PROJECT CYCLE MANAGEMENT FOR DIGITAL, ECOLOGICAL AND SOCIAL INNOVATIONS

Euro-planning techniques

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Recap of the last lesson

- From problem tree to the tree of objectives
- The logical framework matrix
- General objectives
- Specific objective
- Results
- Deliverables/outputs/outcomes/milestones
- Activities
- Indicators
- Sources

Hypotheses

Assumptions are external conditions that may influence the progress of the project but **do not depend directly on it**.

These are objectives that, in the Tree, lead to the project's goal but cannot be achieved because **they belong to areas of intervention that the project cannot directly influence**.

Hypotheses

Example: **training programmes for the unemployed are aimed at increasing employment**.

However, in order to achieve this objective (= increasing employment), such programs rely on the assumption that other conditions will be met (e.g. reduced labor costs for businesses, growing demand for certain goods or services, etc.), but in a way that is completely independent of the training program.

The question to ask is: "**What are the conditions/factors that may have an impact on the implementation of the project and its long-term sustainability, but which are not under the control of those managing the project?**".

Hypotheses

The hypotheses must be evaluated using a **risk analysis algorithm**, which allows the true nature of each of these external conditions to be defined: some will be removed from the Logical Framework because they are not important, some will actually be considered as hypotheses, others defined as “killer hypotheses” (elements that hinder the success of the project), with two possible consequences in this case: either the design process is not continued because the project will not achieve its objectives, or the condition is reintroduced as internal, as a result or activity of the project.

The **risk analysis algorithm** is a tool that allows us to identify the risks associated with the project and to assess their impact on the project's objectives.

Hypotheses - risk assessment algorithm

	La condizione esterna è importante?	
SÌ		NO
Sara realizzata da altri soggetti (esterni al progetto)		Non includere nel Quadro Logico
Sicuramente	Non includere nel Quadro Logico	
Probabilmente	Includere come ipotesi nel Quadro Logico	
NO	La condizione esterna può essere realizzata all'interno del progetto?	
SÌ		NO
		Attenzione Ipotesi KILLER!

Risks

The purpose of project risk management is to identify, analyze and continuously monitor **all factors of uncertainty related to the project** in order to minimize the probability of occurrence and impact of those risks that could arise uniquely in each project and, therefore, to maximize the project's chances of success.

Risks

Risk management is a cyclical, methodical and codified procedure aimed at:

- identifying
- analyzing
- planning responses
- monitoring

Risks

Potential but realistic risks outside the team's direct control, yet still needing to be managed in order to achieve results

- Defined at an operational level
- Relevant
- External but influenceable
- Expressed by describing a state of affairs
- Expressed in terms of probability/risk
- Require a proactive approach

Risks

Risk identification techniques, to be carried out through brainstorming sessions with the project team, are:

- **cause-effect analysis**: what can go wrong and what consequences this would have;
- **effect-cause analysis**: the reverse process to the previous one, aimed at identifying particularly harmful effects that need to be avoided and, therefore, identifying their possible causes;

Risks

- **detailed analysis of the Work Breakdown Structure (WBS)**: “critical” analysis of each element of the WBS to be carried out in parallel with one of the two techniques described above. This helps to ensure that no detail is overlooked.
- **consultation with experts**: given the critical importance of risk management for the success of the project, consultation with risk management experts, although likely to be costly, is recommended for project teams with little experience.

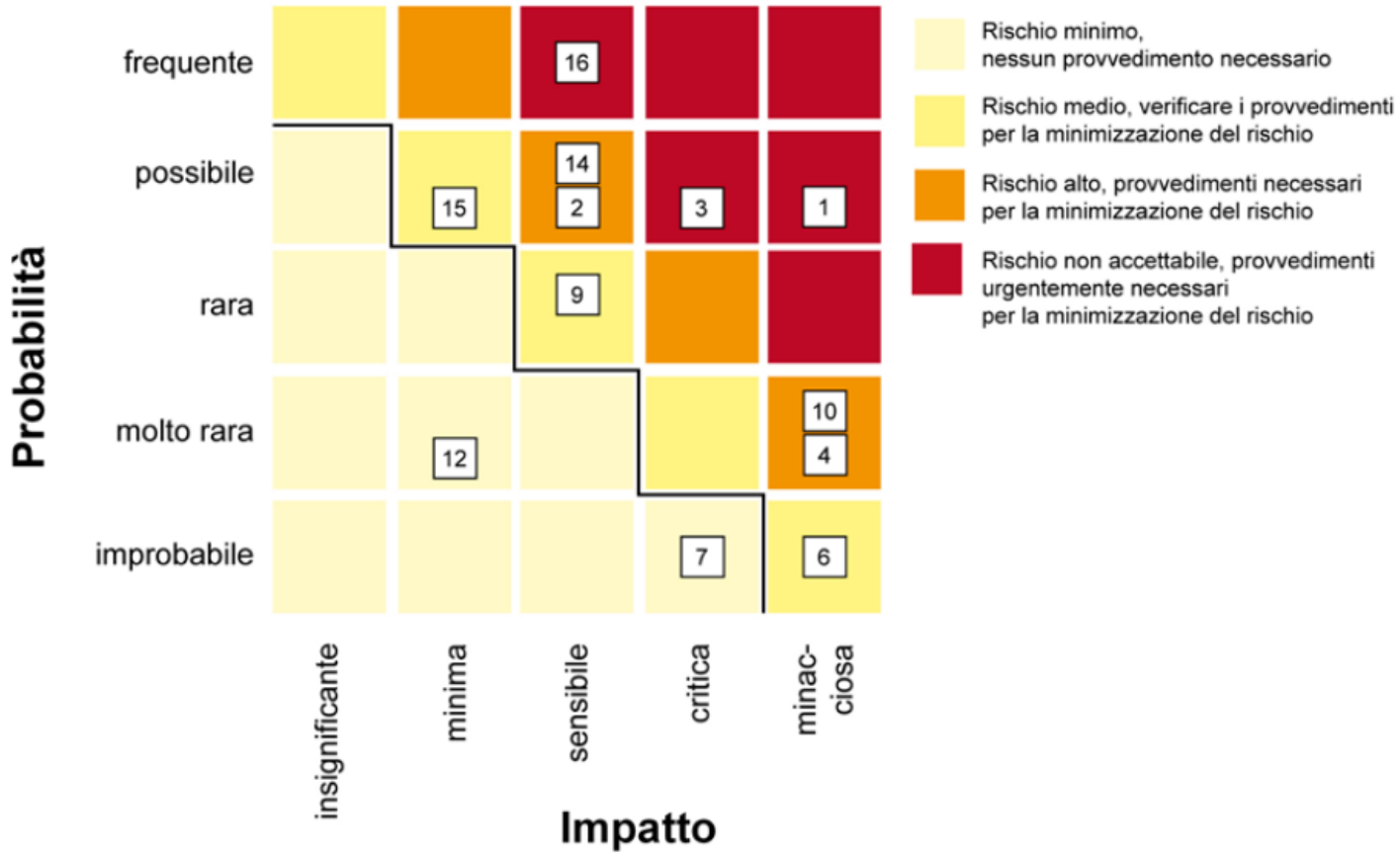
Risks

Once the risks have been identified, they must be analyzed, i.e.:

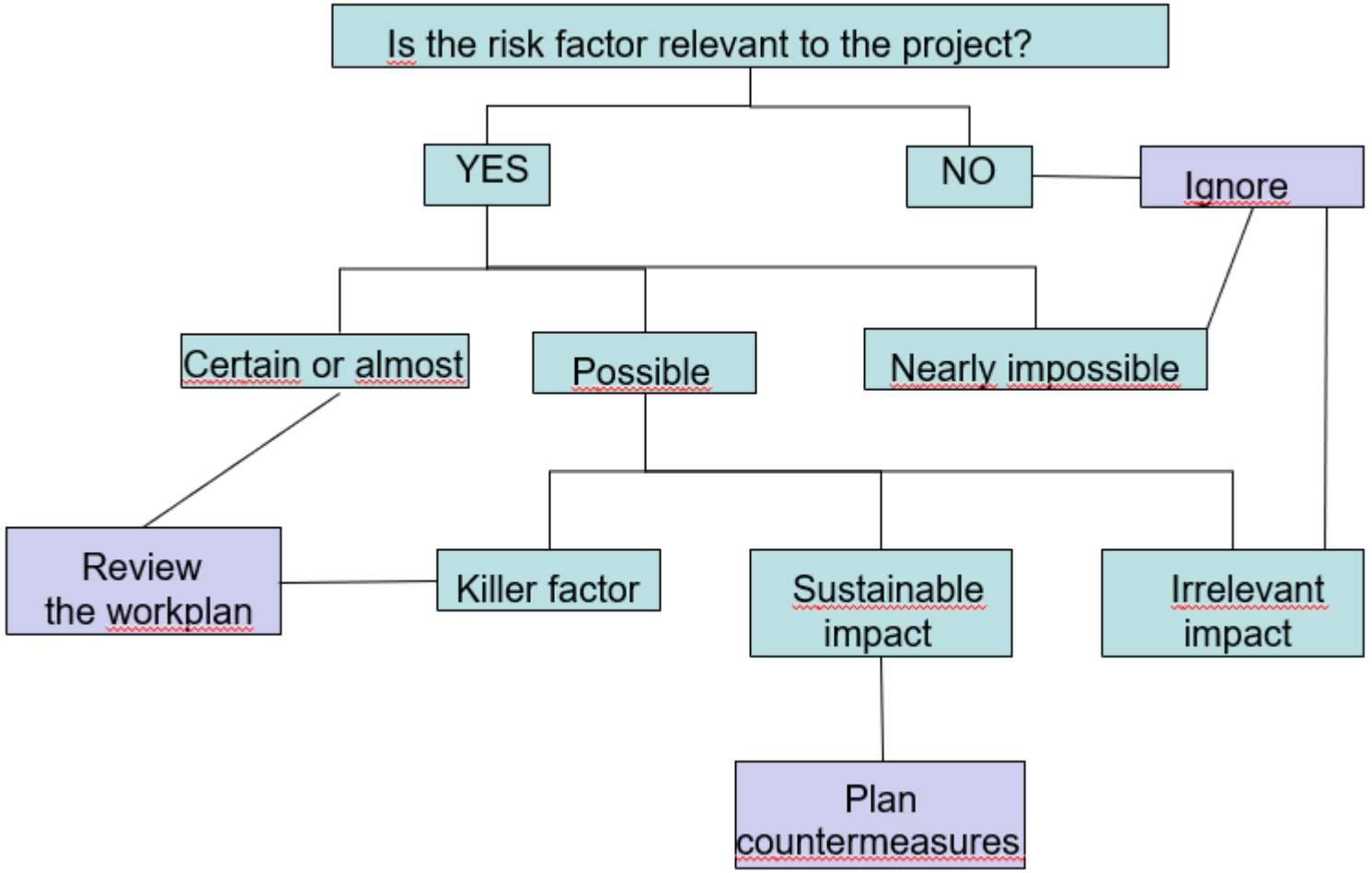
- **assign the probability of occurrence**;
- **assess the impact if they materialize**.

Estimating the probability and impact allows risks to be assigned a higher or lower level of criticality and then classified, providing the project manager with the information needed to decide where to intervene and with what priority. The most commonly used representation of risk levels is that proposed by the **risk management matrix**.

Risks


Probabilità
frequente
possibile
rara
molto rara
improbabile
16
14
2
15
3
1
9
10
4
12
7
6
insignificante
minima
sensibile
critica
minac-
ciosa
Impatto
Rischio minimo,
nessun provvedimento necessario
Rischio medio, verificare i provvedimenti
per la minimizzazione del rischio
Rischio alto, provvedimenti necessari
per la minimizzazione del rischio
Rischio non accettabile, provvedimenti
urgentemente necessari
per la minimizzazione del rischio

Risk evaluation



Risk response strategies

The possible risk management strategies are:

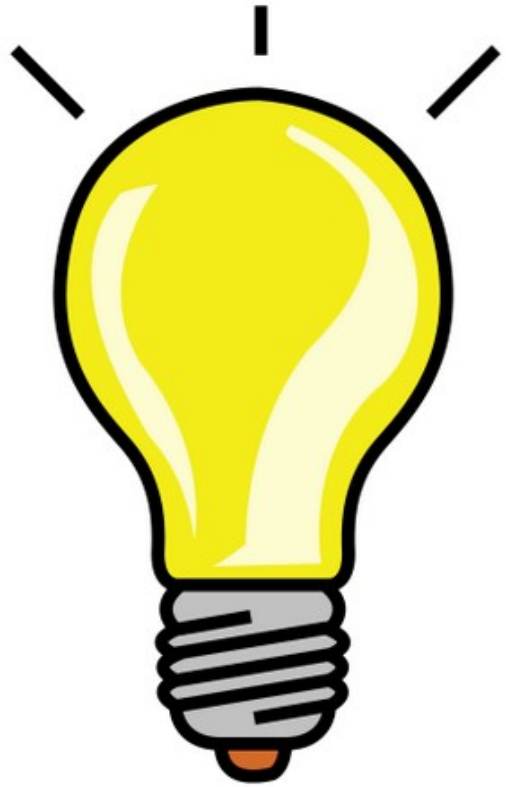
- Accept the risk;
- Avoid the risk;
- Mitigate the risk;
- Transfer the risk;
- Share the risk.

Beware of risks!

Be careful not to confuse risks with structural or logical deficiencies in the project!

Exercise - spot the mistakes: identify countermeasures for the appropriate risks

- Delay in the development of WP3;
- Exceptionally rainy season;
- Market price increase well above the trend of previous years;
- Poor training of the research team;
- Stakeholders do not approve the proposed solution;
- Collapse in demand for X products
- Building permit granted by December 2030.



Sustainability factors

Experience shows that long-term sustainability depends on the following factors:

- **Policy support from the government** with which we collaborate to ensure the continuation of the services provided by the project after the end of funding;
- **Appropriate technologies**: continued use of new techniques and technologies introduced during the project, availability of spare parts;
- **Institutional and entrepreneurial capacity**: ability and willingness of project participants to continue providing services beyond the funding obtained;

Sustainability factors

- **Economic and financial feasibility**: do the benefits outweigh the costs? Is the project a profitable long-term investment?
- **Socio-cultural and gender issues**: consideration of beneficiaries' needs and motivation and participation in the distribution of long-term benefits.
- **Ecological impact**: the extent to which the project protects or damages the environment and consequently supports or hinders the achievement of long-term benefits.

Before continuing: from the Objectives tree to the Logical Framework Matrix – case study (Formez)

Fig. 1 - Albero degli Obiettivi

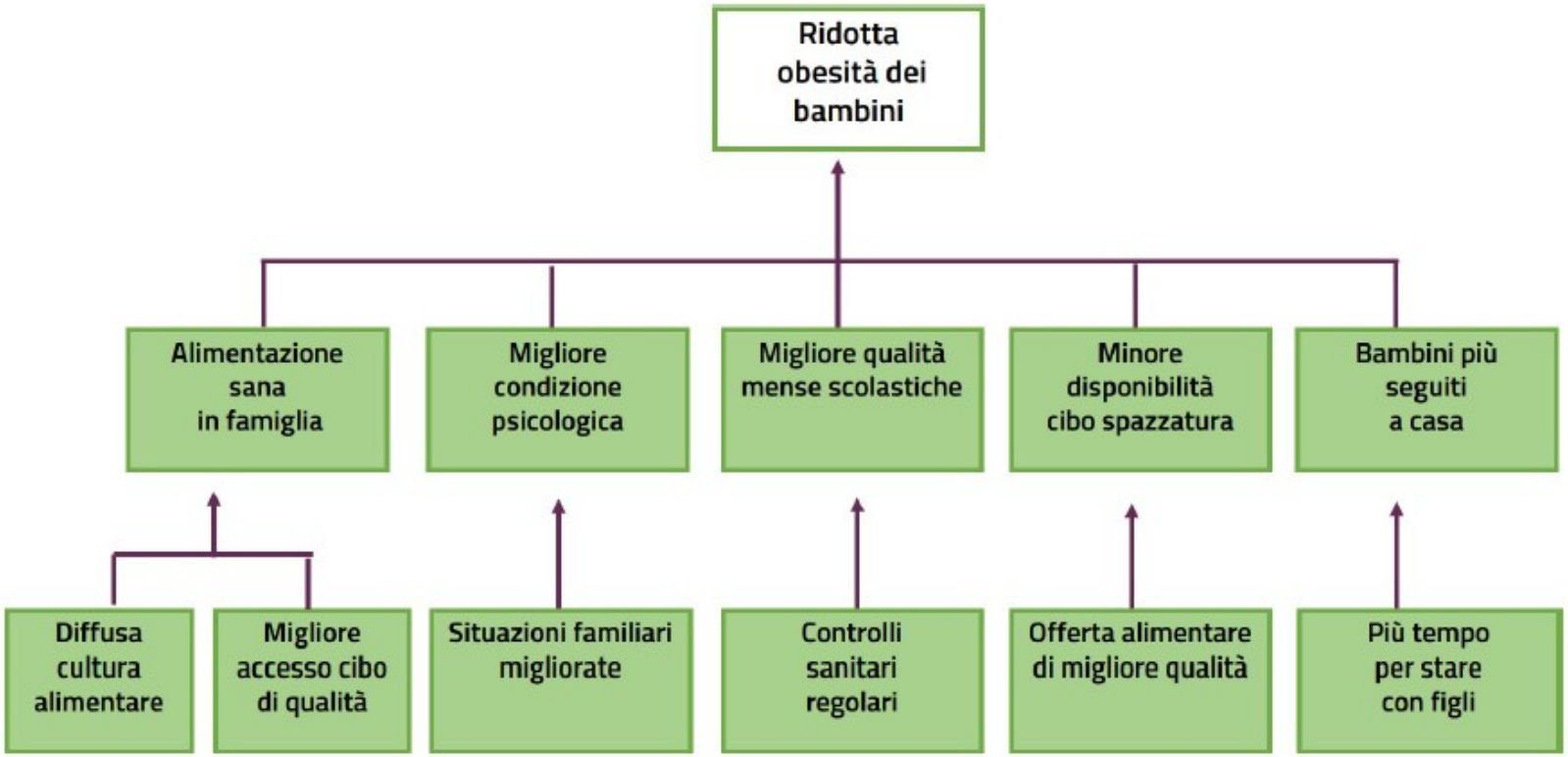


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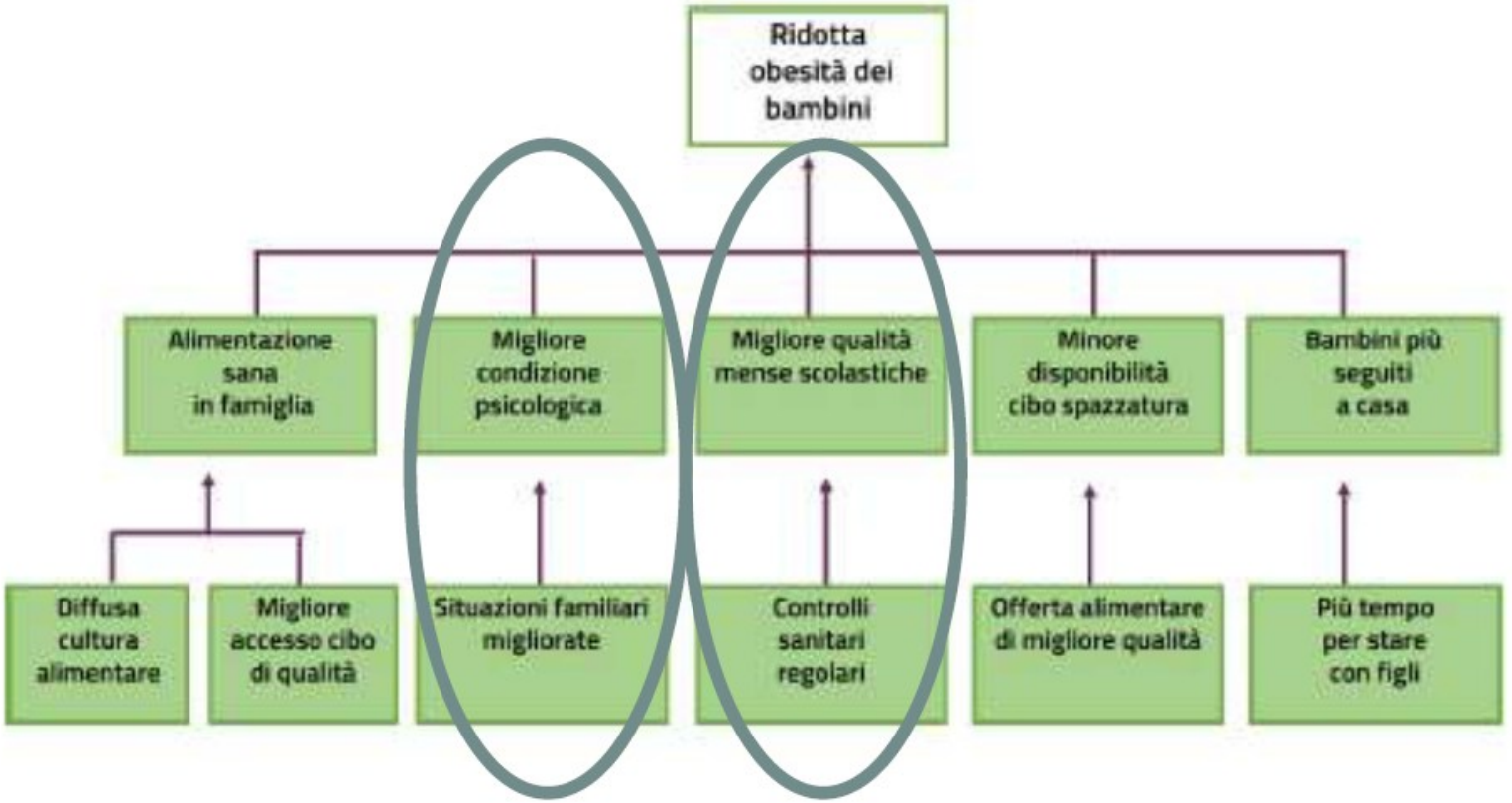
Fig. 1 - Albero degli Obiettivi



The Logical Framework Matrix of our case study (Formez)

	Logica di intervento	Indicatori oggettivamente verificabili	Fonti di verifica	Ipotesi
Obiettivi generali	Miglioramento stato di benessere della popolazione; Riduzione spese sanitarie nel territorio	Riduzione del 30% delle patologie X, Y e Z; Riduzione del 20% dei costi della sanità pubblica	ASL, Ministero Salute	
Scopo del progetto	Riduzione dell'obesità nei bambini	Diminuzione del 40% dei bambini da 0 a 6 anni affetti da obesità nel territorio X	ASL, indagine ad hoc	Riduzione altre patologie; Razionalizzazione costi sanitari

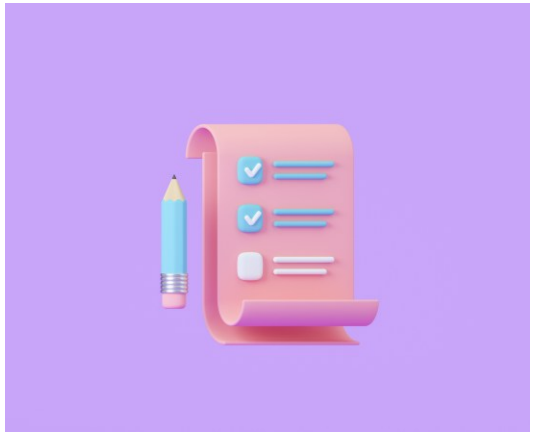
The Logical Framework Matrix of our case study (Formez)

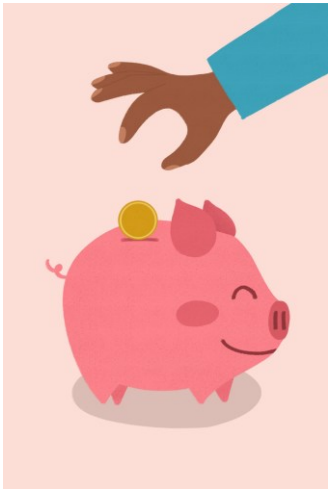
Risultati	R.1. Condizione psicologica dei bambini migliorata	R.2. Migliorata qualità mense scolastiche"	R.1 Più della metà dei bambini sottoposti a test psicodiagnostici dimostrano miglioramenti	R.2 Il 90% delle mense offre cibo di qualità	R.1 Indagine ad hoc R.2 Dipartimento servizi scolastici Comune e ASL	Alimentazione più sana in famiglia
Attività	A.1 Servizio di sostegno psicologico per i bambini e le famiglie	A.2 Effettuazione controlli regolari	A.1 N. 50 famiglie seguite con sedute di sostegno di almeno un'ora alla settimana per 6 mesi"	A.2 Minimo due controlli al mese in ognuna delle 50 mense scolastiche del territorio	A.1 Documenti di progetto A.2 Dipartimento servizi scolastici Comune e ASL	(R.1) Riduzione degli episodi di bullismo e prevaricazione (R.2) Ottimizzazione dei sistemi di aggiudicazione degli appalti
						PRECONDIZIONE: Adesione dei genitori al progetto

From the Logical Framework Matrix to the executive design

To get from the MQL to the actual project, three more fundamental steps are necessary:

- Task List/Work Breakdown Structure(WBS)
- Time Schedule (GANTT)
- Resource and Cost Plan (BUDGET)





From the Logical Framework Matrix to the executive design

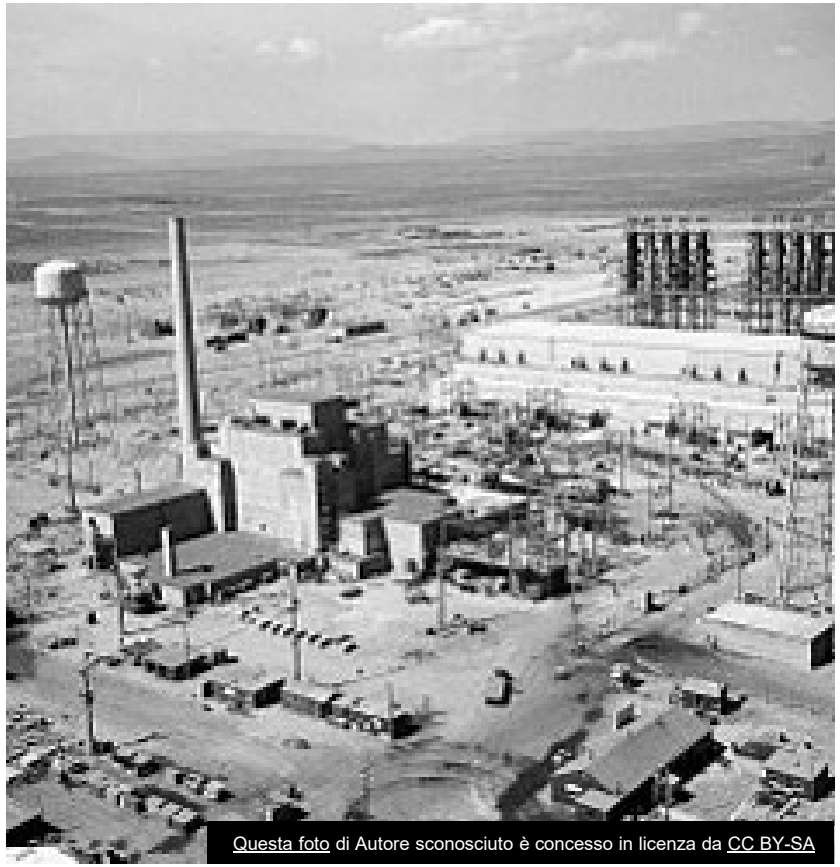
During the First World War, Henry Laurence Gantt (1861-1919), a mechanical engineer, studied ways to optimize the sequence of tasks required to build the naval fleet.

His charts, the famous **Gantt charts**, are still widely used by modern project managers today. Based on his work, other fundamental tools were developed, such as resource allocation and **Work Breakdown Structure (WBS)**, used to represent the structure of a project's activities.

From the Logical Framework Matrix to the executive design

During the Second World War and in the period that followed, the first truly structured projects based on a modern concept of project management saw the light of day. Among these, the **Manhattan Project** stands out, launched by the US government with the aim of developing atomic weapons, which represents the symbolic date of the birth of project management.

From the 1990s onwards, this methodology was adopted by the European Commission for projects financed with its own funds.



From the Logical Framework Matrix to the executive design

Operating logic:

– **Break down the project's work** (activities and deliverables) into **smaller work packages** (WPs), which are then divided into further activities;

– **Logical sequence of activities** (content or timeline).

The Work Breakdown structure (WBS)

Starting from the main activities listed in the MQL, and the main products (deliverables and outputs), the WBS is obtained by **breaking down activities and products into smaller, more manageable components**.

The breakdown consists of **dividing the project into elements of decreasing complexity so as to manage its structure.**

It is the document in which the project team outlines all the actions necessary to complete the project.

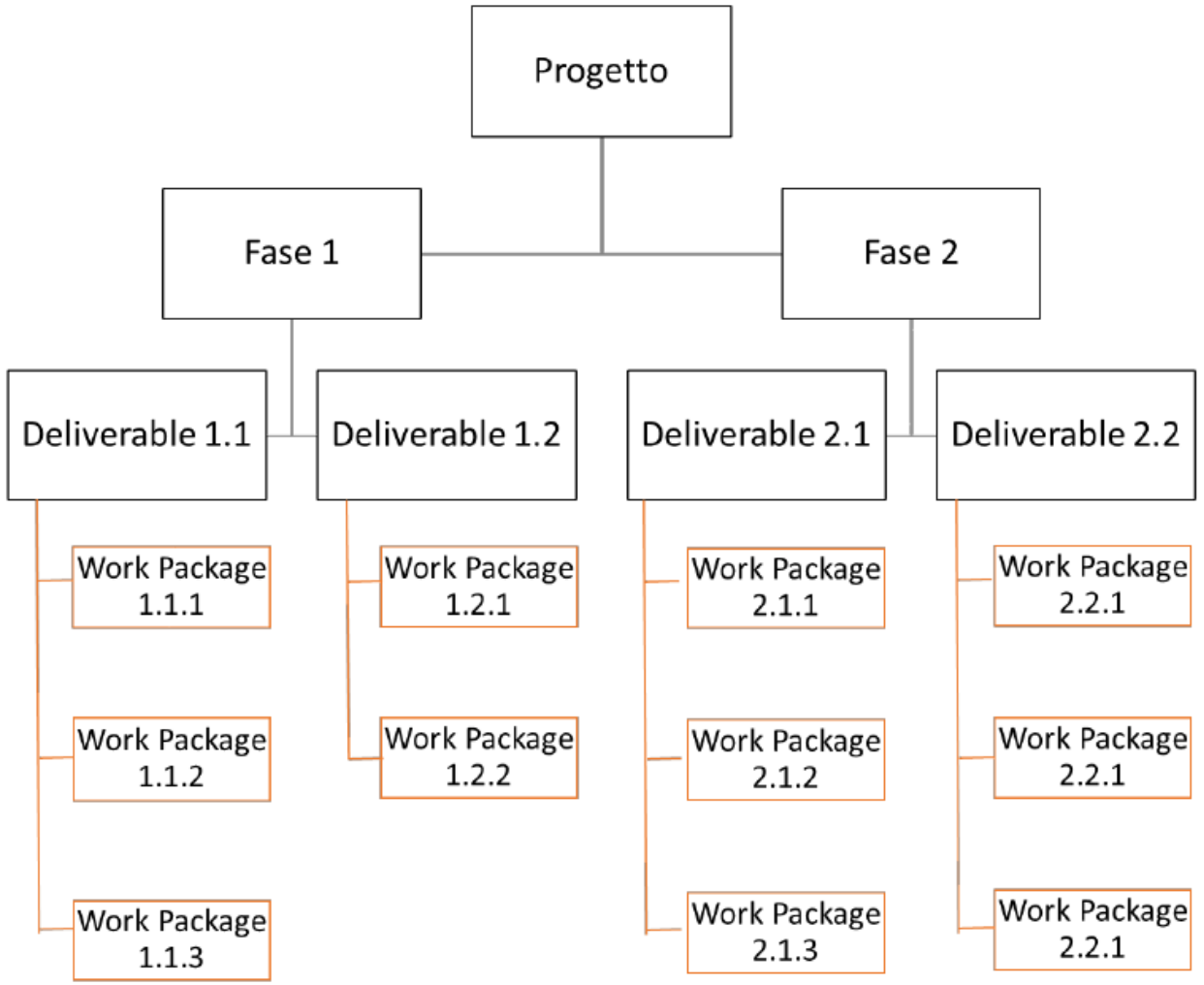
The Work Breakdown structure (WBS)

Activities are broken down into subtasks until the operational tasks are detailed, allowing for an estimate of the time and resources required.

These elementary parts, which therefore represent the final level of decomposition, are called **WPs (Work Packages).**

The WPs make up the project and contain the detailed information that defines the project itself, such as the start and end dates and the content in terms of macro-activities and their respective results.

Generic WBS example (reverse diagram representation)



Generic WBS example (reverse diagram representation)

The combination of actions necessary to achieve the deliverables will constitute the WBS. In other words, the WBS is a **breakdown of the work during the project phases**, which follows the logic of the results that can be obtained through the performance of specific predefined activities.

The WBS will generally be developed first in the form of a block diagram and then in the more practical list form. Translated with DeepL.com (free version)

Complete WBS (common representation in numbered list)

	Task Mode	Task Name	Duration
0		**Technology Conference**	**47 days**
1		**Identify areas of focus for conference**	**5.5 days**
2		Evaluate topics with organizing committee	3 days
3		Select short list of topics	2 days
4		Vote on final topics	0.5 days
5		Areas of focus for conference selected	0 days
6		**Select venue for conference**	**9 days**
7		Create a list of possible venues	3 days
8		Check pricing and availability of venues	5 days
9		Evaluate venues and make a selection	1 day
10		Conference venue selected	0 days
11		**Publicize the Event**	**23 days**
12		Design and publish conference website	5 days
13		Buy advertisements in industry publications	3 days
14		Issue press release to media partners	3 days
15		Announce event via social media channels	5 days
16		Publicity complete	0 days

Complete WBS (common representation in numbered list)

Level	WBS Code	Element Name	Element Name
1	1	Foundations	All of the work necessary to build a foundation
2	1.1	Excavate	Create a hole ready for the foundation to be framed and poured
3	1.1.1	Dig	Dig a hole of the right shape and size in the correct location
3	1.1.2	Level	Level the hole so that is packed, even, and ready to receive the foundation
2	1.2	Frame	Frame the foundation including steel supports
2	1.3	Concrete	Acquire, transport, pour, and cure the concrete foundation
3	1.3.1	Pour	Pour, pack and level the foundation
3	1.3.2	Cure	All procedures necessary for the foundation to cure successfully
1	2	Exterior	All of the work necessary to complete the exterior of the house
1	3	Interior	All of the work necessary to complete the interior of the house

Example of division of activities between WPs

WP1: Management

WP2: Communication and dissemination

WP3: Data collection

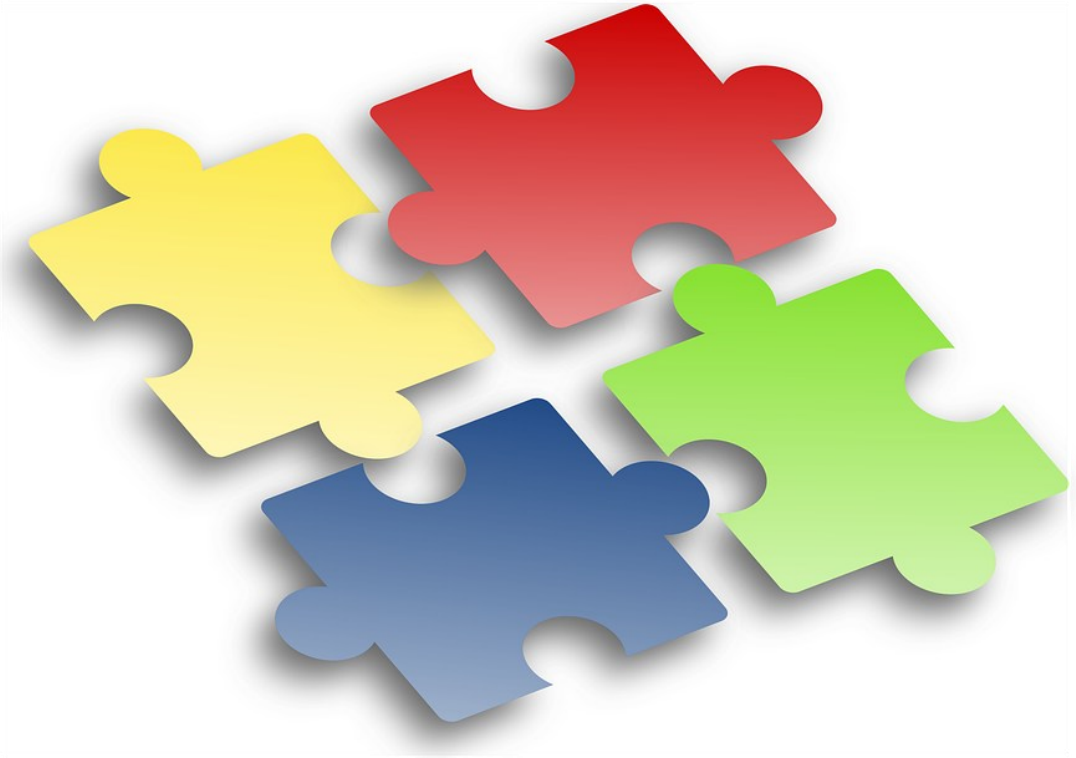
WP4: Data analysis

WP5: Experimental phase of the new product

WP6: Prototype development

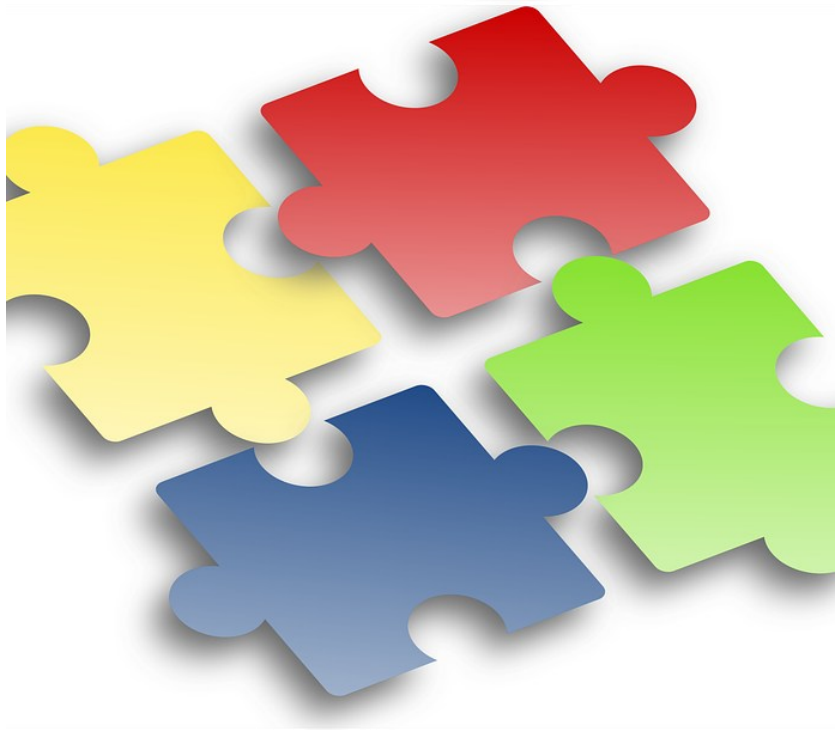
WP7: Market study and business plan

WP8: Monitoring



WPs in projects

- Do not plan too many; on average, there should be between 4 and 8.
- It is mandatory to include WP management and WP communication and dissemination.
- It is advisable to include WP monitoring.
- All project partners always participate in WPs (best practice).
- Each partner is responsible for one or more WPs (= WP leader).
- WPs are in turn divided into project tasks (further sub-activities).



From WBS to activity scheduling – the GANTT chart

The time planning of activities (= **timeline**) allows us to plan activities over the course of the project and monitor their progress.

- The timeline is represented by a **GANTT chart**, a bar chart that shows the work plan.
- Each WBS activity will be represented by a bar.
- The ends of the bar represent the planned start and end dates.

From WBS to activity scheduling – the GANTT chart

- The length of the bar represents the planned duration, divided into incremental phases (e.g., days, weeks, months).
- The work plan will be approved (**baseline of the schedule**) before the start of activities and, as such, all its content will be validated by the facts.
- It allows us to plan activities over the duration of the project and monitor their progress;

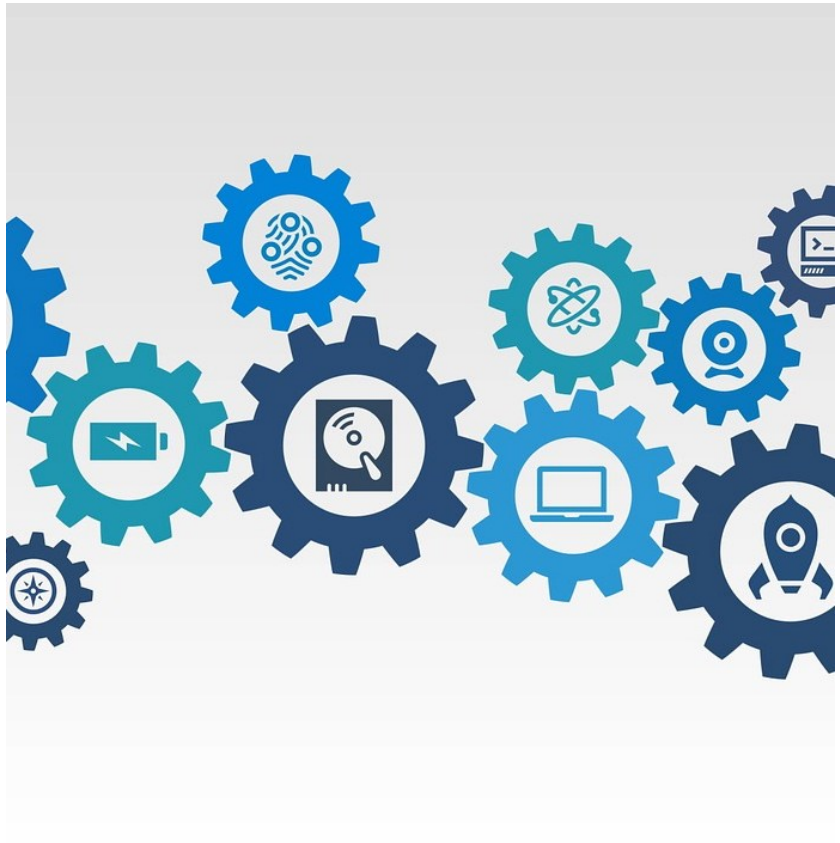
From WBS to activity scheduling – the GANTT chart

- **Mandatory** for some calls for proposals (e.g. in the Horizon Europe Framework Programme for Research and Technological Development);
- It provides us with an overview of the timetable for each activity;
- It is useful for monitoring activities that take place sequentially or in parallel.

From WBS to activity scheduling – the GANTT chart

For the scheduling of activities, on which I will build the GANTT chart:

- I must identify and document the **logical relationships between the planned activities**;
- above all, I must define the **interdependencies between activities**, identifying predecessors (what precedes) and successors (what follows) and the possible time intervals (positive or negative) that separate the activity in question from its successors or predecessors. For example, “activity 1.2 cannot start before 1.1 has been completed” or “activity 1.2 can start no earlier than 5 days after the completion of 1.1”.



From WBS to activity scheduling – the GANTT chart

So, I will start by **estimating the duration** of each activity. At this stage, the following will be done:

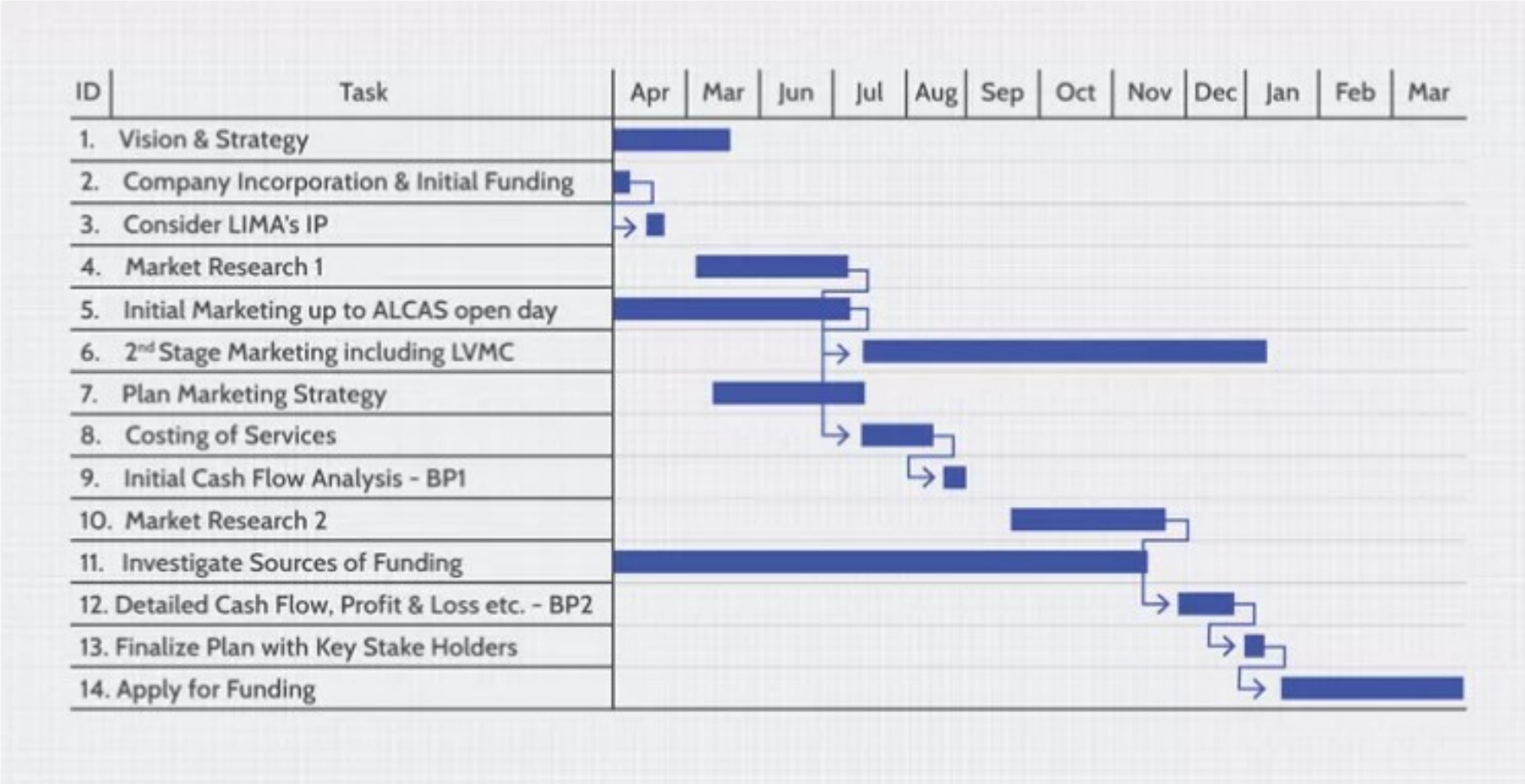
1. schedule the activities;
2. identify the start and end dates of each individual activity;
3. identify the total duration and start and end dates of each individual activity;
4. calculate the margin of flexibility (float or slack) for each activity;
5. draw up the GANTT chart.

From WBS to activity scheduling – the GANTT chart

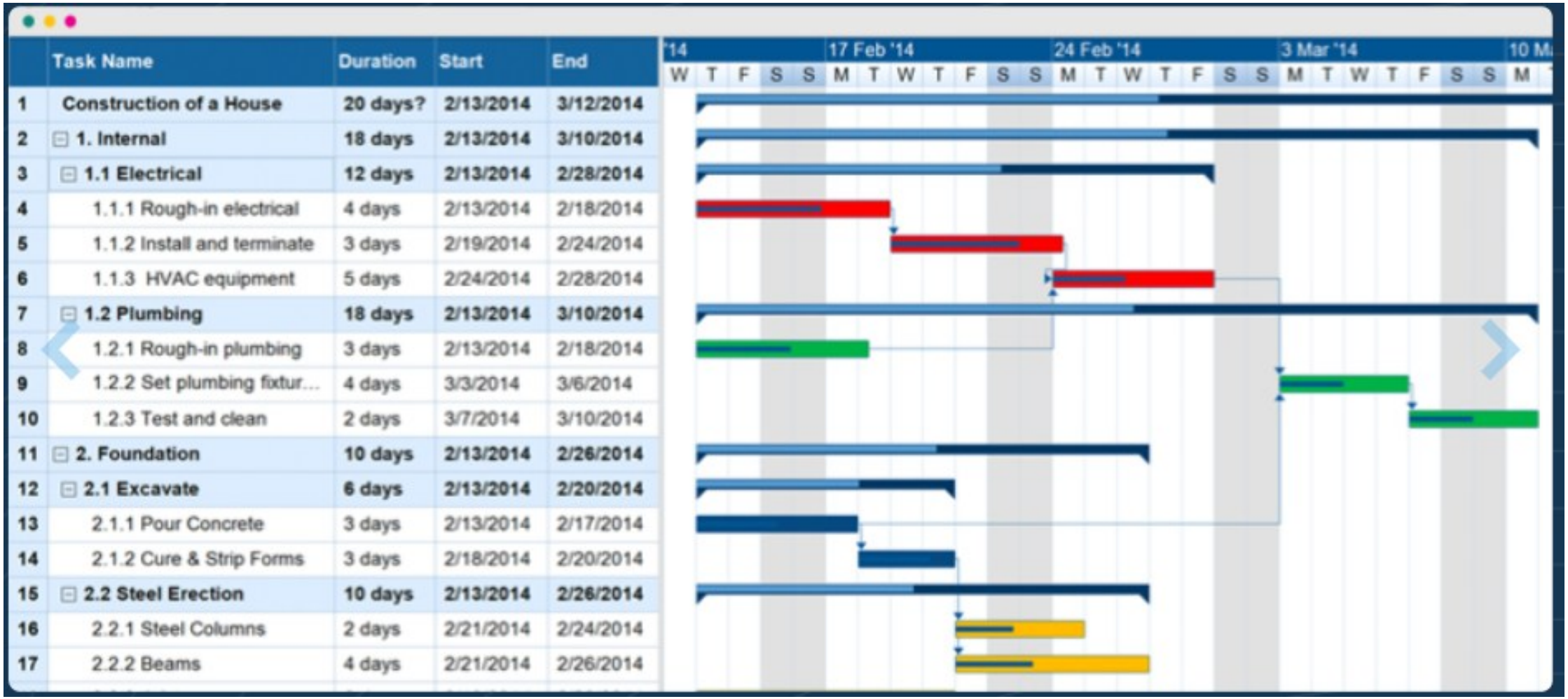
It is advisable that the entire project team be actively involved in this activity and, if there are serious doubts about the timing of the work, it may be necessary to seek external specialist advice.

An approximate schedule will certainly lead to a totally unreliable work plan.

GANTT chart


ID
Task
Apr
Mar
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
1. Vision & Strategy
2. Company Incorporation & Initial Funding
3. Consider LIMA's IP
4. Market Research 1
5. Initial Marketing up to ALCAS open day
6. 2nd Stage Marketing including LVMC
7. Plan Marketing Strategy
8. Costing of Services
9. Initial Cash Flow Analysis - BP1
10. Market Research 2
11. Investigate Sources of Funding
12. Detailed Cash Flow, Profit & Loss etc. - BP2
13. Finalize Plan with Key Stake Holders
14. Apply for Funding

GANTT chart



	Task Name	Duration	Start	End
1	Construction of a House	20 days?	2/13/2014	3/12/2014
2	1. Internal	18 days	2/13/2014	3/10/2014
3	1.1 Electrical	12 days	2/13/2014	2/28/2014
4	1.1.1 Rough-in electrical	4 days	2/13/2014	2/18/2014
5	1.1.2 Install and terminate	3 days	2/19/2014	2/24/2014
6	1.1.3 HVAC equipment	5 days	2/24/2014	2/28/2014
7	1.2 Plumbing	18 days	2/13/2014	3/10/2014
8	1.2.1 Rough-in plumbing	3 days	2/13/2014	2/18/2014
9	1.2.2 Set plumbing fixtur...	4 days	3/3/2014	3/6/2014
10	1.2.3 Test and clean	2 days	3/7/2014	3/10/2014
11	2. Foundation	10 days	2/13/2014	2/26/2014
12	2.1 Excavate	6 days	2/13/2014	2/20/2014
13	2.1.1 Pour Concrete	3 days	2/13/2014	2/17/2014
14	2.1.2 Cure & Strip Forms	3 days	2/18/2014	2/20/2014
15	2.2 Steel Erection	10 days	2/13/2014	2/26/2014
16	2.2.1 Steel Columns	2 days	2/21/2014	2/24/2014
17	2.2.2 Beams	4 days	2/21/2014	2/26/2014

Thank you for your attention!

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Project Cycle Management

Course in 'European Project Design Techniques'

Dr. Fabio Tomasi

Consortium for the Scientific and Technological Research Area of Trieste