

# An introduction to Project Management

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*Seminar lead :*

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University laboratory in urban ecology  
Bee collapse syndrome of urban bees  
200 beehives located on urban roofs  
To date: limited to chemical analyses of honey  
Need for a remote monitoring of the hives:



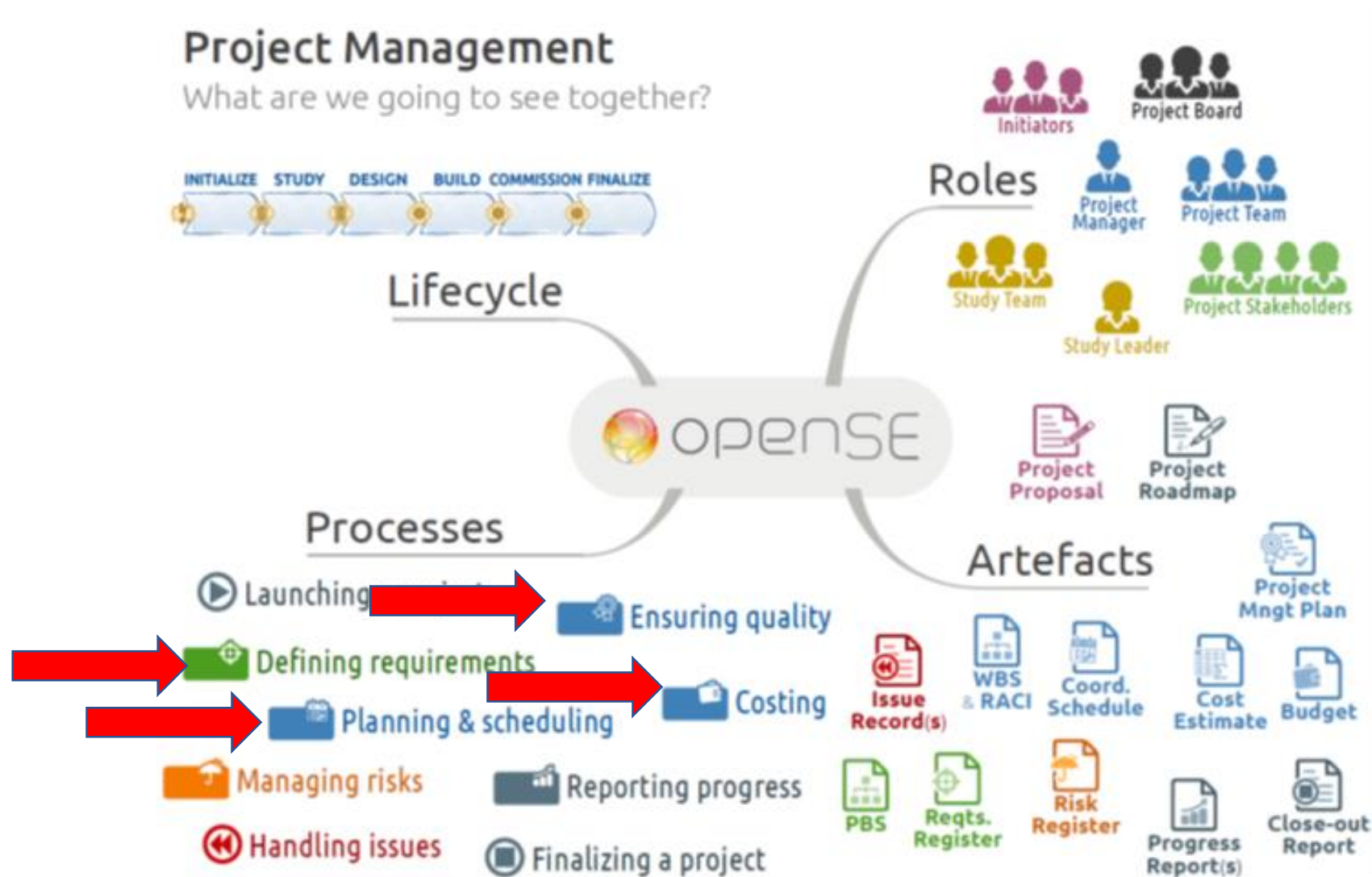
- ➔ Monitoring of the external environment, temperature, NO<sub>x</sub>, etc.
- ➔ Monitoring of the internal environment, temperature, moisture, "activity" (number of bees moving in and out), etc.

Your task: drafting the **Project Proposal** 😎

## Recap from course 1

- ➔ Project breakdown in phases and decision points → **project lifecycle** ✓
- ➔ Roles → **project board** and **project manager** and team ✓
- ➔ **Project Proposal/Roadmap, Project Management Plan** and Reports ✓
- ➔ Technical & safety-related documents → CDR, TRD, etc. ✓

# What



**BONUS !**



**Project Communication**

# Project Communication Plan

Description	Frequency	Method	Audience	Owner
Name of the communication	How often it will happen	Method of communication	Who will receive the communication	Who is responsible
Project team meeting	Daily	Meeting	Project team	Project manager
Stakeholder update	Monthly	Email newsletter	Stakeholders	Project manager
Board meeting	Every two weeks	Meeting	Project board	Project manager
Contribution to department newsletter	Quarterly	Section of newsletter	Wider development	Project manager to deliver to department administration



## Wake up Exercise !

Lucky YOU ! Your boss has authorised your charter and you have been nominated as the project manager for the project. Now you need to brief the team during an opening meeting. What do you do ?



# Wake up Exercise !

The HUMAN factor comes first !

- ***What do I love most***
- ***What can I bring to this team***
- ***What gives me most energy***
- ***What takes the most energy away from me***

# Key Concepts

- Written
- Spoken
- Formal or informal
- Through gestures
- Through Media
- Choice of words

# Examples



# What will we further discuss today ?

## Project quality management

- Project Plan
- Quality assurance
- Quality control

## Project scope management

Work breakdown structure

## Project schedule management

Schedule tasks

## Project costs

# Project Quality Management

PMI is using this term for activities that are undertaken so that the project satisfies the needs for which it was undertaken

3 processes :

- Plan Quality Management
  - Identifying quality requirements or standards for the work
- Manage Quality
  - Translating the quality management plan into executable quality activities, it is about managing the quality processes
- Control Quality
  - Monitoring and recording, its about comparing the works results against quality requirements

## Quality at a glance

Quality Planning

Quality Assurance

“

I say what I will do

Someone checks that it is appropriate


I do what I have said

I provide evidence of compliance

”

Quality Control

# Quality planning

- ➔ Standards related to the SE / NPD **project management**  
e.g.: ISO 21500:2012 or ANSI PMBoK 5<sup>th</sup> ed. or  OPENSE
- ➔ Standards related to the NPD **engineering processes**  
incl. PLM, CAD systems, geometrical tolerancing, etc.
- ➔ Standards related to the **product/system** to develop itself  
in the fields of materials, of communication, of energy, of interfaces,  
of software, of reliability, of availability, of maintainability, of safety, etc.
- ➔ Standards related to the **manufacturing and assembly processes**  
incl. supply chain, plant engineering, etc.




# Project Management Plan

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# Project Management Plan

- ➔ The “**entry point**”  to project information
- ➔ The aim of the PMP is twofold:
  - ➔ Ensuring that the project participants agree upon and share a common framework for organizing their project
  - ➔ Giving the project board the assurance that the project expectations are well understood and that everything is done to ensure the operational success of the project
- ➔ A few possible approaches depending on the project participants maturity level w.r.t. project management processes

# Project Management Plan - TOC

Typical Table of Contents  
Simple Approach

- 1 **Project Overview** PMP Scope + Reformulation of the Project Roadmap
- 2 **Project Organization** Project Board, Project Team, roles, OBS
- 3 **Project Management Processes**
  - 3.1 **Scope Management** WBS, Work Packages, Work Units, Activities
  - 3.2 **Time Management** Master and Coordination Schedules
  - 3.3 **Resource and Cost Management** Manpower, budgeting, EVM
  - 3.4 **Quality Management** Document management, V&V, configuration management, issue and non conformity handling
  - 3.5 **Communication Management** Meetings, reporting periodicity
  - 3.6 **Risk Management** Project Risk Register, Project Continuity Plans
  - 3.7 **Procurement and Contribution Management** Ordering, contracting
- A **Applicable Standards**

## Hot Dogs

### Big Moe's Classic Big Dog

A perfect chicken sausage in a freshly baked hot dog bun. Topped with Swiss cheese and served with Big Moe's hand-cut chips. \$5.50

### Big Moe's BBQ Big Dog

A perfect dog with a jerk chicken sausage, smoked chicken paprika, fresh onions, barbecue sauce and cheese sauce, served with Big Moe's hand-cut chips. \$5.50



## Corn Dog

MOVING MOUNTAINS

### Corn Dog - NEW

Unusually delicious, the corn dog is an American innovation at its best. Try our vegan version with a moving mountain sausage and we know you will be back for more. Served with Big Moe's hand-cut chips. \$3.95

## Chicken 'n' Waffle

### Chicken 'n' Waffle

The all-American classic Buffalo chicken wings, bread-crusted, bread served on a Buffalo waffle with a side of maple sauce. \$5.50

## Chicken

### STEP 1 Choose size:

Quarter Chicken + 1 Side \$5.95

Half Chicken + 2 Sides \$6.75

### STEP 2 Choose your sauce or glaze:

Plain, BBQ or Medium Post Pair

### STEP 3 Choose your sides:

- Coleslaw
- Corn on the Cob
- Big Moe's Chips
- Cash-Own-Rings
- Big Moe's Garlic Bread
- Big Moe's Cheesy Chips - add \$1.25
- Big Moe's Wash Potatoes
- Big Moe's Garlic Mash Potatoes



## Ribs

Our famous BBQ ribs expertly cooked, fire-grilled and glazed with our Big Moe's barbecue sauce, and served with Cajon onion rings and Big Moe's hand-cut chips.

Big Moe's Full Rack of Lamb Ribs \$23.95

Special Deal

Big Moe's Half Rack of Lamb Ribs \$17.95



## Mac 'n' Cheese

### Mac 'n' Cheese - NEW

Special Deal

Loaded by people of all ages, a pleasing hot bowl of pasta and melted cheese, sprinkled with breadcrumbs, a hint of cayenne pepper and topped to serve. \$5.25



TASTE OVERLOAD! EXTRA SAUCES			
BIG MOE'S SAUCE	1.50	BIRDMANOLI	1.50
BBQ SAUCE	1.50	SPICY MAYO	1.50
SARIC SAUCE	1.50	TANDOORI SAUCE	1.50
SOON CHINESE SAUCE	1.50	SWEET CHILI	1.50
BBQ SAUCE	1.50		

## Steaks

Let your server know how you like your steaks. All steaks are available plain for the simple tastes in life, or choose to SPICE IT UP with a Cajon marinade.

### STEP 1

Choose your steak and tell us how you like it

T-Bone 14oz / 28oz \$29.95

8oz Eye 8oz / 28oz (Porterhouse) \$19.95

Steak 8oz / 28oz \$15.95



### STEP 2 Choose your sauce or glaze:

Plain, BBQ, Wash Potatoes or Post Pair

### STEP 3 Choose 2 sides:

- Coleslaw
- Corn on the Cob
- Big Moe's Chips
- Cash-Own-Rings
- Big Moe's Garlic Bread
- Big Moe's Cheesy Chips - add \$1.25
- Big Moe's Wash Potatoes
- Big Moe's Garlic Mash Potatoes



## Beverages

## Classic Shakes

Smooth and Creamy Ice Cream Shakes

Vanilla	4.75
Chocolate	4.75
Strawberry	4.75
Banana	4.75
Sublime	4.75

## Malt Shakes

The all-American Refreshing Malt

Chocolate	4.95
Vanilla	4.95
Butterscotch	4.95
Peanut Butter & Banana	5.25
Peanut Butter & Chocolate	5.25

## The Ultimate Range



### Lemon Shakes - NEW

A tangy combination of zesty lemon flavored by that lemon and creamy vanilla ice cream. This shake is the creamiest to try at \$5.50

### Strawberry Banana Shakes

For you love, because it's a mix of strawberry ice cream and a range of strawberries in cream. Served topped with a fresh banana and fresh strawberries to create a perfect milkshake. \$5.50

### Cookie Dough Shakes - NEW

Chocolate chip cookie dough - softness with chocolate pieces of creamy cookie dough blended with creamy vanilla ice cream to create a heavenly treat on the traditional milk and cream. \$5.50



## Choc Bar Shakes

Revisit yourself with one of our legendary Cheesecake Bar or Mocha Shakes

Famous Mocha	4.95
Slender Mocha	4.95
Slender Mocha White	4.95
Liquid	4.95
Salted Caramel	4.95
Flavor	4.95
Beau Cookie	4.95

## Soft Drinks

Coca Cola (regular size price applies)	2.75
Diet Coke	2.50
Coke Zero	3.00
Fanta	2.50
Sprite	2.50
Fruit Smoothie	3.95
Mineral Water	2.95
Mineral Water (hot)	3.45

## Soda Floats

ADD AN EXTRA CHOCOLATE SAUCE FOR \$1.00

Classic Coke Float	3.95
Choc Coke Float	4.95
Super Lemon Float	3.95
Strawberry Float	3.95
Cream Soda	3.95

## Juices

Apple Juice	3.95
Pineapple Juice - NEW	3.95
Orange Juice	3.95



## Pina Colada

ADD AN EXTRA CHOCOLATE SAUCE FOR \$1.00

Pina Colada - NEW	4.95
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Lemonade	4.25
Mint Lemonade	4.25
Raspberry Lemonade	4.25
Strawberry Lemonade - NEW	4.25
Mango Lemonade - NEW	4.25

## Ciders

Available from

Strawberry and Lime	4.95
Kopparberg - NEW	4.95
Mead Fruit Kopparberg - NEW	4.95



## Coffee

Espresso	2.25
Cafe Latte	2.25
Espresso Tea	2.25
Americano	2.25
Mocha	3.25

## Beers

Available from

Ginger Beer - NEW	4.75
Beet Beer	4.75
Weihen 5.0 - NEW	5.25
Smoked Prohibition	4.95



## Hot Drinks

Hot Chocolate	4.95
Choco English Tea	3.95
Green Tea	3.95
Mint Tea - NEW	2.95

# Project Management Plan - Editorial

## Editorial Process

- ➔ **Authoring:** Project Manager  + a few Key Project Participants
- ➔ **Verification:** Some other Key Project Participants + some Project Management Experts (e.g. members of the PMO)
- ➔ **Validation:** Project Manager 

# Project Management Plan - template

Unique ID    Version    Status    Date  
**101**      **0.3**      **DRAFT**    2014-02-22

## the whatever project



### PROJECT MANAGEMENT PLAN

Authored by:      Verified by:      To be validated by:  
 Alberte            Cyprien            Ernest  
 Barnabé            Denise

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Unique ID	Document title				
	Ver.	Date	Authored by	Verified by	Validated by
100	Project Roadmap				
	0.1	2014-01-13	Alberte		
	0.2	2014-01-20	—	Ursule, Yvone	
	1.0	2014-01-22	—	—	Xavier, Zélie
101	Project Management Plan				
	0.1	2014-02-05	Alberte, Barnabé		
102	Project Work Breakdown Structure				
103	Project Cost Estimate				
104	Project Budget				
105	Project Master Schedule				
	0.1	2014-02-07	Alberte, Cyprien		
106	Project Coordination Schedule				
107	Project RACI Matrix				



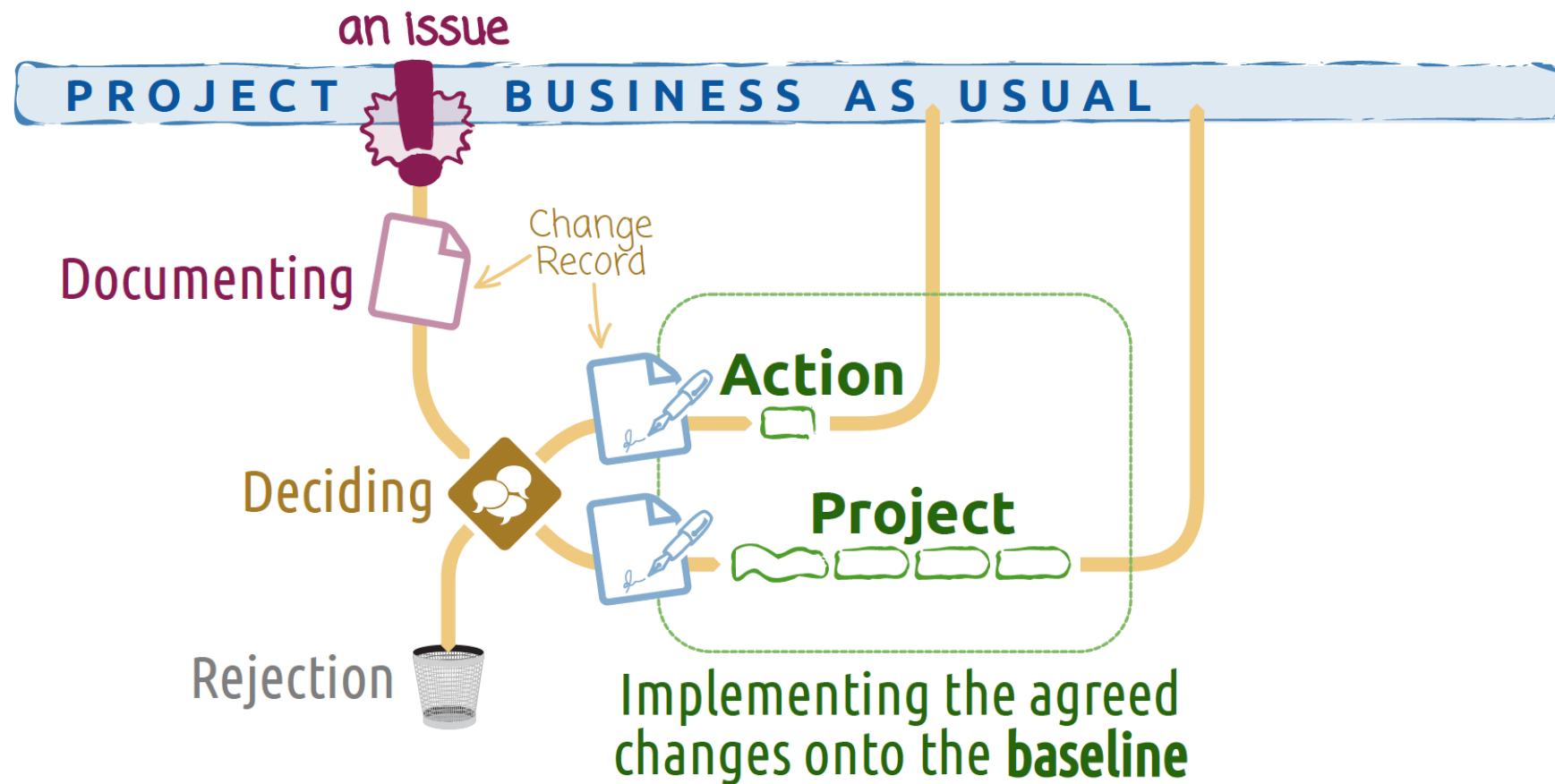
# Issue Management System

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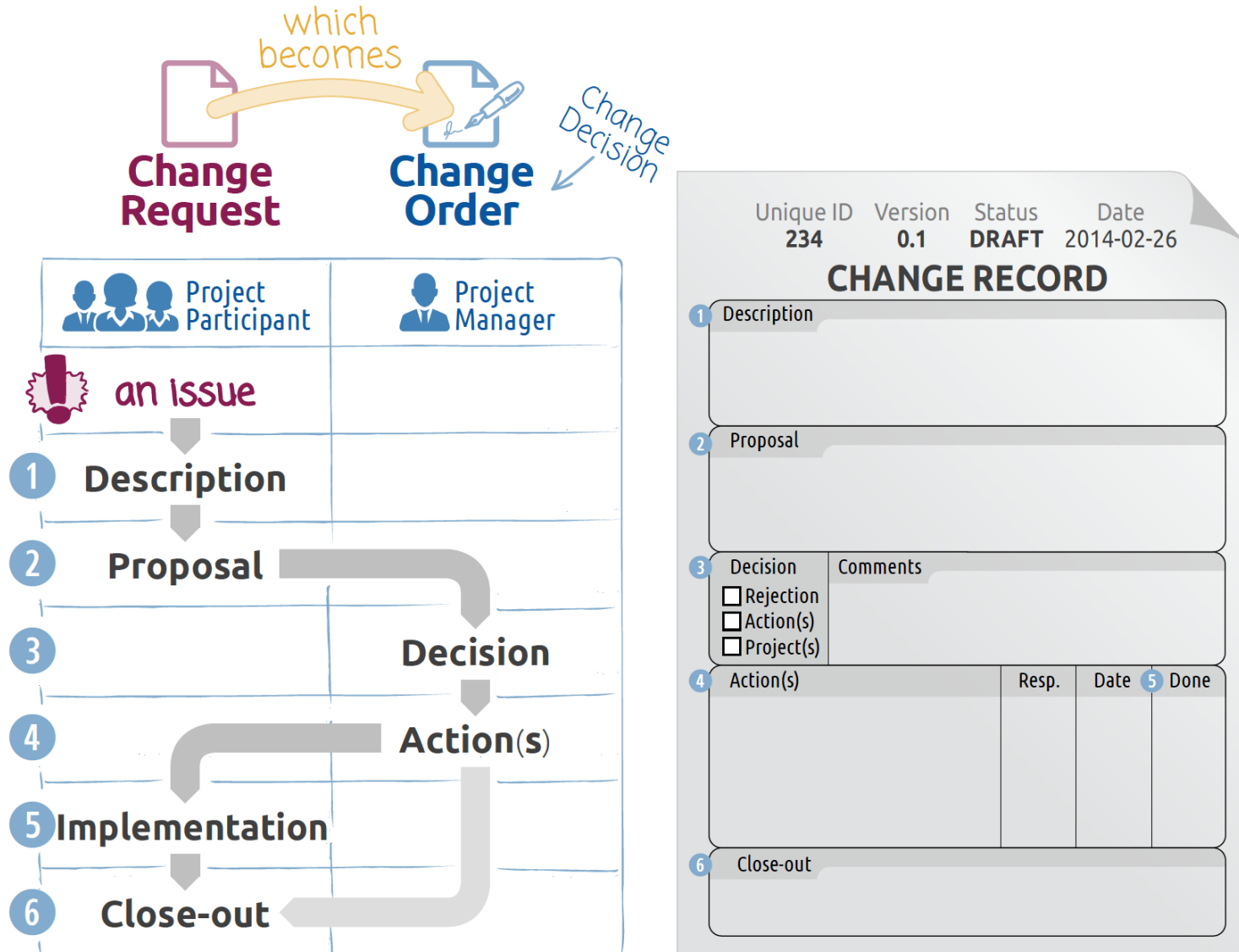


# Issues always come up !

Change Records (**CR**) featuring requests and orders



# Change record







# Quality Control



# Quality Assurance vs Quality Control

<i>Quality Control</i>	<i>Quality Assurance</i>
	
<i>Focused on Product</i>	<i>Focused on Process</i>
<i>Reactive</i>	<i>Pro-active</i>
<i>Line Function</i>	<i>Staff Function</i>
<i>Finds Defects</i>	<i>Prevent Defects</i>
<i>Testing</i>	<i>Quality Audits</i>

# Control Quality

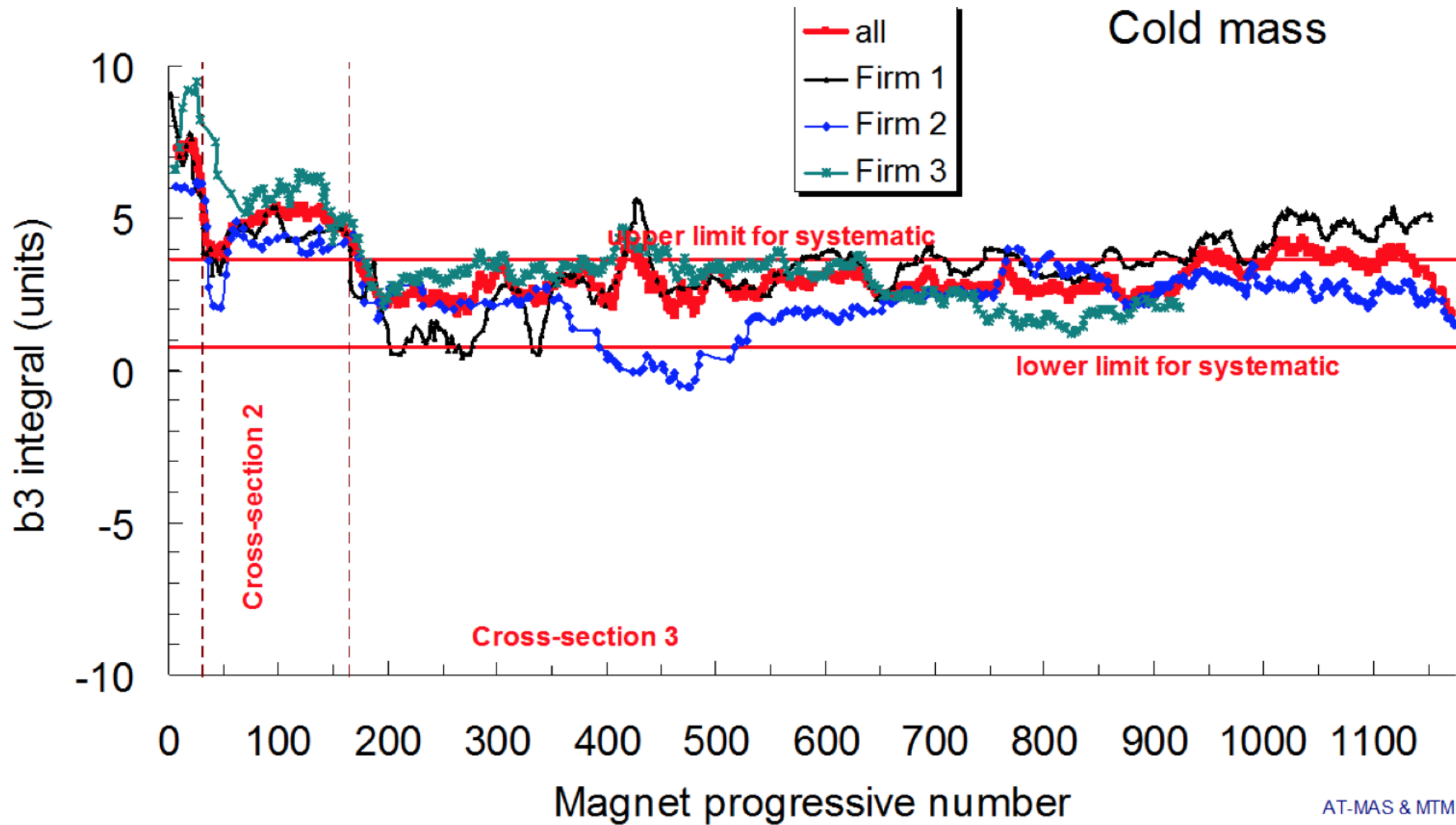
This is about putting in place all control procedures

- Monitor work results against the baseline
  - Prevention (process) and inspection (product)
- Analyse the deviations
  - Identify root cause
  - Examine alternatives
  - Change if needed
- Take corrective actions
  - Secure authorisation
  - Monitor Results
- Document Actions and update plans

Sample Check Sheet used in a Precast Yard

Type of defect	Mon	Tue	Wed	Thu	Fri	Sat	Total
Chipped edges	###						19
Surface cracks			###				12
Structural cracks							4
Insufficient cover							8
Poor finish				###			6







**OPERATIONS > SAFETY**

# Airbus Admits 'Assembly Quality Problem' after A400M Crash

# What will we discuss today ?

## Project quality management

- Project Plan
- Quality assurance
- Quality control

## Project scope management

Work breakdown structure

## Project schedule management

Schedule tasks

## Project costs

## Requirements engineering





## Balancing act

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**WE OFFER 3 KINDS OF SERVICES**

**GOOD-CHEAP-FAST**

**BUT YOU CAN PICK ONLY TWO**

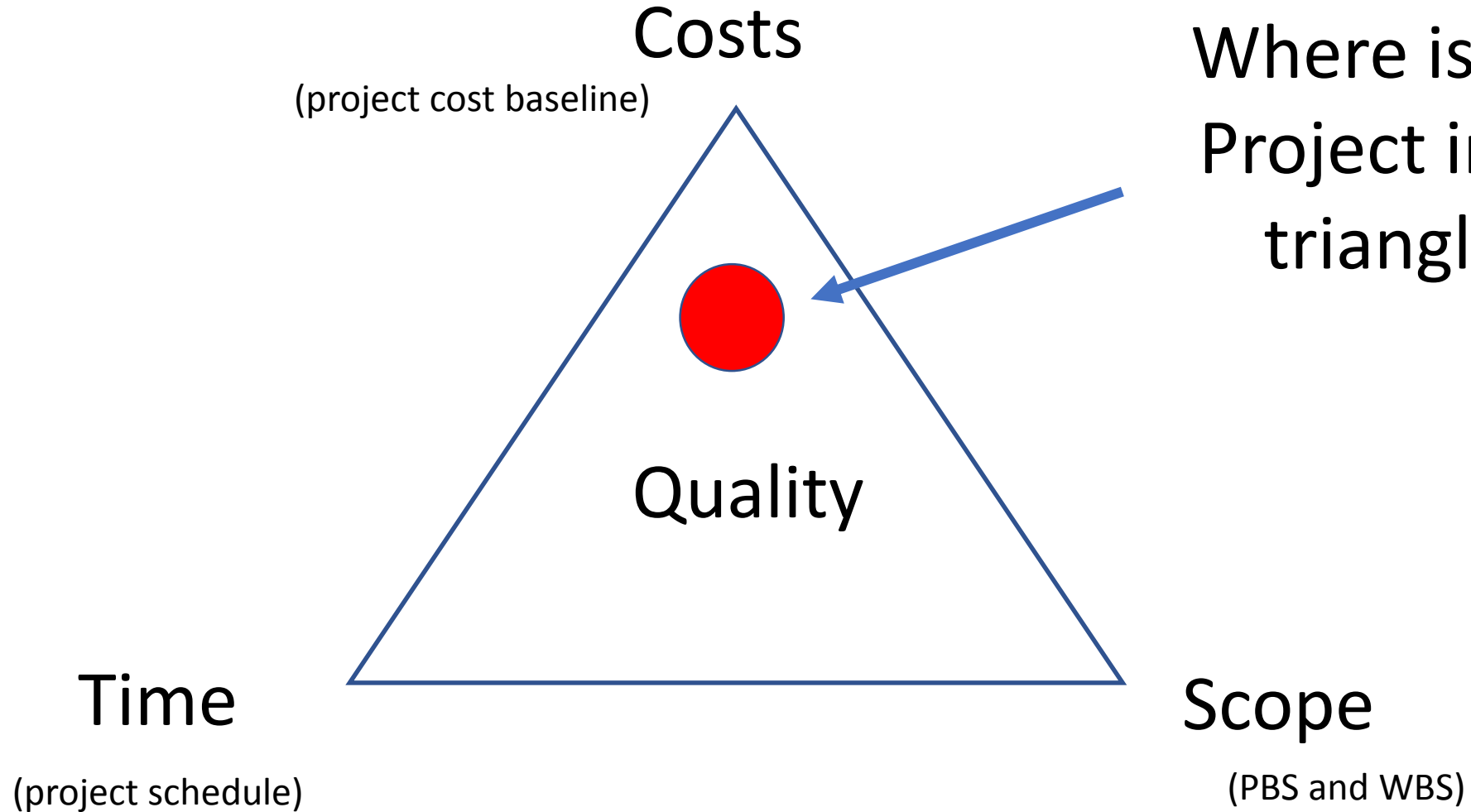
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**GOOD & CHEAP** WON'T BE **FAST**

**FAST & GOOD** WON'T BE **CHEAP**

**CHEAP & FAST** WON'T BE **GOOD**

# Iron triangle of Project Managers



Where is Your Project in the triangle ?

# Project Scope



# Key Concepts

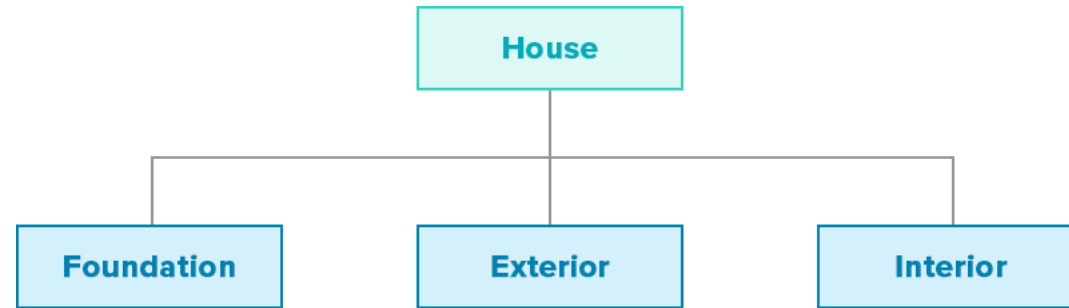
## **Product Scope**

*This concerns the service, product or idea that is the output of your project*

## **Project Scope**

*This concerns the work performed to produce the product, service or idea*

# Breakdown of product scope

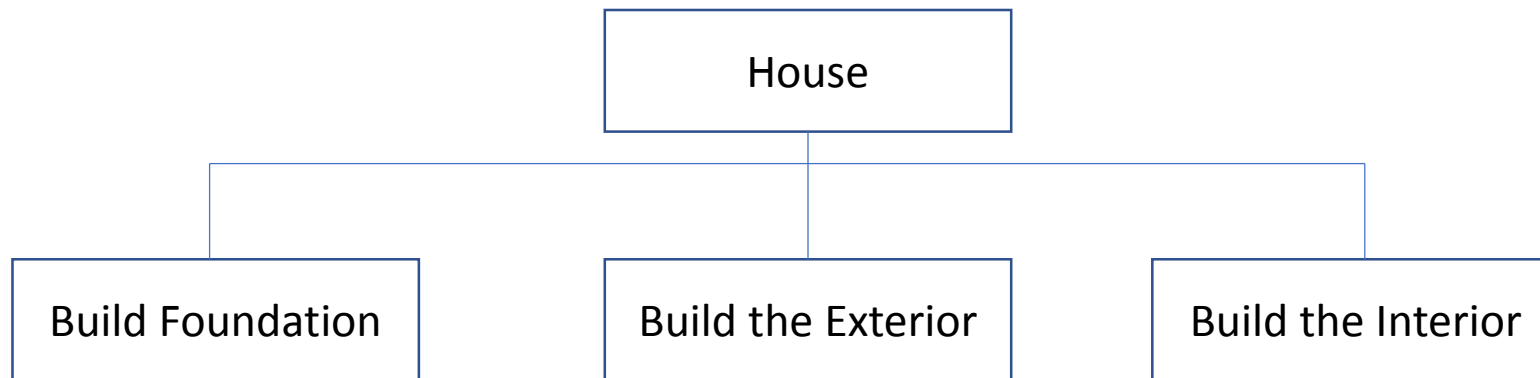


*Product Breakdown Structure - PBS*

# Breakdown of the work to be performed

The work breakdown structure is a "deliverable oriented hierarchical decomposition of the work to be executed by the project team."

## VERB + NOUN



*Work Breakdown Structure - WBS*

# Breakdown of the work to be performed

## 1 Identifying the project **activities** → analytical approach

### ? What is an **activity**?

▶ ≠ deliverable! ← a.k.a. **work unit**

To avoid confusion, clever professional practices (e.g. MIL-HDBK-245B + appendix A) and several textbooks suggest to label activities as follow:

▶ **action verb** (infinitive tense) + **noun**

An **activity**:

- ▶ consumes **time**
- ▶ consumes **resources**
- ▶ has **start** and **end** dates
- ▶ creates (a) **deliverable(s)**
- ▶ is **measurable**
- ▶ is **assignable** to one project participant ← and only one!

Some examples:

Manage the project  
Prepare PM documents  
Perform detail design of wing surface  
Supply rope & straps  
CFT for moulded ABS parts



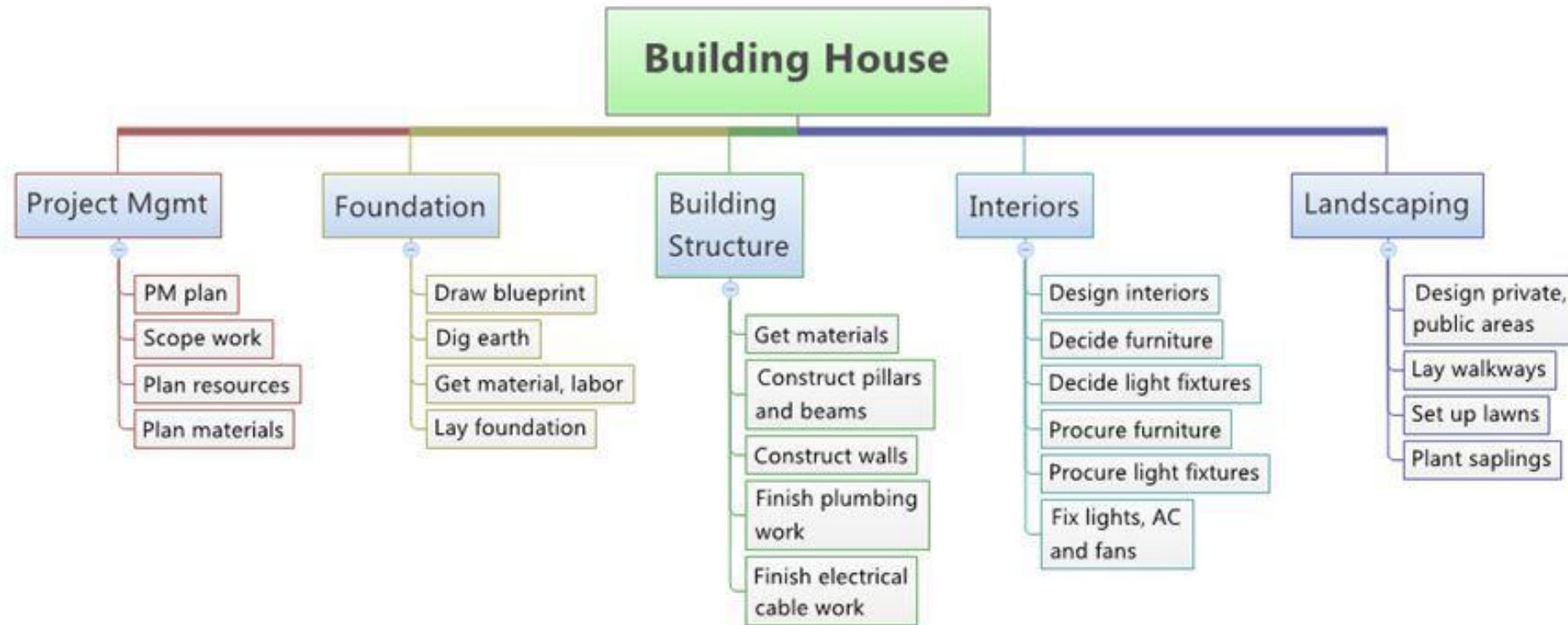
# Develop WBS

## Present Situation :

*Dad has found a new job in New Zealand. The family (Mum, Dad, 2 kids (7 and 16 years old)) decide to emigrate and Mum, who is working in retail, has to find a new job too in New Zealand. Their dog is of course coming along. The kids have to change schools and learn the language. The family has to find a new place to live and has to decide what to do with the present house they live in (they are house owners). They will all need residence permits for NZ and they have to check if their vaccinations are still in order and sufficient. They will also have to arrange all administrative matters and ensure they have a bank account and social security number before Dad is starting with his new job.*

**Exercise : Identify Project Phases and Establish the Work Breakdown Structure for the project 'Move and Change country with my family'**

# WBS Example



Source : <http://houseconstructionborimuko.blogspot.com/>

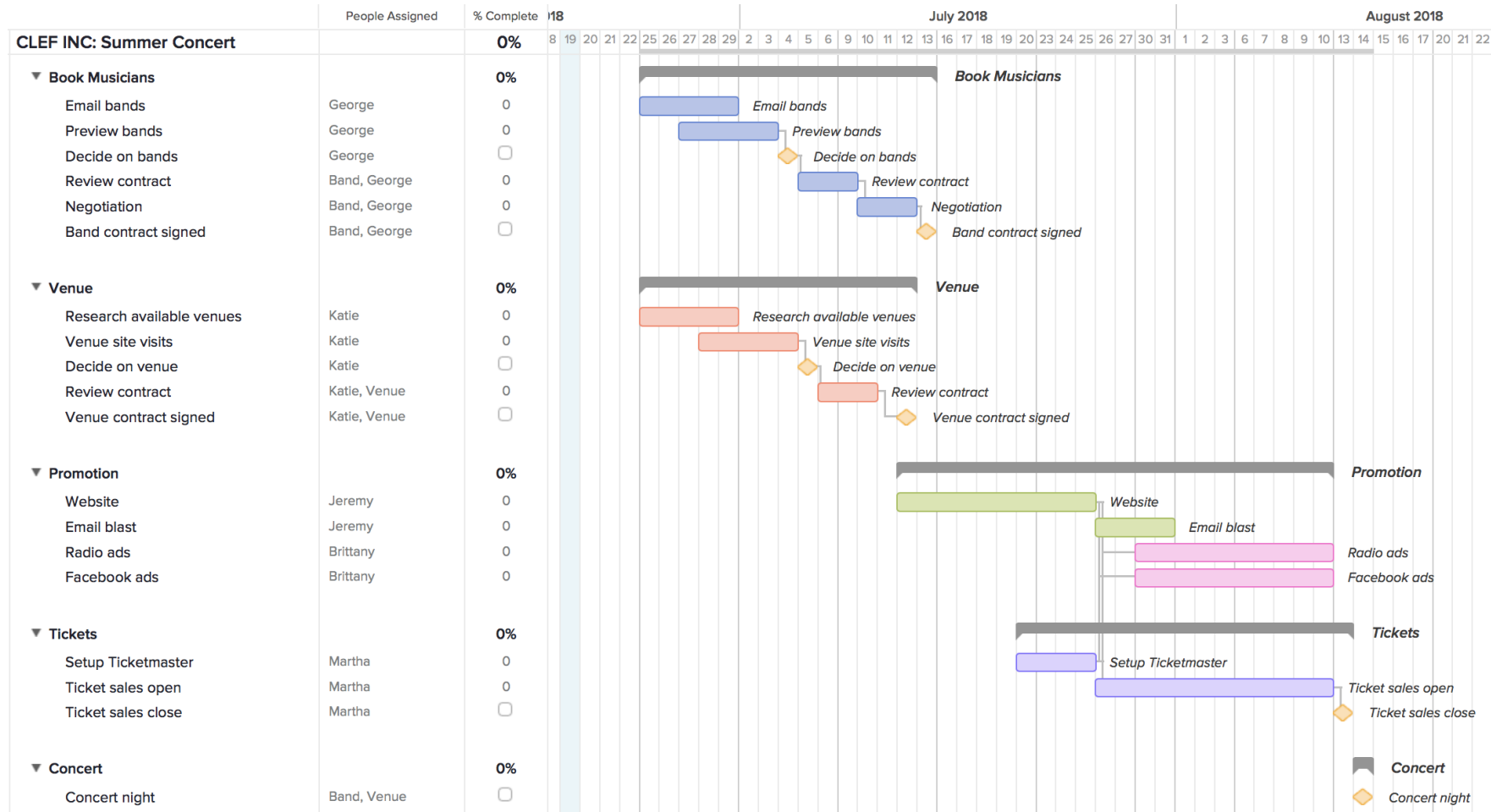
# Project Schedule



# Sequence Activities

- Put the elements of the WBS in a logical sequence
- There are 4 types of dependencies :
  - Mandatory (inherent to deliverable)
  - Discretionary (defined by management team)
  - External (relation with non-project activities)
  - Internal (defined by management team)
- Sequencing means finding a logical input-output relationship between tasks

# Graphical presentation



# Project Costs



# How to estimate costs ?

There are 4 types of cost estimation :

- Parametric
- Bottom-up
- Analogous
- Contractor Bid Analysis

The estimation techniques are

- Deterministic
- PERT



# Examples of cost estimation - materials

Category	Description	Activity	Quantity	Unit Price	Cost
Packing Materials	Small Boxes	2.1	10	\$1.70	\$17.00
Packing Materials	Medium Boxes	2.1	15	\$2.35	\$35.25
Packing Materials	Large Boxes	2.1	7	\$3.00	\$21.00
Packing Materials	Extra Large Boxes	2.1	7	\$3.75	\$26.25
Packing Materials	Short Hanger Boxes	2.1	3	\$7.95	\$23.85
Packing Materials	Box Tape	2.1	2	\$3.85	\$7.70
Packing Materials	Markers	2.1	2	\$1.50	\$3.00
Packing Materials	Mattress/Spring Bags	2.1	2	\$2.95	\$5.90
Packing Materials	Lift Straps per Pair	2.1	1	\$24.95	\$24.95
Packing Materials	Bubble Wrap	2.1	1	\$19.95	\$19.95
Packing Materials	Furniture Pads	2.1	4	\$7.95	\$31.80
Truck	Rental	2.2			\$400.00
Truck	Gas at 10mpg	2.2	200	\$2.25	\$45.00

Source : <https://pm4id.org/chapter/9-1-estimating-costs/>

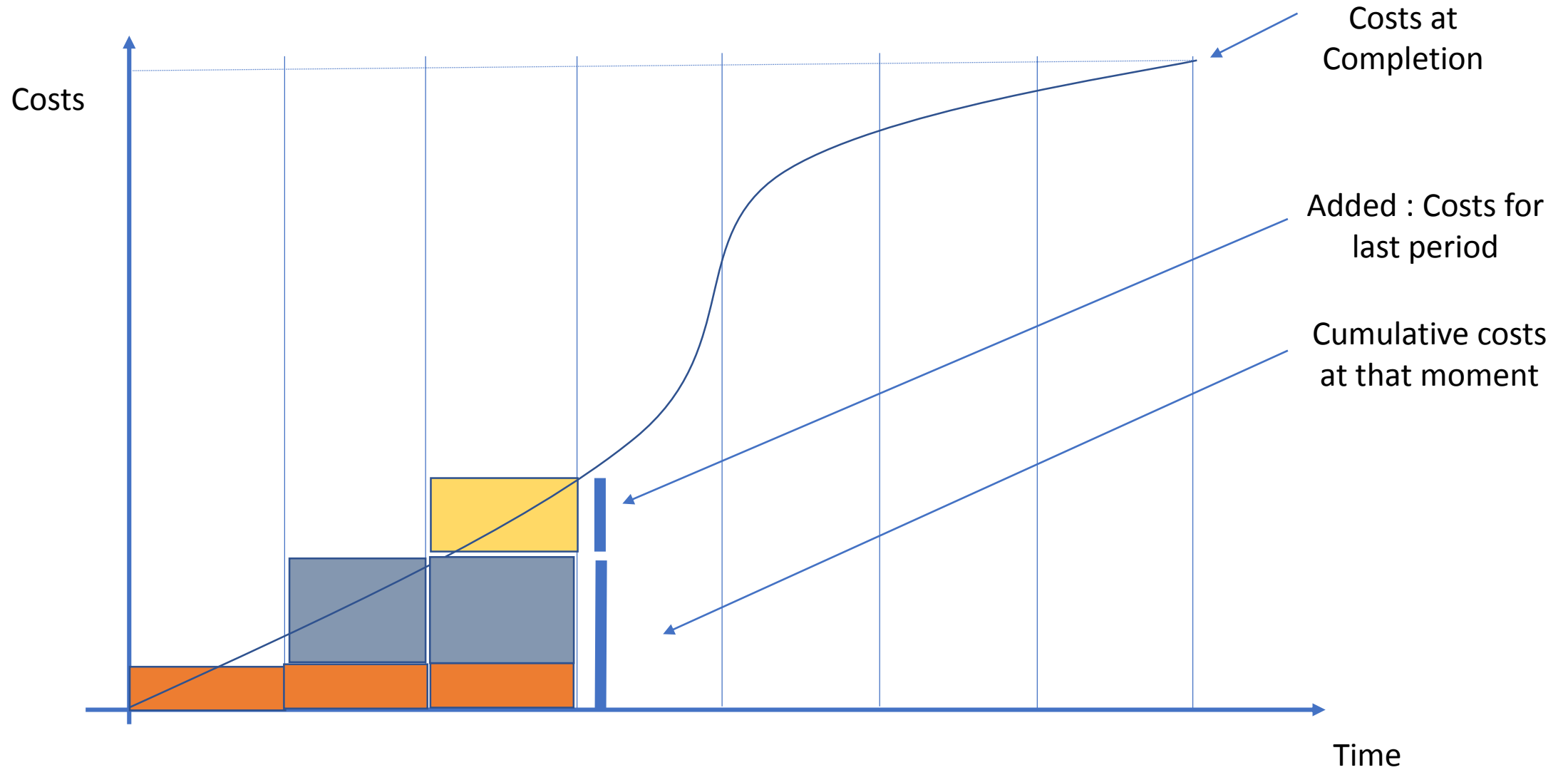


# Determine Project Cost

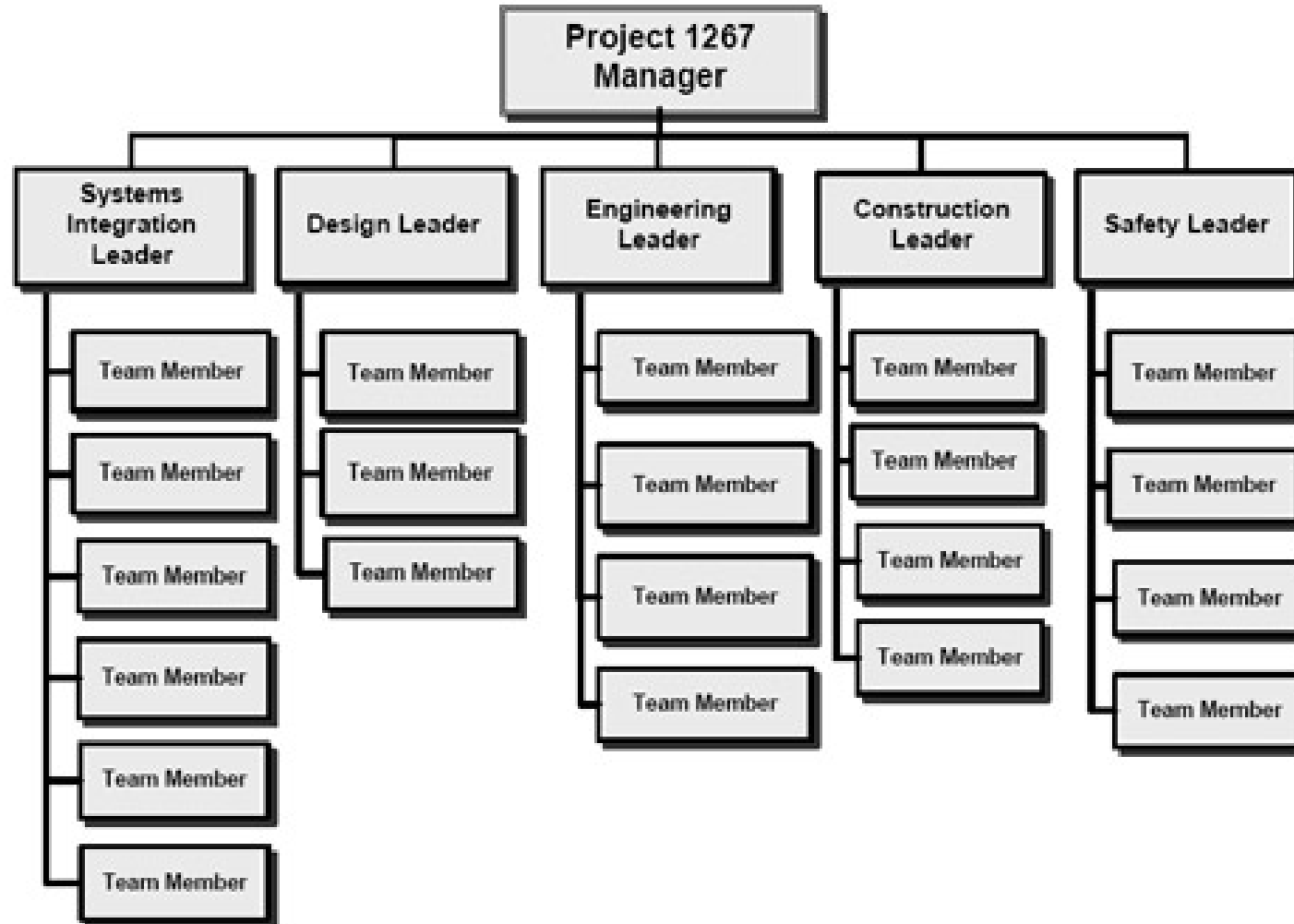
To determine the project cost :

- Aggregate the costs all activities in a work package to get the cost of that work package
- Get the start and end dates of each activity
- Aggregate costs to the calendar periods in which the costs are planned to be incurred
- The risk register with the risk responses can be used to aggregate the risk response costs for a calendar period

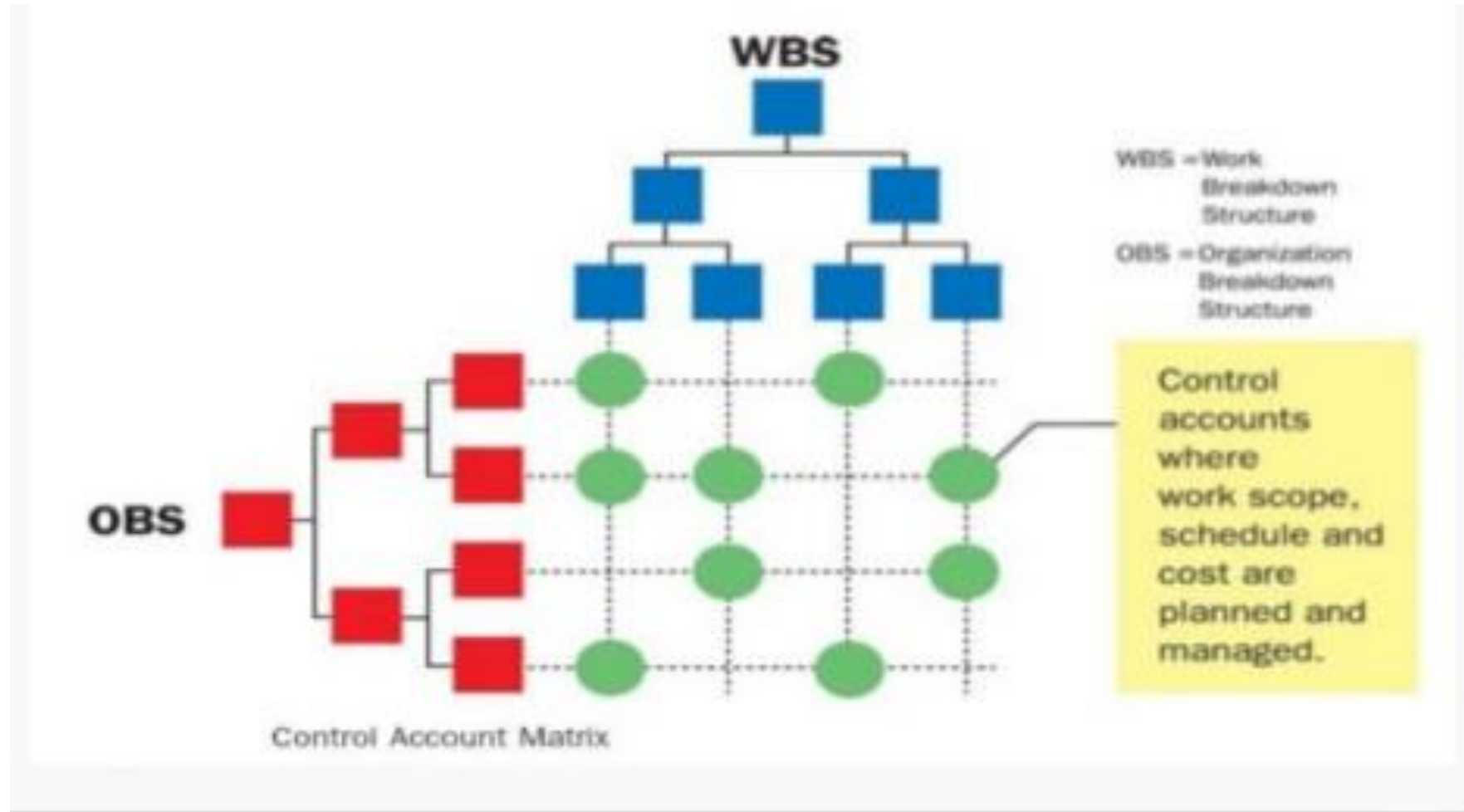
# Graphical presentation – cost baseline



# Organisational Breakdown Structure



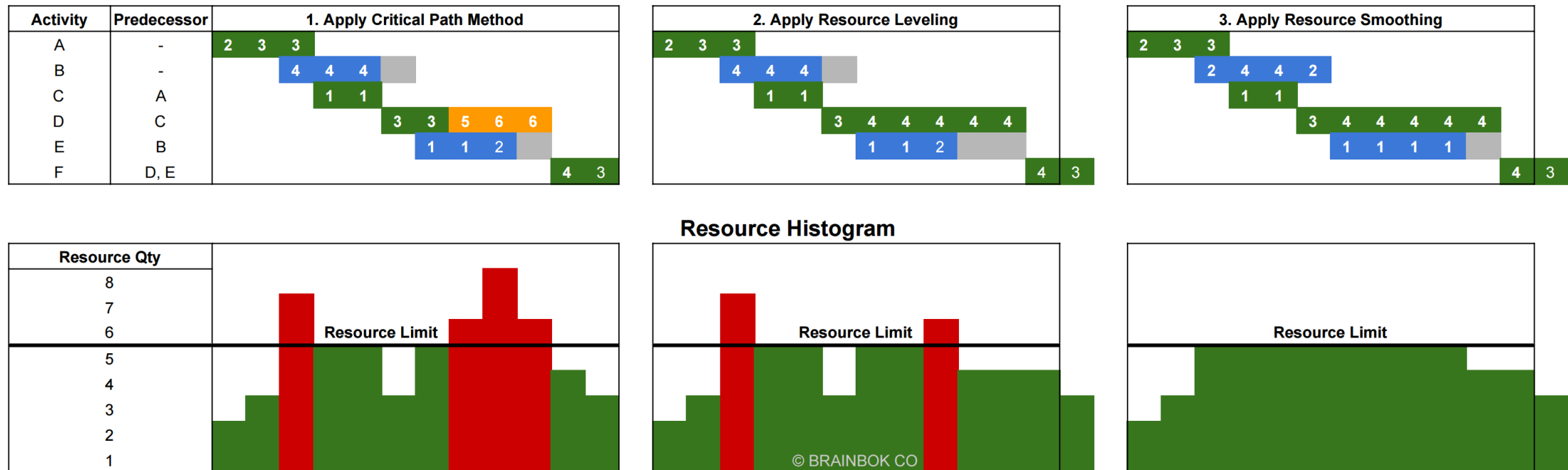
# OBS and WBS



# Resource planning

## Constraints

1. The project cannot have more than 5 resources at any point (predefined resource limit).
2. Only 4 resources are available to work on Activity D at any point (scarce resources).



# Tools – WBS Pro



WBS SCHEDULE PRO

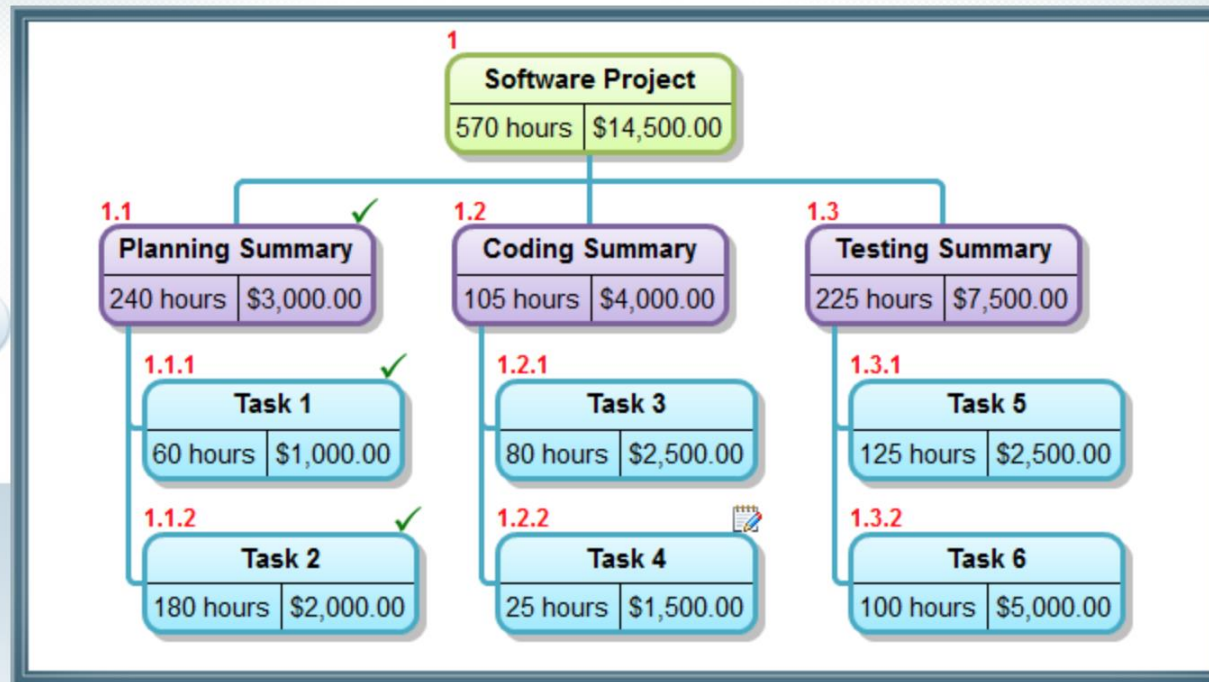
BUY NOW

SUPPORT

COMPANY

CUSTOMER PORTAL

## WBS Schedule Pro



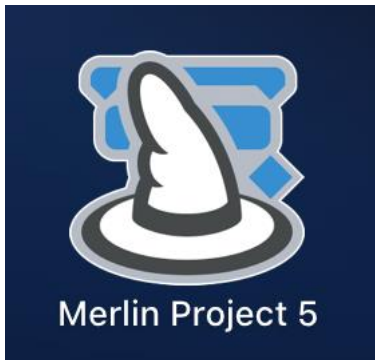
TRY IT NOW



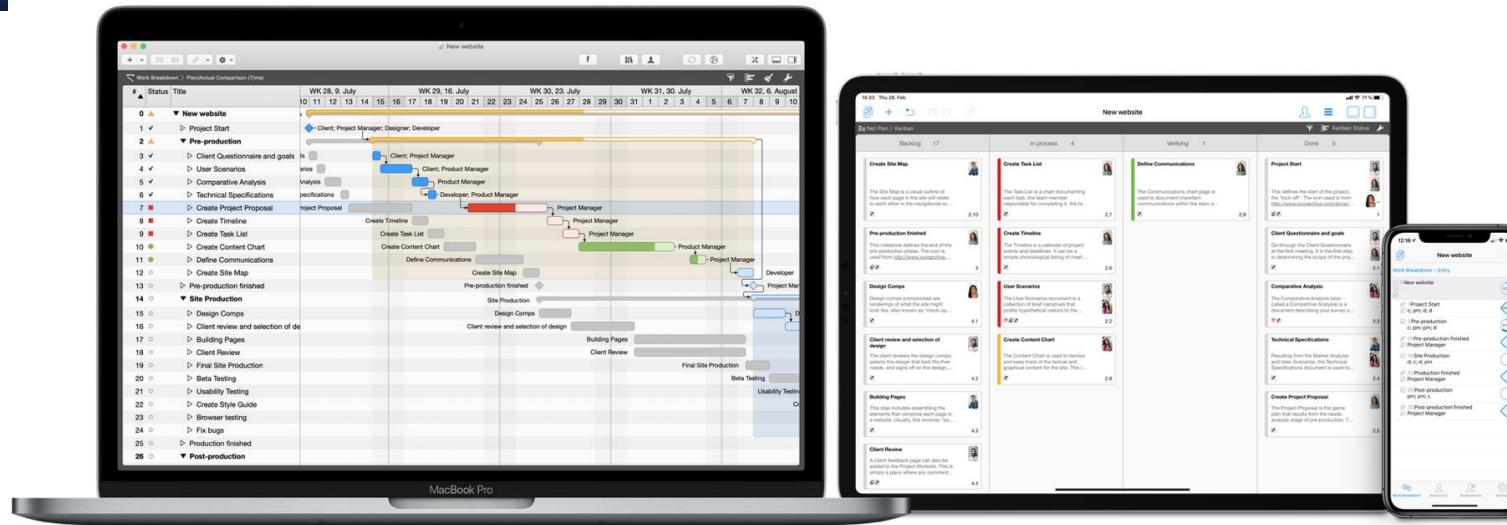
# Tools – sequencing, scheduling

ProjectWizards

Apps Support Industries About us Blog



## Magic Apps for Mac, iPad & iPhone Professional Project Management Software



# Wrap up - introduction to project

## Wrap up

- Project breakdown in phases and decision points → **project lifecycle** ✓
- Roles → **project board** and **project manager** and team ✓
- **Project Proposal/Roadmap, Project Management Plan** and Reports ✓
- Technical & safety-related documents → CDR, TRD, etc. ✓
- Project quality management system and **document handling** ✓
  
- **Planning** and **scheduling** ✓
- **Cost estimating** and **budgeting** ✓





[cern.ch/openSE](https://cern.ch/openSE)

[cern.ch/quality](https://cern.ch/quality)