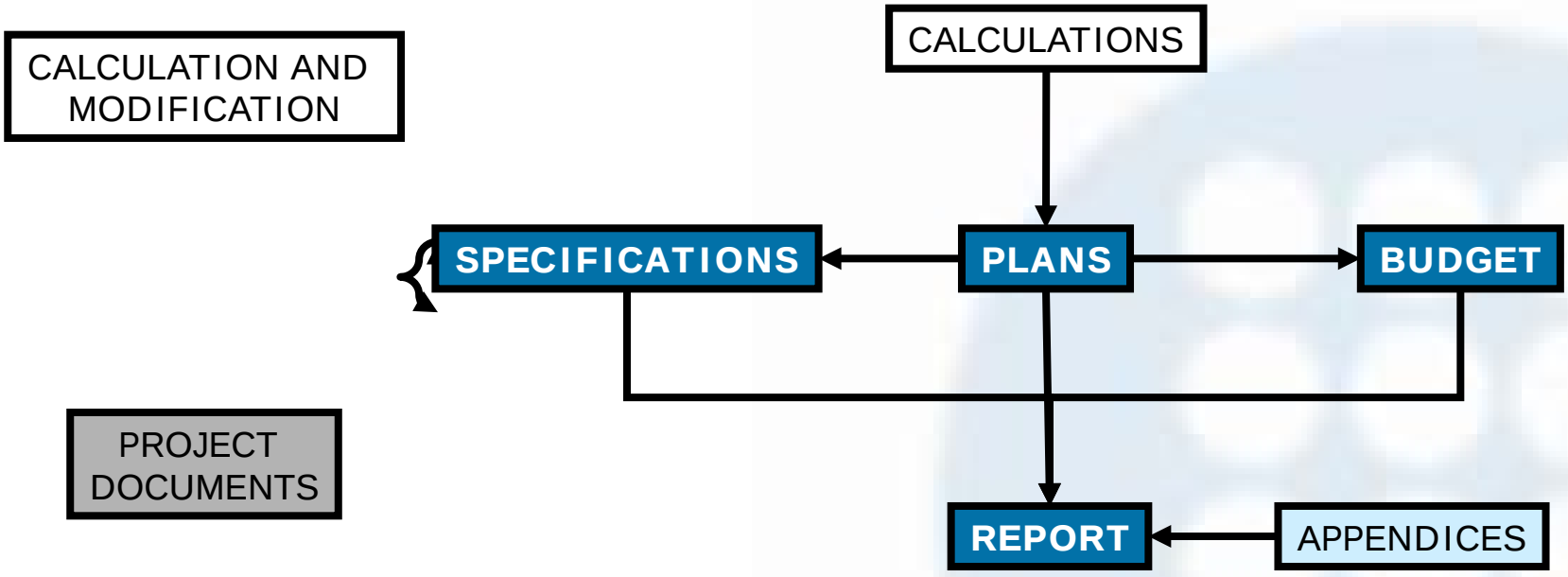
2. Areas of project management and project planning

Data gathering and calculations

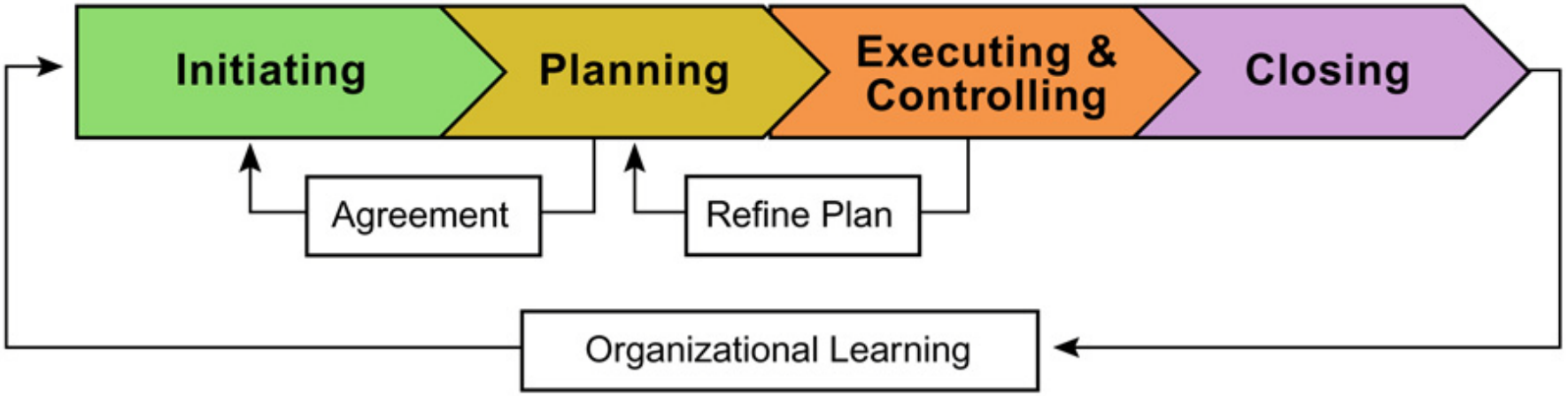
- This phase requires a considerable amount of project management and leadership resources, as well as planning of the various tasks.
- It is the most multidisciplinary phase of the project and that in which the highest volume of human resources is consumed.

2. Areas of project management and project planning

Project / detailed design



3. Project phases



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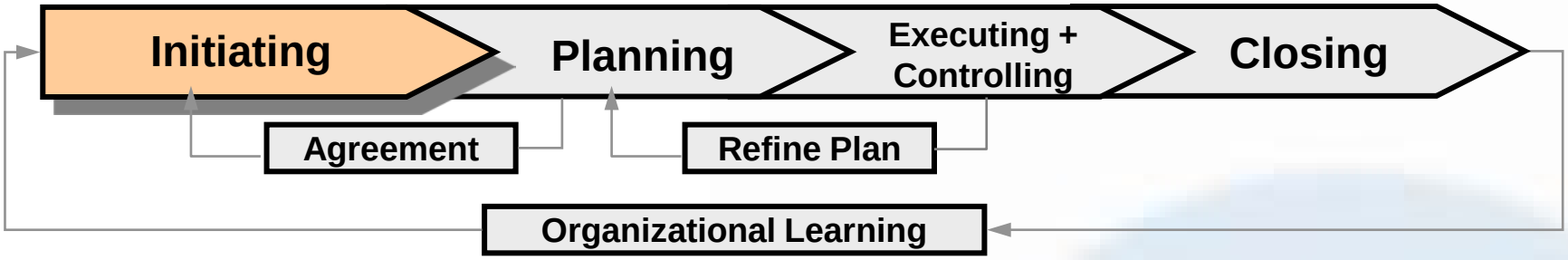
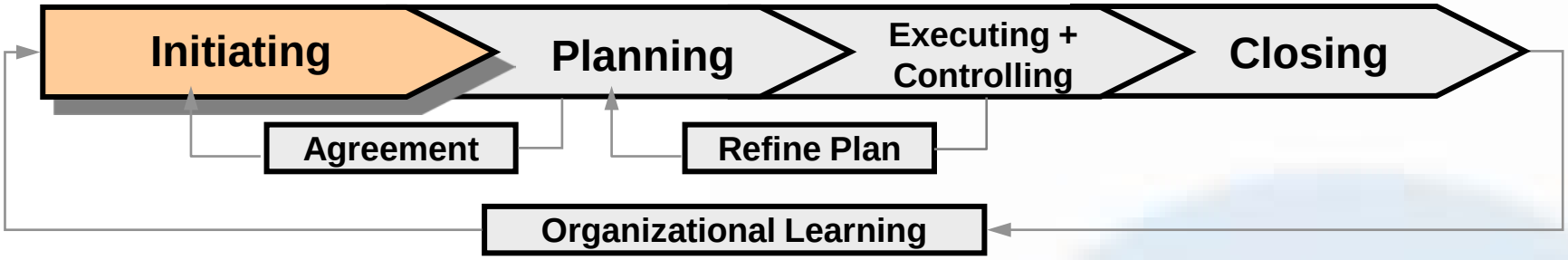
3. Project phases



Source: Strategic Management Group, Inc. ®

- Write a document on the project requirements
- Analyse the situation and study the viability
- Identify the departments that are involved
- Develop assessment criteria
- Select the core project team
- Create a contract for the project
- Hold a kick-off meeting

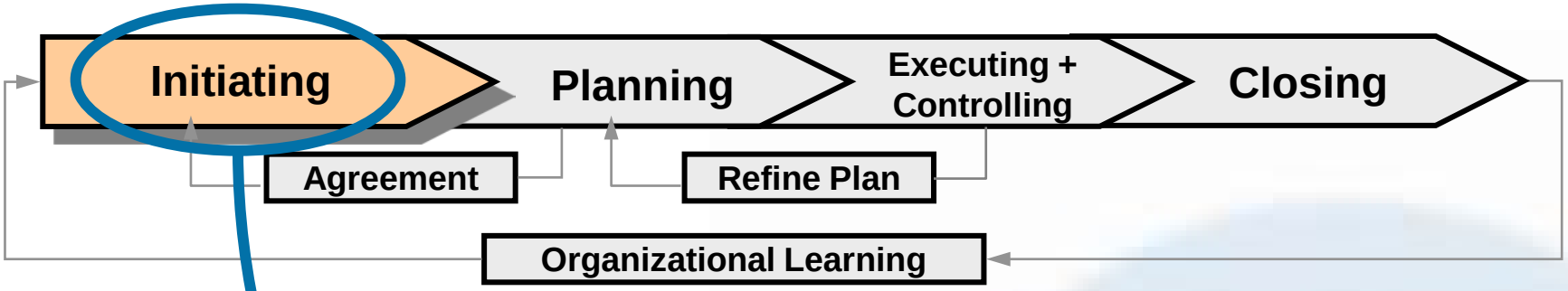
3. Project phases



Source: Strategic Management Group, Inc. ®

- **Required documents**
  - Presentation: describe the perceived need, problem or opportunity
  - Project objectives: describe exactly what the project will achieve
  - Analysis of the situation and study of viability
  - Definition of the project scope, which establishes the limits of the project
  - Description of the features, including details of the final product or service created by the project
  - Assessment criteria for projects

3. Project phases

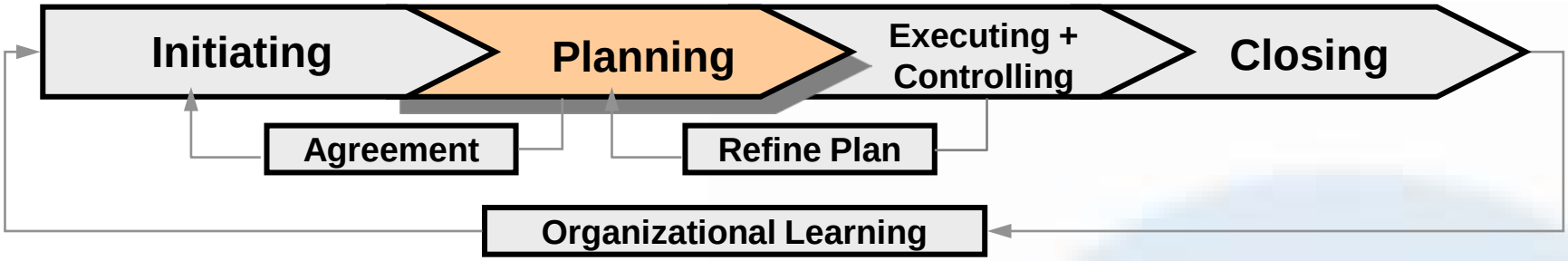


Source: Strategic Management Group, Inc ®

Description of objectives → **SMART**

- **S**pecific
- **M**easurable
- **A**chievable
- **R**ewarding
- **T**ime-Based

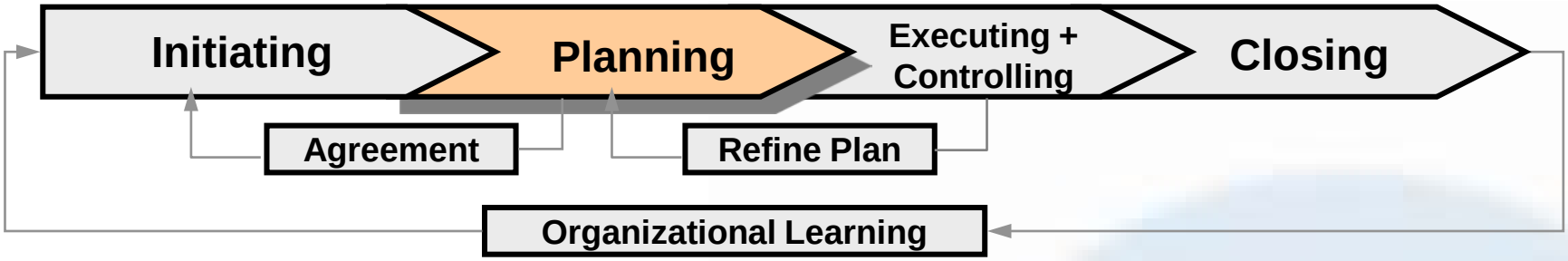
3. Project phases



Source: Strategic Management Group, Inc. ®

- Form the core project team
- Identify the project tasks
- Design a structure for the division of work
- Create a diagram of responsibility
- Draw up a plan for the network of tasks
- Develop an initial project schedule
- Identify the critical path and areas (carry out a risk analysis)

3. Project phases



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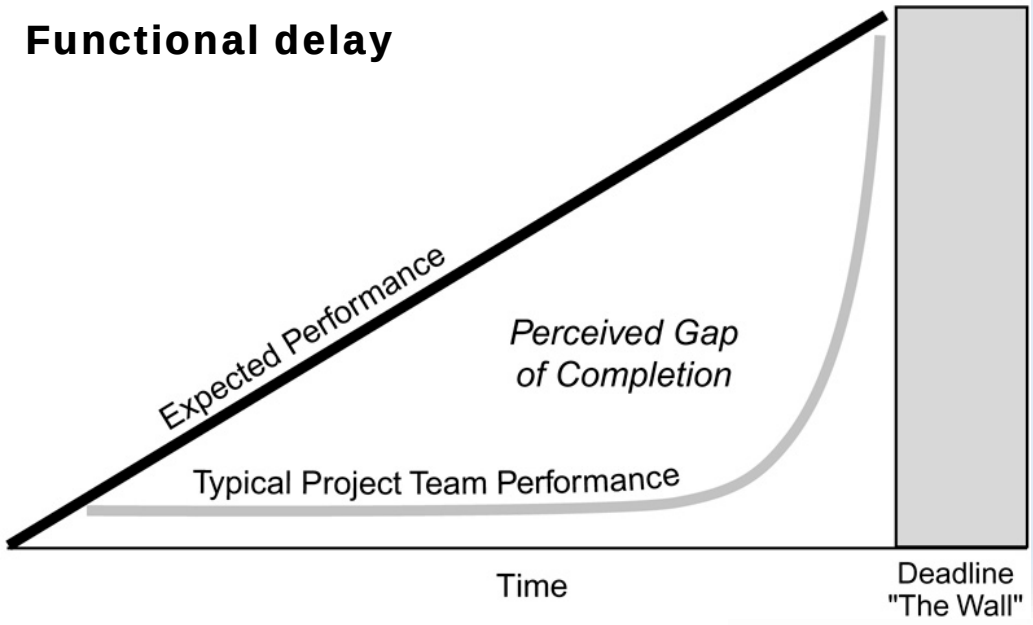
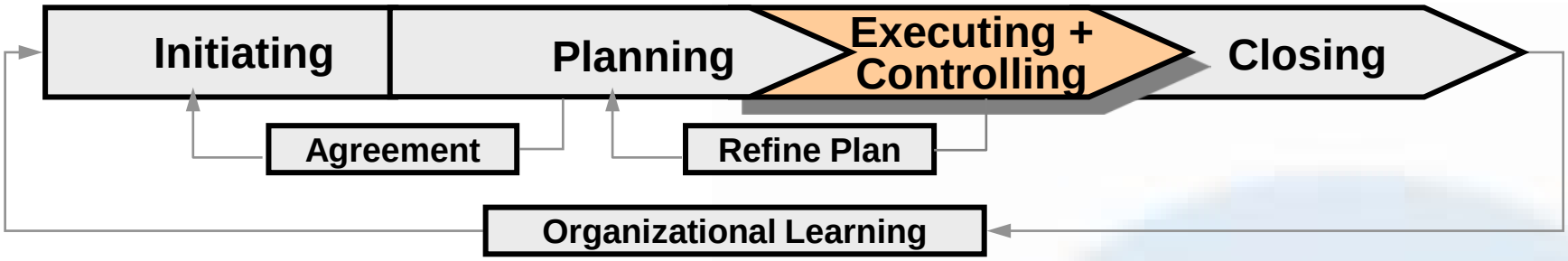


Use of planning and task scheduling instruments and techniques

(See Section 2.3)

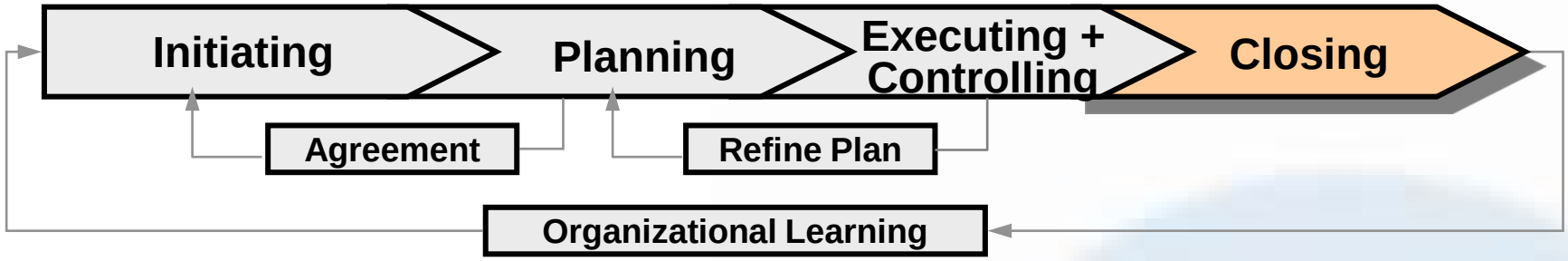
3. Project phases



Source: Strategic Management Group, Inc ®

- Monitor the progress of the project
- Identify potential changes in the project plan as fast as possible
- Report on the project progress to stakeholders
- Hold milestone meetings

3. Project phases



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- Complete the project documents
- Review the project
- Save and share experiences of projects

What tasks still need to be done on completion of the project?

Tie up loose ends

Share knowledge and what has been learnt in projects

3. Project phases

Project Phases/Activities	Initiate	Plan	Exec. & Control	Close
1. Developing the project goal				
2. Identifying stakeholders				
3. Communicating with team and stakeholders				
4. Negotiating for resources; assessing risk				
5. Consulting client/end-user				
6. Planning				
7. Recruiting/Training				
8. Implementing				
9. Managing Risks				
10. Checking & Correcting				
11. Documenting Lessons Learned				
12. Closing & Transitioning to Operations				

Source: Strategic Management Group, Inc. ®

3. Project phases

What is a successful project?

Classic definition

- In time
- Within budget
- Meets specifications
- Meets or goes beyond clients' expectations

Dynamic definition

The main stakeholders agree that the project is a success, long after it has been completed

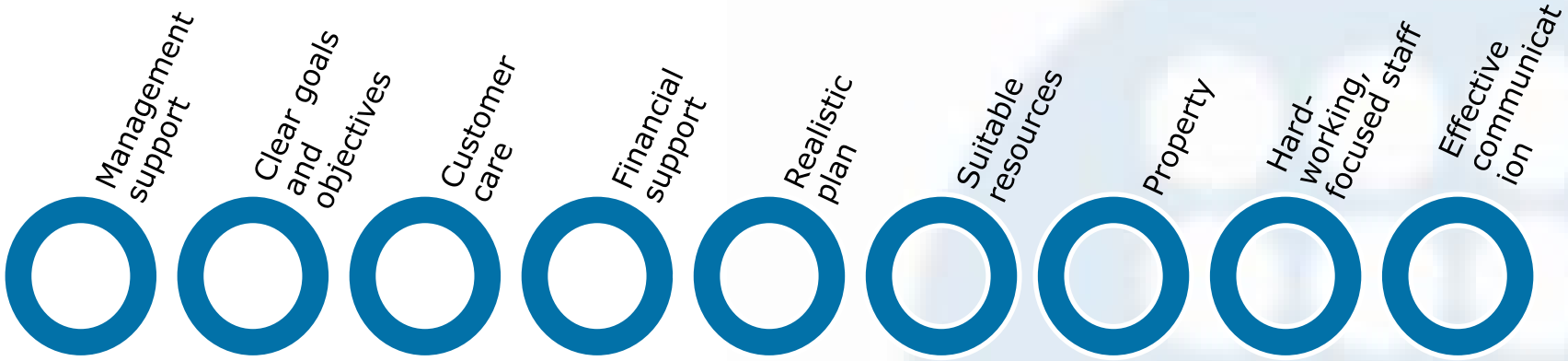
Business definition

- The project is in line with the business strategy
- The cash flow is enough to meet costs, obtain profit and cover the cost of capital
- Creation of value for stakeholders

3. Project phases

What is a successful project?

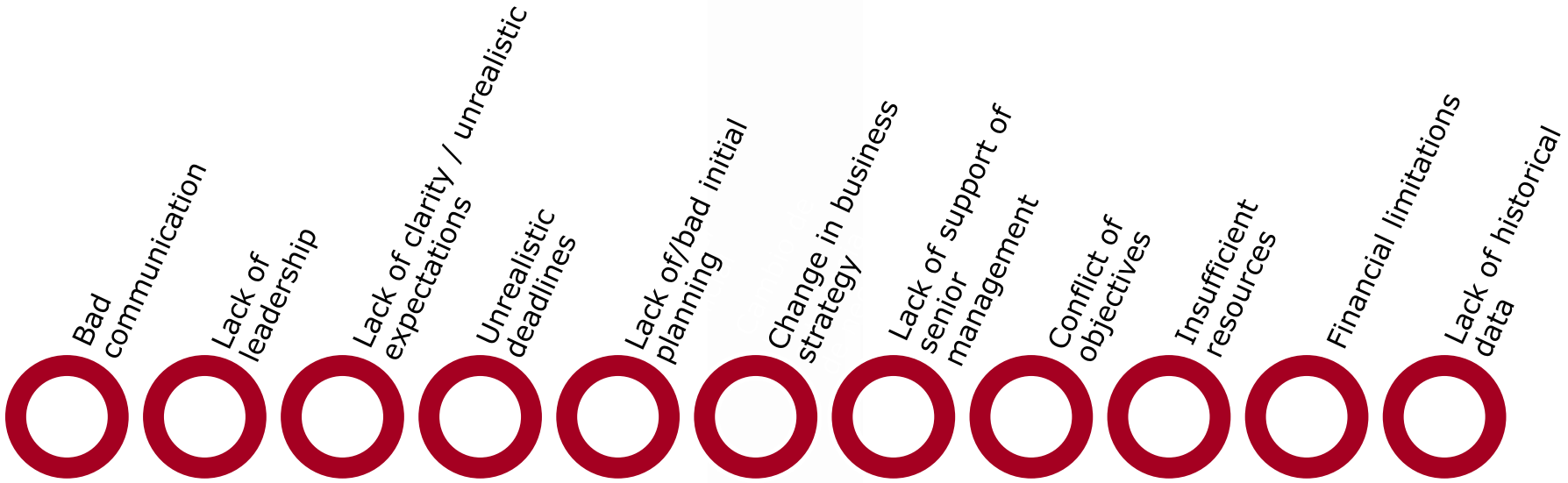
Facilitators of success



3. Project phases

What is a successful project?

Inhibitors of success



4. Basic vocabulary

Previous considerations

- It is important to **include all sections** of the project, in order and in the same format (*think about the reader!*)
- It is important **to explain the recommendation** resulting from the work that was undertaken (t*he best alternative to meet the specifications was considered to be…*)
- It is extremely important to use the concept of **viability** correctly:
  - Technical viability (*feasibility*): determination of whether a solution is possible or not, and of the maturity of the relevant technologies (experimental stage, pilot stage, pre-commercial stage, commercial stage, decline stage).
  - Economic viability (*profitability*): determination of the profit that can be obtained through the execution of the project, and the risk.
  - Financial viability: determination of real possibilities of obtaining the funding required to execute the project.
  - Environmental viability: long-term sustainability.

4. Basic vocabulary

Basic specifications

- Detailed explanation of the **conditions that must be met** by the project. These may be exclusive (essential requirements) or recommended (requirements that allow a choice between various alternatives).
- The **quantitative specifications** are made by the client (*e.g. the size of the plant*), the current regulations (*e.g. emission limits*) or other previous projects (*e.g. market studies, basic design, viability study*).
- Examples:
  - Number of machines to support
  - Open software
  - Specific software. Specified by the client.
  - Robustness

4. Basic vocabulary

Example

- Object of the project
  - Software design
  - Study to improve the production line
  - Study to improve the layout of the plant
- Justification/utility
  - … adaptation to new technologies
  - … changes in technological environment
  - … a necessary reduction in operating costs
- Scope
  - Replacement of current software
  - Redesign or adaptation
  - Viability study

5. Project documents

Project documents present the development effort in an understandable format, and are the main instrument for measuring the quality of a project and for communicating with all project stakeholders.

- **Report**: basic document to understand the problem, the various alternatives, the justification of the proposed solution, its (technical, economic and environmental) viability, and the planning of activities. Should include conclusions and recommendations for the project.
- **Appendixes**: additional documents that provide details of the calculations (when applicable) and additional information (catalogues, lists, references that are hard to access, etc.).
- **Plans**: graphic documents that make it easier to understand the solutions that were analysed and recommended.
- **Budget**: basic document describing the costs associated with implementing the proposed solution.
- **Specifications**: basic document describing the “conditions” that should be applied to the project implementation (legal, software, hardware, tests, contracts, etc.).

5. Project documents

Report

- All reports should include the following sections at the beginning:
  - Title
  - Object
  - Justification / Utility
  - Background (if applicable)
  - Scope
  - Basic specifications
- It should be clear from the report that the problem described by the client has been understood, and the aspects that need to be defined in the resolution of the problem, as well as the conditions, are known.
- Environmental plan (environmental impact)
- Economic and profitability study for the project
- Conclusions
- Glossary of terms

5. Project documents

Appendices

- As many as required, numbered and with a table of contents.
- The specific formulation of calculations should be put in the appendices. Only the most significant results should be included in the report.
- If calculation software is used, it should be detailed in the appendices, together with a list of the parameters that were entered and the lists of results. The report should state which software was used.
- Catalogues, handbooks, offers and all other documents from “suppliers” should be included in the appendix.
- General rules and regulations do not need to be added to the appendices (they will be mentioned in the section of the report that describes regulations). The same applies to references and handbooks in general.
- Only the most specific regulations or references will be included in the appendices.

5. Project documents

Plans or graphic documents

- As many as required to clarify the project.
- As the project becomes more clearly defined, the volume of graphic information increases considerably.
- Three groups of graphic documents can be distinguished:
  - Plans: always to scale / contours, scales and legends → interpret or propose a feasible reality
  - Outlines / sketches: concepts / not highly embellished → overall view of a complex situation
  - Diagrams: process / flow → symbolic representation of elements and subsystems in the overall project
- There are specific regulations for the plans and symbols used (including how they are folded!).
- Representations should be standardized.

5. Project documents

Budgets

- One budget for the solution that is developed.
- Any partial “budgets” that were drawn up for the selection process will only be described in the report and the appendixes.
- Detailed budgets will be broken down into:
  - Measurements (only physical units, no prices)
  - Unit prices (specific prices and lump sums)
  - Budget (combination of the above)
- Specialized databases of unit prices can be found.

5. Project documents

Specifications

- A section that defines and describes the following:
  - How equipment and materials for use in the project will be defined, received, stored, assembled and tested.
  - Procedures for measuring, assembling, testing and evaluating quality, and safety measures for the construction and operation of the facilities.
  - Procedures for interpreting discussion points.
  - Responsibilities, penalties, rights and duties of the project stakeholders.
  - Specific requirements for defining solutions (beyond basic specifications).
- Normally adapted to existing specifications (technical, economic, optional and legal specifications).

5. Project documents

Minutes

- Other intermediate documents in addition to the above are needed for project development. One of the main ones are “minutes”.
- Minutes can be used to monitor the progress of the project from the perspective of the communication between the project team and the client.
- Minutes have three main sections:
  - Identification (date, place, attendees and order of the day).
  - Topics covered (presentation of points for each part).
  - Agreements made (variations and clarifications of points of the project, with an indication of who will be responsible for developing them, the deadline and the cost).
- The minutes are included at the end of the report.

5. Project documents

Form of the documents

- **General guidelines** for writing project documents:
  - Write clearly.
  - Re-read what you have written, if possible other members of the group should check the document.
  - Use a spelling and grammar checker.
  - Number pages, tables, photos, equations and other resources used in the text. Generate the corresponding “footers”.
  - Generate tables of contents: general, for tables and for figures
  - Combine text with images, as far as possible.
  - Clearly define the different sections.
  - Adopt and use predefined formats (type of letter and formats for chapters and subchapters, etc.).
  - Clearly separate the documents (even if they are bound in the same volume).
  - “Covers” for similar documents.

5. Project documents

Form of the documents

- To organize the documents that are included in the project **report**:
  - Cover: title, authors (group, specialization), date and place, REPORT
  - Table of contents
  - Title / Object
  - Justification / Utility
  - Background (if applicable)
  - Scope
  - Basic specifications
  - Definition of alternatives
  - Selection of the best solution. IMPLEMENTATION
  - Environmental plan
  - Economic and profitability study
  - Summary and conclusions
  - Recommendations
  - Glossary of terms
  - (Acknowledgements, if required)
  - (Regulations and references, if required)

5. Project documents

Form of the documents

- For the content and writing of **appendix** documents
  - Use a grammar and spell checker.
  - Use similar formats for covers as the content may vary.
- For the content and drawing up of **plans**
  - Remember to set the margins, scale the document and fold to A4 size. Should be contained in a file of “loose documents”, with an index.
- For the content and drawing up of the **budget**
  - Measurements, unit prices and budget.
- For the content and drawing up of **specifications**
  - Check there are no incompatibilities or inappropriate texts.

Material

The material in this module was written by:

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- Manel Rajadell, professor of the Department of Management, UPC
- Marc Eguiguren, professor of the Department of Management, UPC

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