Project Management and Soft Skills
Project Management: a Pragmatic Approach

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A.Y. 2017-18
Credits: 3

Project Management:
A Pragmatic Approach

This lecture block does _not_ aim at being general and comprehensive regarding the topic of Project Management,
as this would require an effort not compatible with the objectives of this course.
The elementary management tools used in project activities are introduced.

Project Management

Projects

A Project is a set of activities geared towards a specific ***goal***. A project has (limited) *financial*, *human* and *technical* resources, and is *time* constrained. A project is a temporary endeavour.

Project Management is the activity aimed at *planning*, *executing*, *controlling*, and *closing* the work of a team to achieve the project goal and meet specific (measurable) success criteria.

Project Management

Projects

Examples:

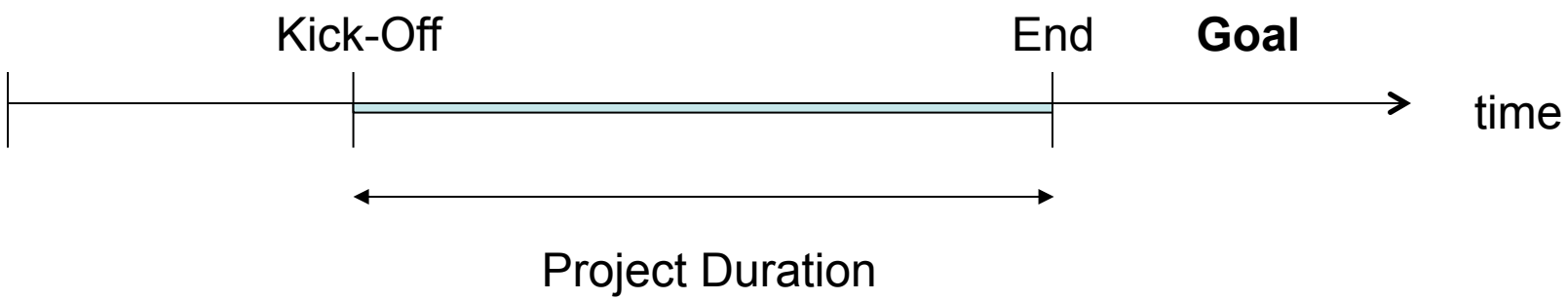
- Building a complex civil infrastructure (a skyscraper, a bridge, etc.)
- Innovate the machinery of an industry plant.
- Design, prototype, and test a new product.
- Develop a new service to be offered by an IT company.
- Organise a complex event (a conference, a school, etc.).
- ...

Project Management

Projects

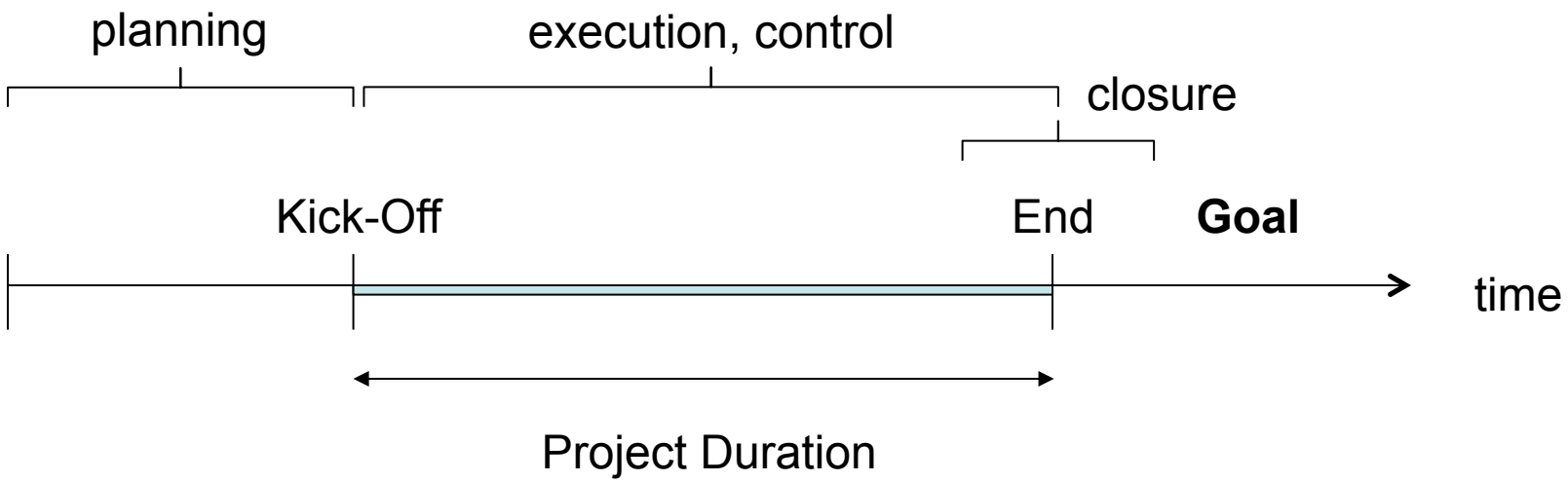
Project Management

Projects



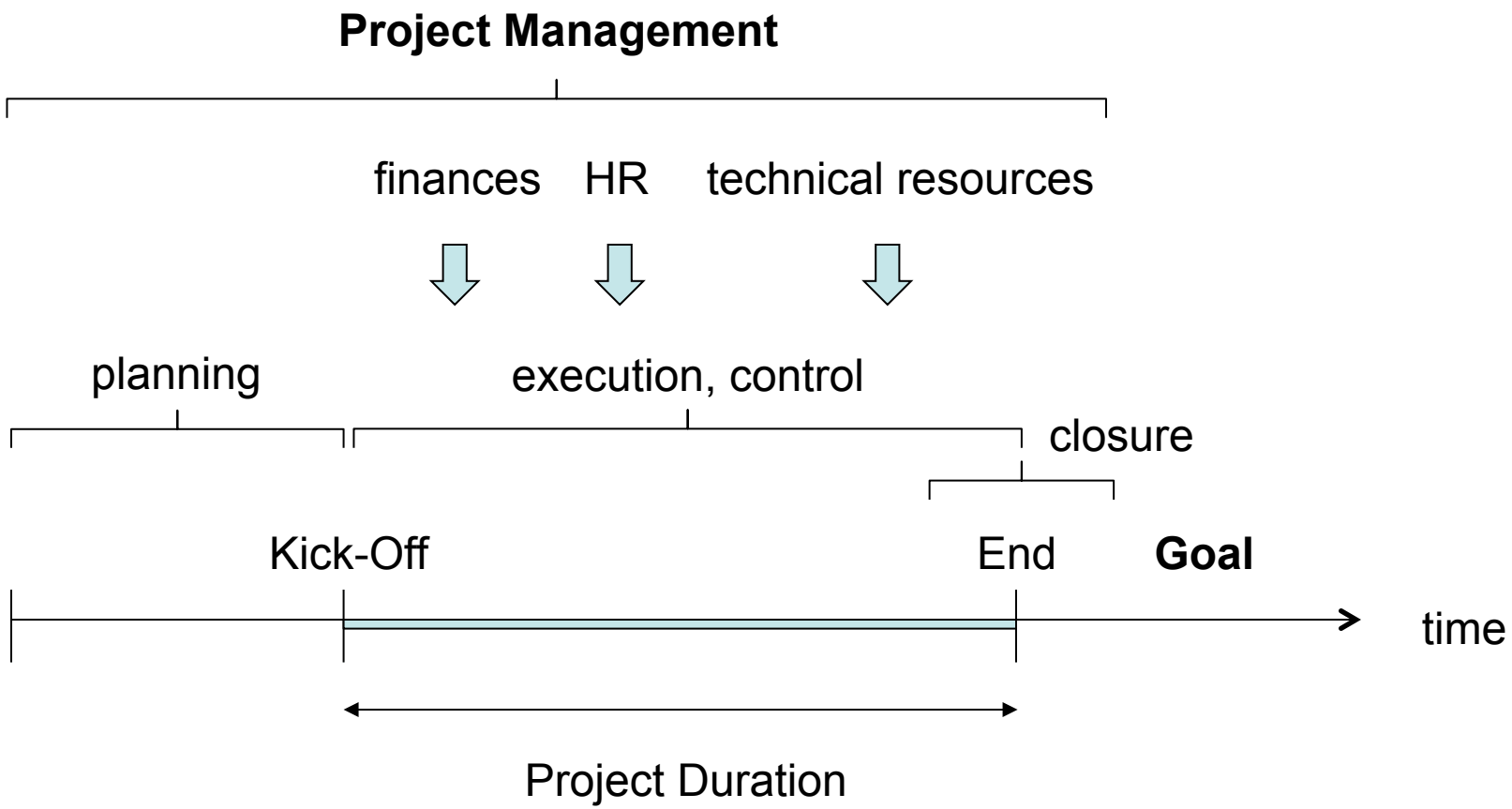
Project Management

Projects



Project Management

Projects



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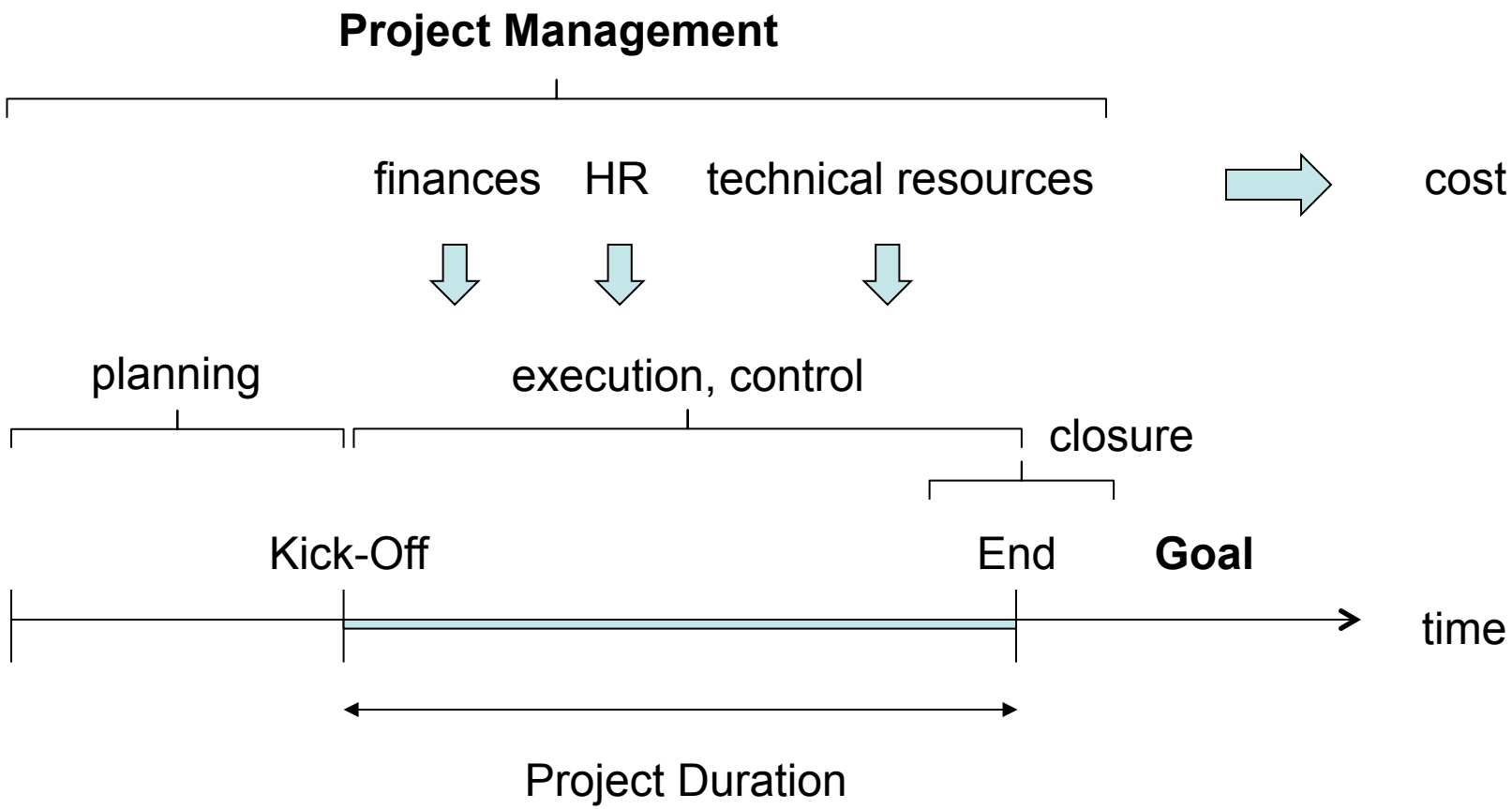
Projects



Project Management

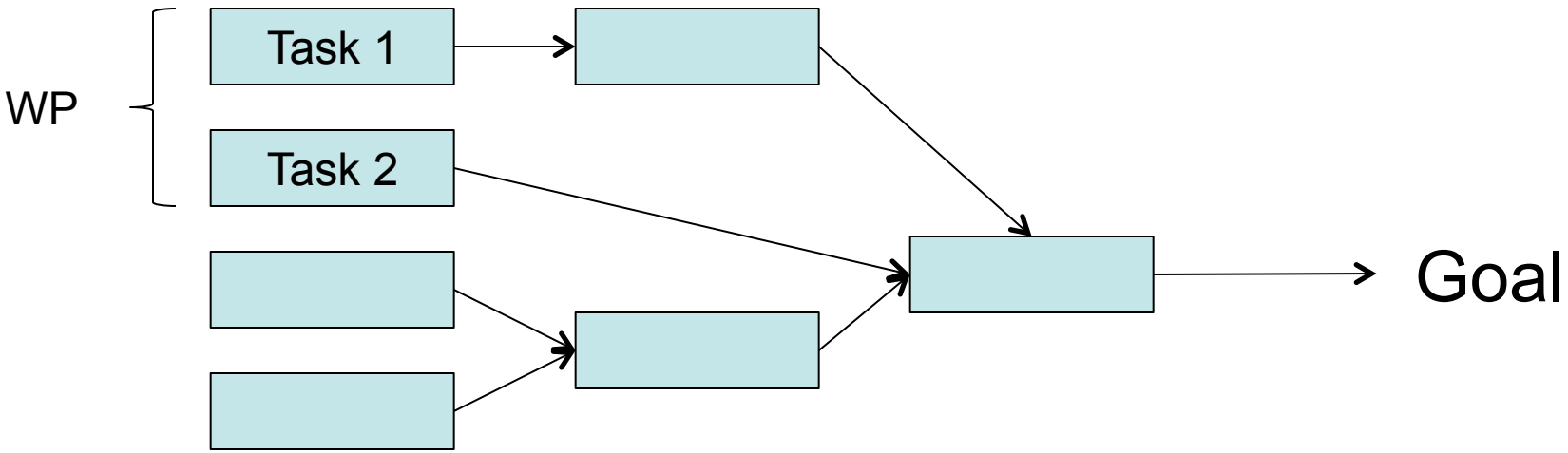
Projects

Any Activity in (Professional) Life

Project Management

Work Packages (WPs), Tasks

A project is formulated as a coordinated set of activities grouped into WPs and Tasks, (possibly in a tree-based fashion, forming a **WBS: Work Package Breakdown Structure**). The split into smaller, more manageable activities, makes management easier.



Project Management

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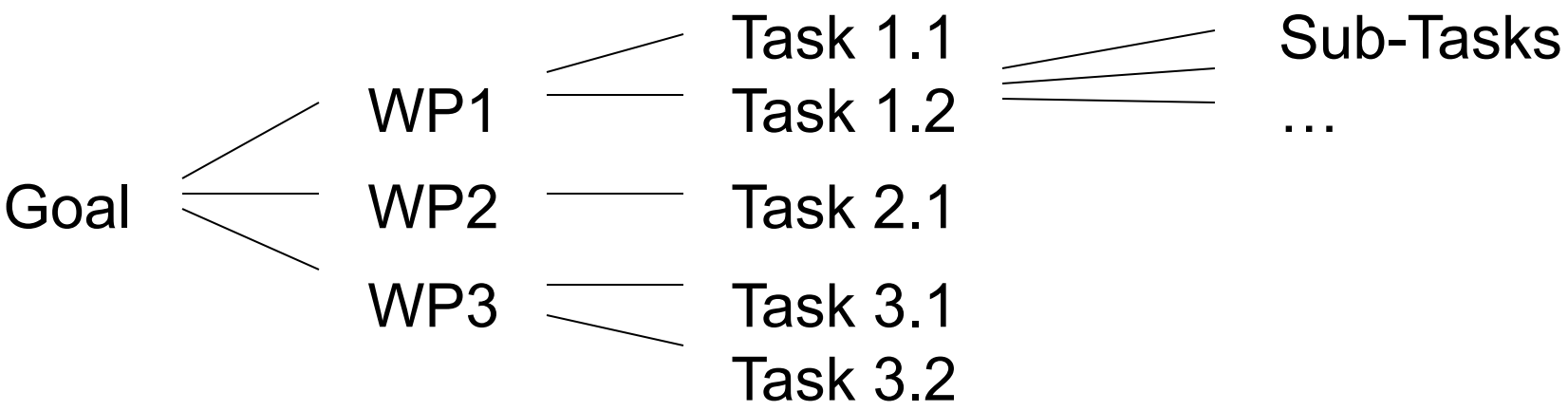

Project Management

Work Packages (WPs), Tasks

A project is formulated as a coordinated set of activities grouped into WPs and Tasks, (possibly in a tree-based fashion, forming a **WBS: Work Package Breakdown Structure**). The split into smaller, more manageable activities, makes management easier.

Every Task will be assigned a sub-goal and some resources (time, technical, financial, human) and a **leader** who will be responsible for the achievement of the goal.

The same applies to WPs, as they are composed of (multiple) tasks.

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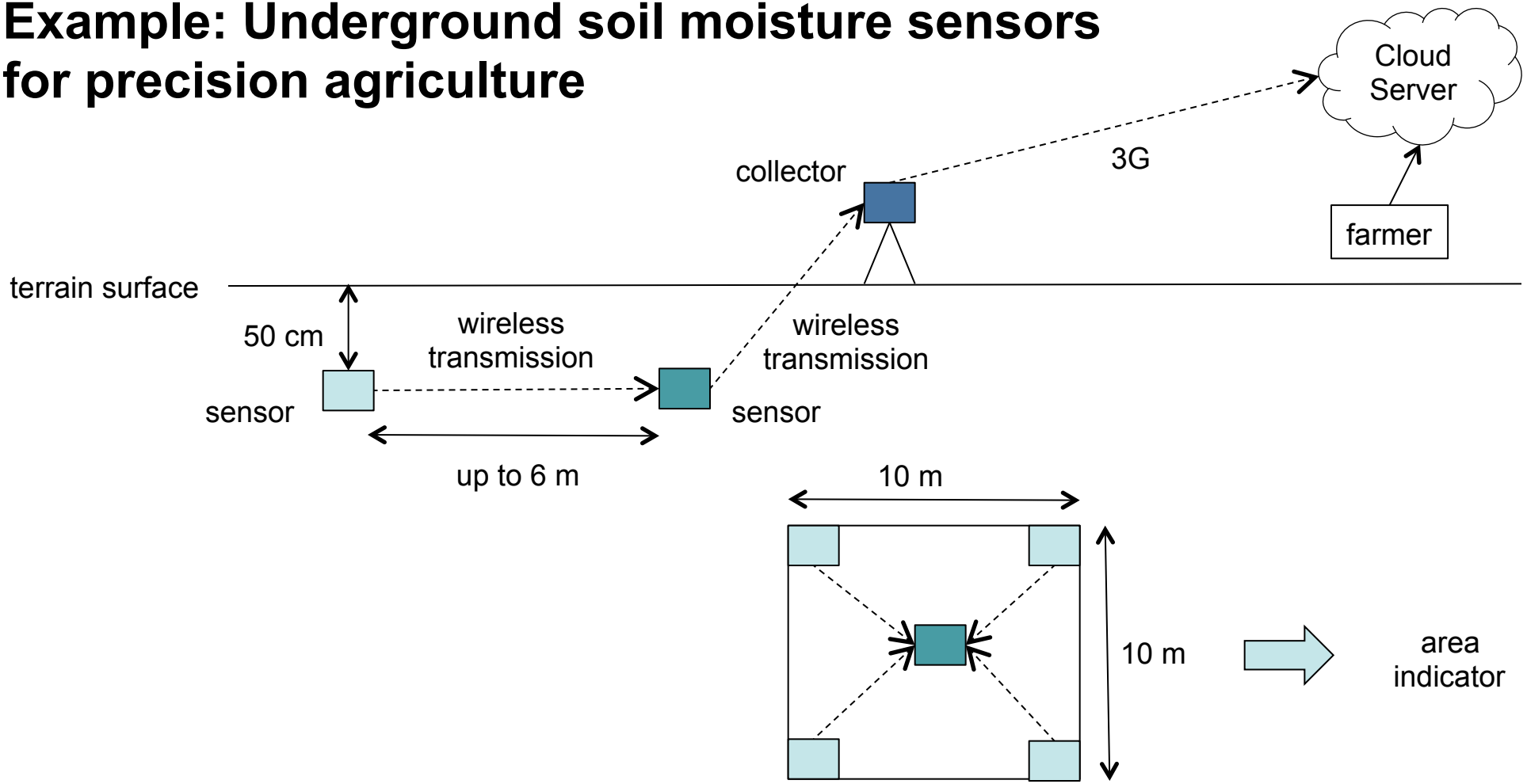
Example: Underground soil moisture sensors for precision agriculture



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Example: Underground soil moisture sensors for precision agriculture

Tasks:

- **T1: HW Design (sensor boards)**
- **T2: FW Development (sensor boards)**
- **T3: SW Development (cloud)**
- **T4: Prototyping and Lab Tests**
- **T5: On Field Tests**
- **T6: Data Analysis**

Project Management

Example: Underground soil moisture sensors for precision agriculture

Tasks:

- **T1: HW Design (sensor boards)**
- **T2: FW Development (sensor boards)**
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- **T4: Prototyping and Lab Tests**
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- **T6: Data Analysis**

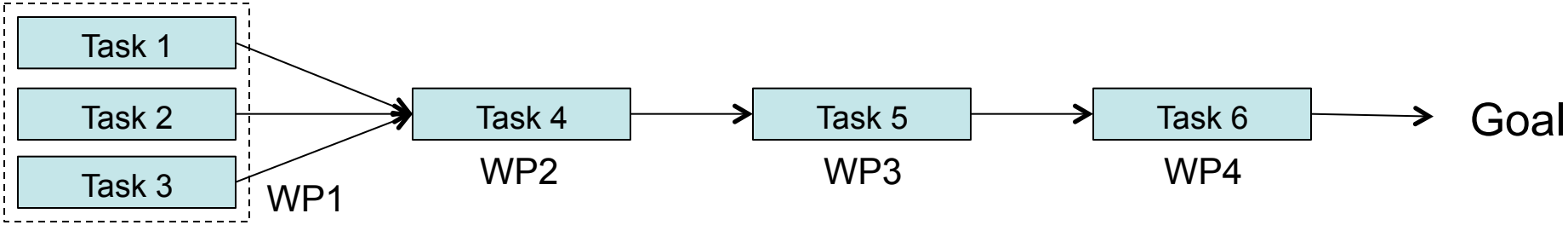
WPs:

WP1: Platform

WP2: Lab

WP3: On Field

WP4: Analysis



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Example: Underground soil moisture sensors for precision agriculture

Resources:

- **Financial:** 13,1 KEUR
- **Human:** one student, not skilled, 150 hrs
  one PhD student, skilled on Lab testing, 40 hrs
  one researcher, expert of (agricultural) data analysis, 40 hrs
- **Technical:** collector, cloud server
- **Time:** four months (April-July 2018)

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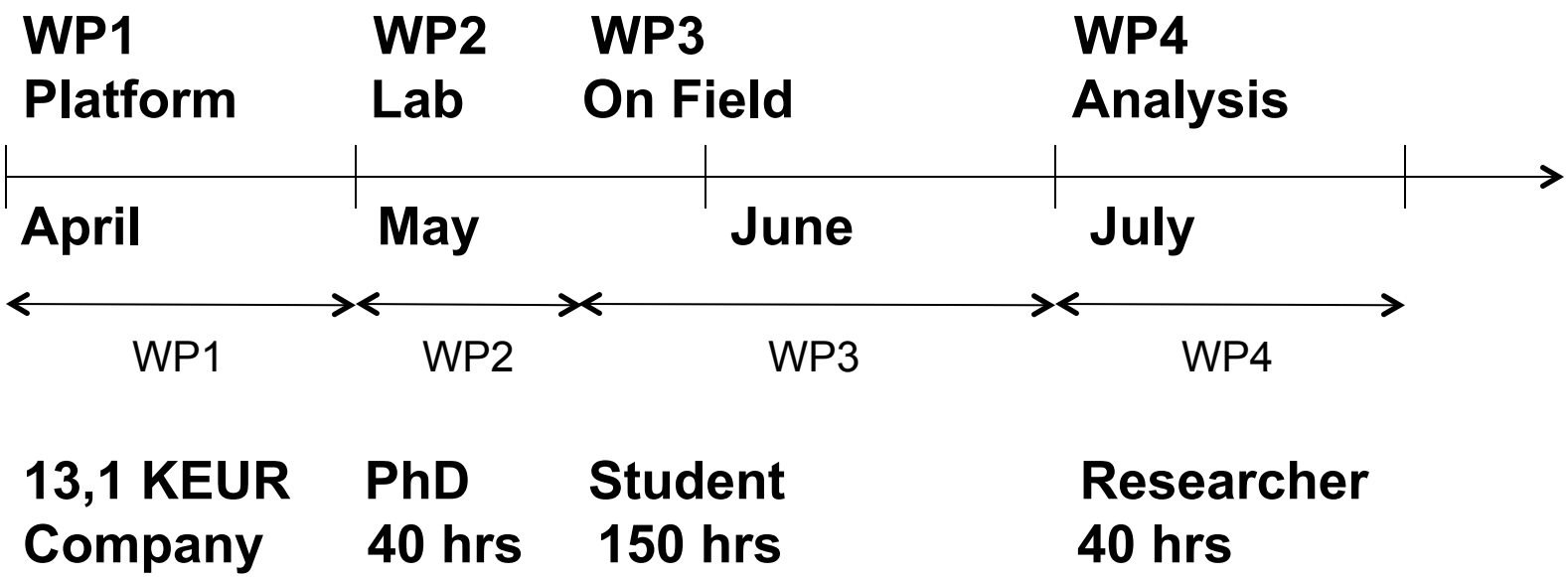
Example: Underground soil moisture sensors for precision agriculture

Resources:



Project Management

Example: Organising a group week-end in Venice.

WP1 - Travel

WP2 - Hotel

WP3 - Finances

WP4 - Cultural

Project Management

Example: Organising a group week-end in Venice.

WP1 - Travel	T1.1 - Choice from timetable T1.2 - Ticket T1.3 - Baggage
WP2 - Hotel	T2.1 - Choice T2.2 - Booking & Payment
WP3 - Finances	T3.1 - Assessment T3.2 - Gathering of funds
WP4 - Cultural	T4.1 - Choice of events

Project Management

Interactive Session #1 − Teams of 3 | 15 min

Organising a Summer School.

Your company X develops mechanical components, and you want to train students towards the set of competences that your company might need in the future. To this purpose, you will organise a summer school, to be offered to graduate students with an engineering degree. The school will include lectures given by University professors, and lab sessions offered by other companies belonging to the group led by company X.

Define a WBS including all activities to be planned and executed **before** start of the school, for its preparation (goal is KO of school).

Project Management

Interactive Session #1

Any team presenting their outcome ?

*** Attendance Check ***

Fill attendance form

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Teaching
PMSS
end of webpage
“Attendance March 22”

Short Break

Project Management

Deliverables, Milestones

Every activity of a project produces as an outcome an intermediate or final output to be used by other project activities, or delivered to the outside world.

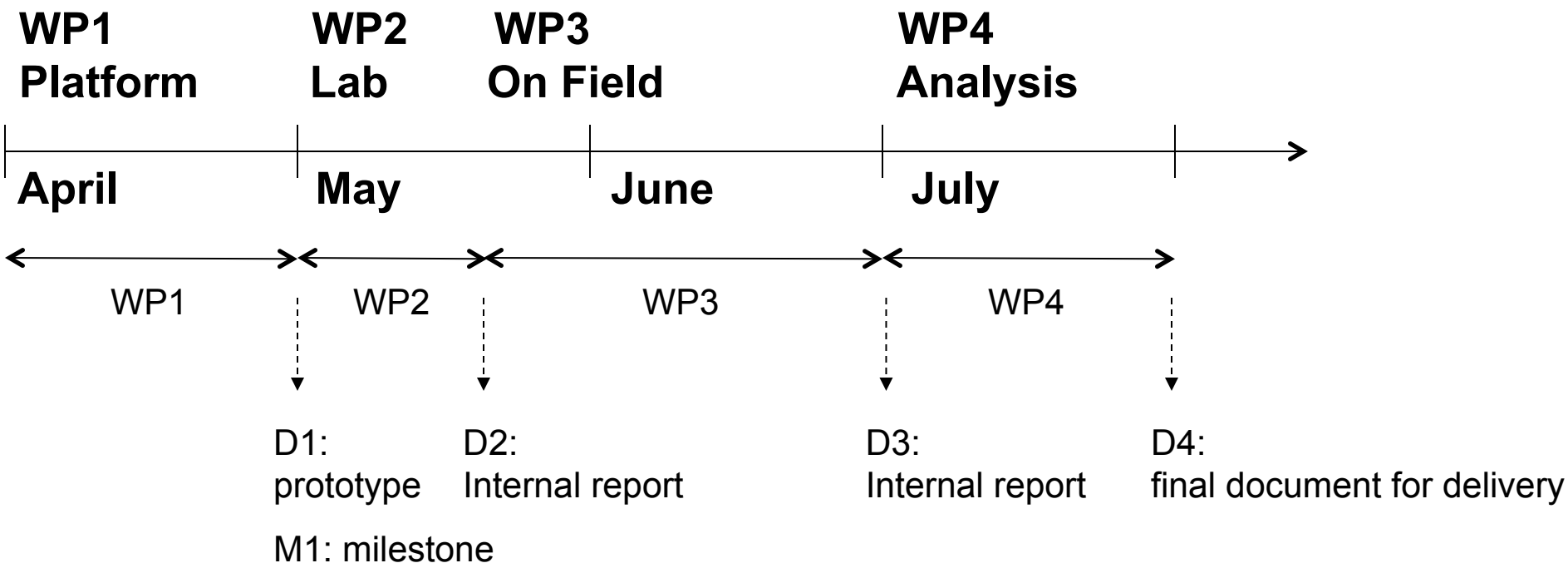
These outputs (**Deliverables**) can take the form of technical reports, documents, hardware prototypes, software, video, websites, etc.

Some key points on the time axis describe moments when relevant deliverables are provided, or when something happens thet generates the start of activities. They are denoted as **Milestones**.

Project Management

Deliverables, Milestones

Example: Underground soil moisture sensors for precision agriculture



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Deliverables, Milestones

Example: Underground soil moisture sensors for precision agriculture

Table of Deliverables

D#	Title	Type	Delivery date
D1	Platform; prototype	Prototype	April 30
D2	Lab tests	Int. report	May 15
D3	On Field tests	Int. report	June 30
D4	Final assessment	Techn. report	July 31

Table of Milestones

M#	Title	Type	Date
M1	Platform; prototype	Prototype	April 30

Project Management

Gantt, PERT

A Gantt diagram is a pictorial description of the WBS that shows the *duration* of all activities, and when Deliverables and Milestones are expected. Useful in the planning phase, and during the course of the project for controlling purposes.

A PERT (Program Evaluation and Review Technique) diagram is a pictorial description of the *interrelations* between the different project activities. It aims at supporting the project manager in the planning and execution phases, for the determination of the minimum project duration and the **Critical Path**.

Project Management

Gantt, PERT: Example

Organising a group week-end in Venice.

		D1	D2	D3	D4	D5
WP1 - Travel	T1.1 - Choice from timetable	■				
	T1.2 - Ticket				■	
	T1.3 - Baggage					■
WP2 - Hotel	T2.1 - Choice	■				
	T2.2 - Booking & Payment				■	
WP3 - Finances	T3.1 - Assessment	■				
	T3.2 - Gathering of funds		■	■		
WP4 - Cultural	T4.1 - Choice of events	■				

Project Management

Gantt, PERT: Example

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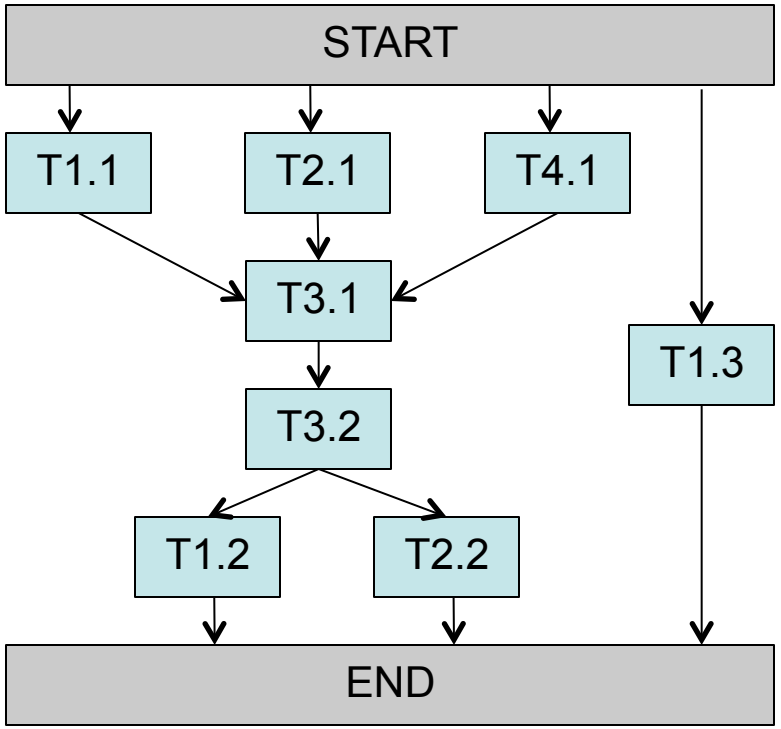

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Gantt, PERT: Example

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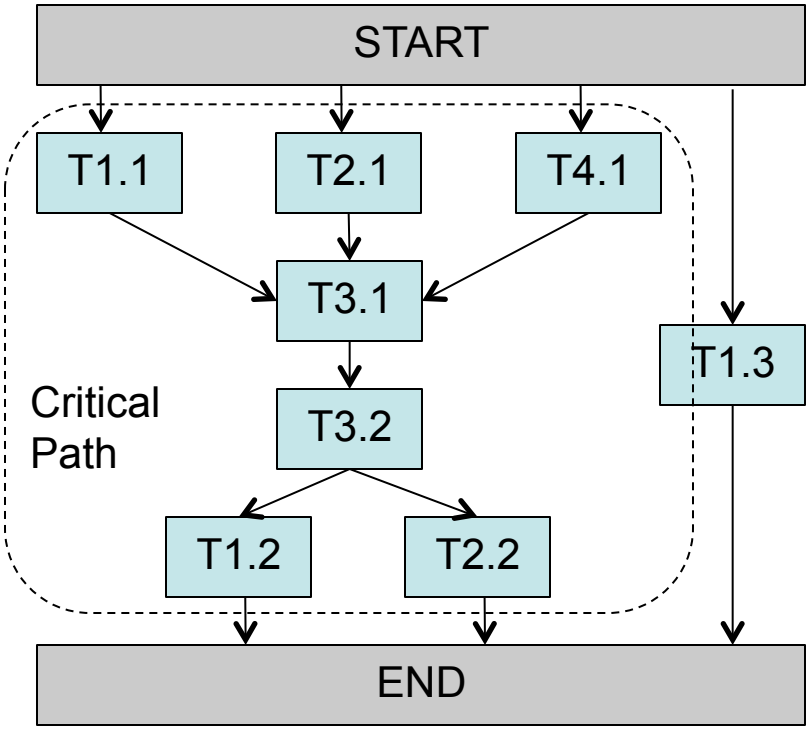

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Interactive Session #2 − Teams of 3 | 30 min

Submit a proposal for financial support to the Ministry.

Your company intends to invest on new equipment; you hear of a financing opportunity offered by the Ministry. For the proposal (you have one month of time), you need to submit: i) ten pages describing in detail the company profile, its organisation (owners, roles...) and strategy, and the equipment to buy; ii) offers from three equipment providers; iii) an excel file showing financial data and market forecasts, proving that breakeven will be reached by three years; iv) the minutes of a board meeting with approval of all documents; v) proof of payment of admission fee via bank transfer.

Prepare a WBS, Gantt and PERT. Include table of deliverables.

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Interactive Session #2

Any team presenting their outcome ?

Project Management

During the interactive sessions, did you feel more comfortable in:

- **analysing the problem and identifying the WBS, or**
- **planning the activities required (Gantt and PERT), or**
- **both?**

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See you next week