



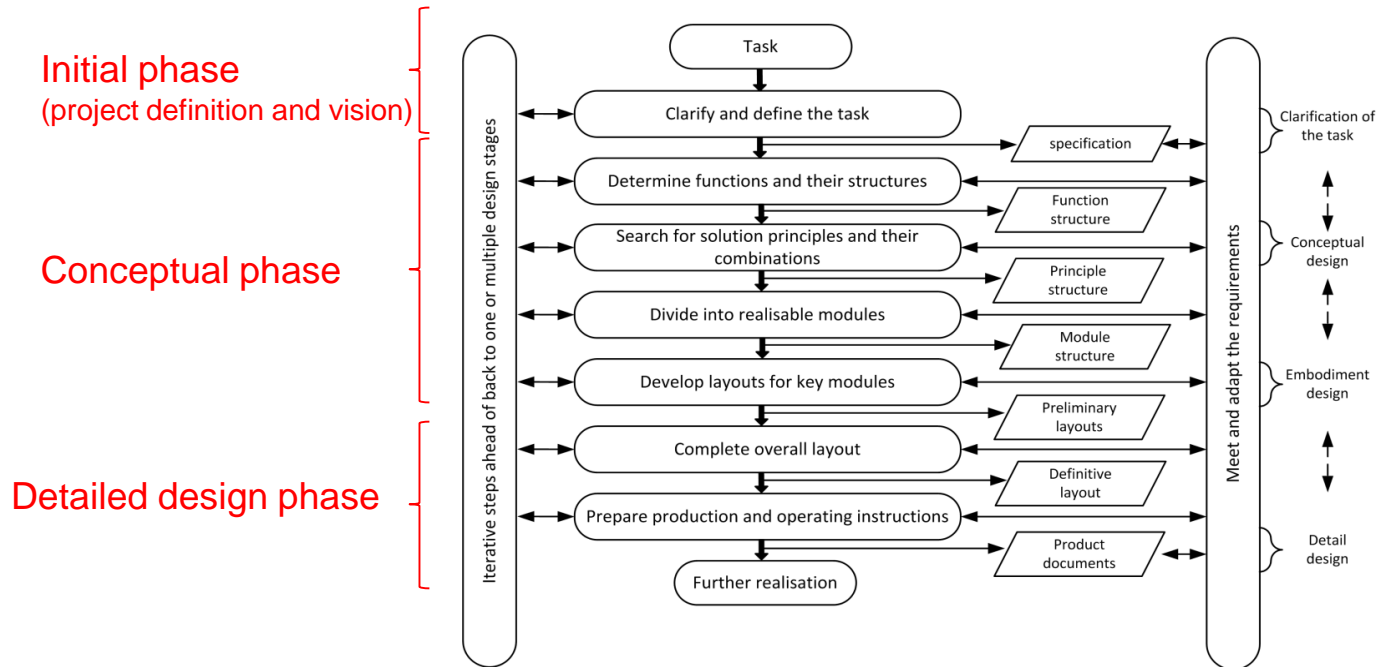
# ELPID 2019

## 2nd project phase: Conceptual phase

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# 2nd phase: Conceptual phase

Engineering design process:

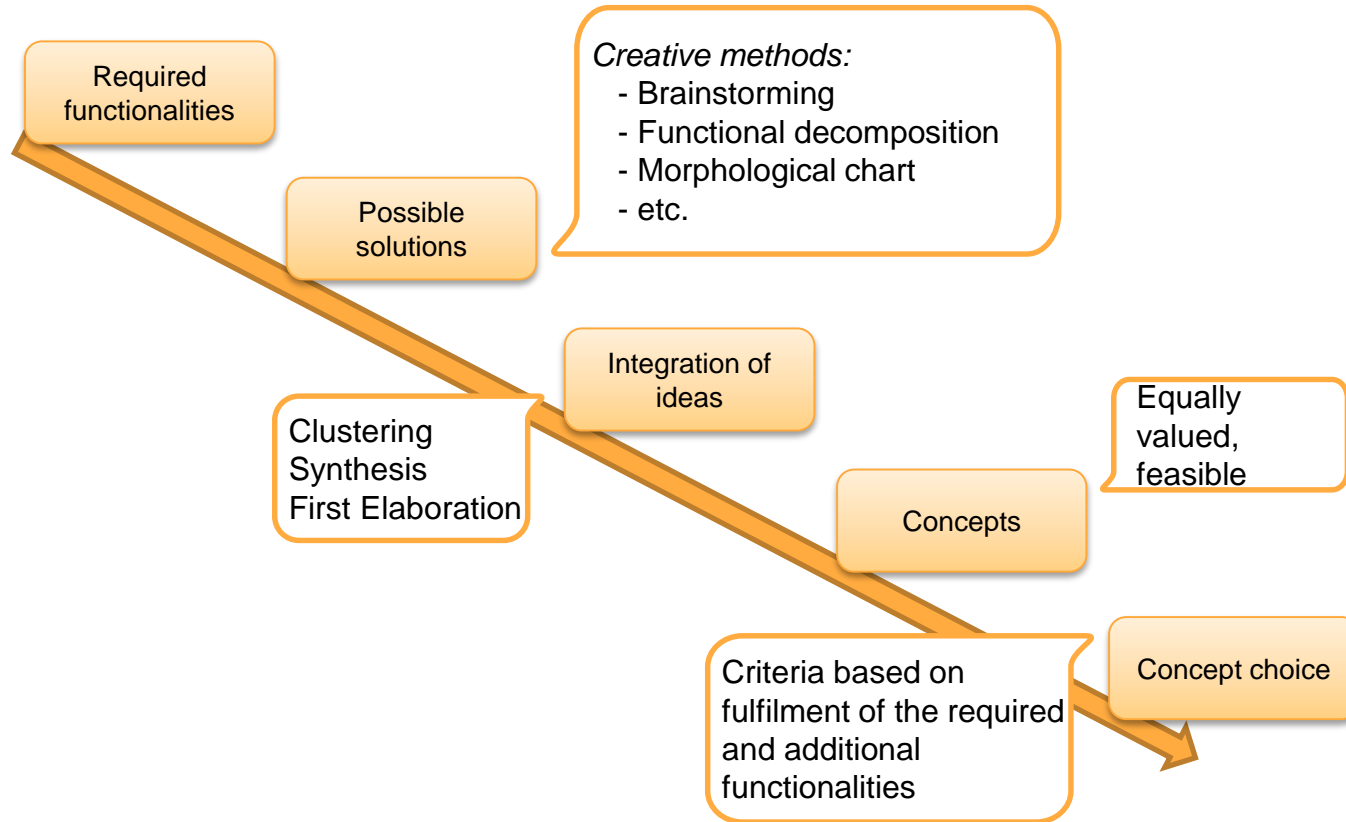


# Deadlines

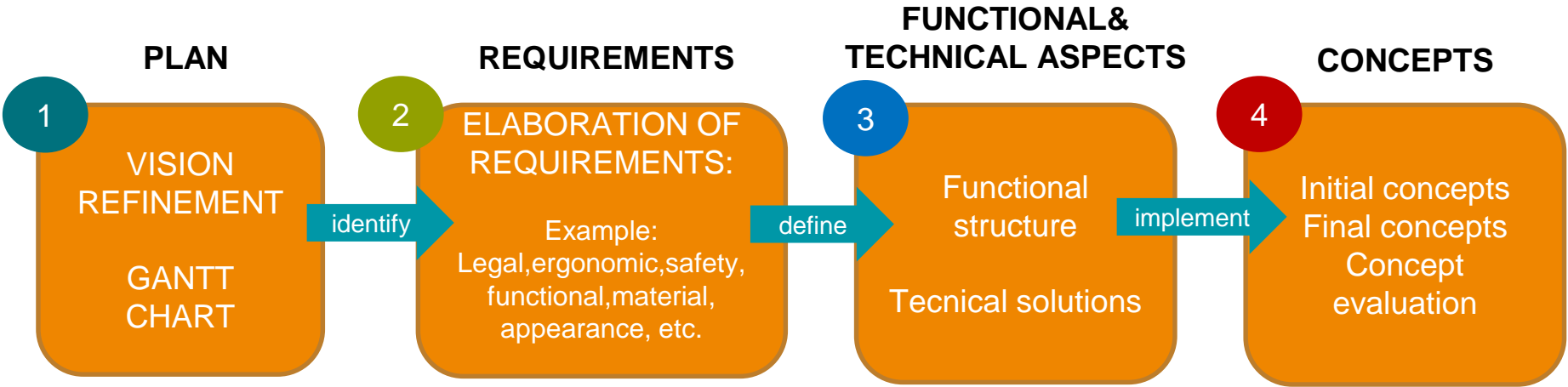
- Report: 30.04.2019.
  - Max.10000 words
- Presentation: 03.05.2019
- Project review: 06.05.2019.

2nd Project review time limit: **5 WEEKS !**

# Creative concept generation

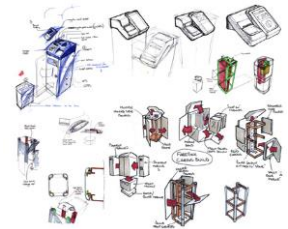


# What we expect from you in 2nd project review?



	Option 1	Option 2	Option 3	Option 4
Vignette: parking device				
Vignette: parking device				
Det. utility device				
Packaging device				
Method of transportation				
Drive means				

Concept 1



1.4. – 7.4.

1.4. – 12.4.

12.4 - 22.4

23.4 - 30.4

1.

**PLAN:** vision refinement & Gantt chart

- **Make a Gantt chart with activities planned for each step in 2nd phase**

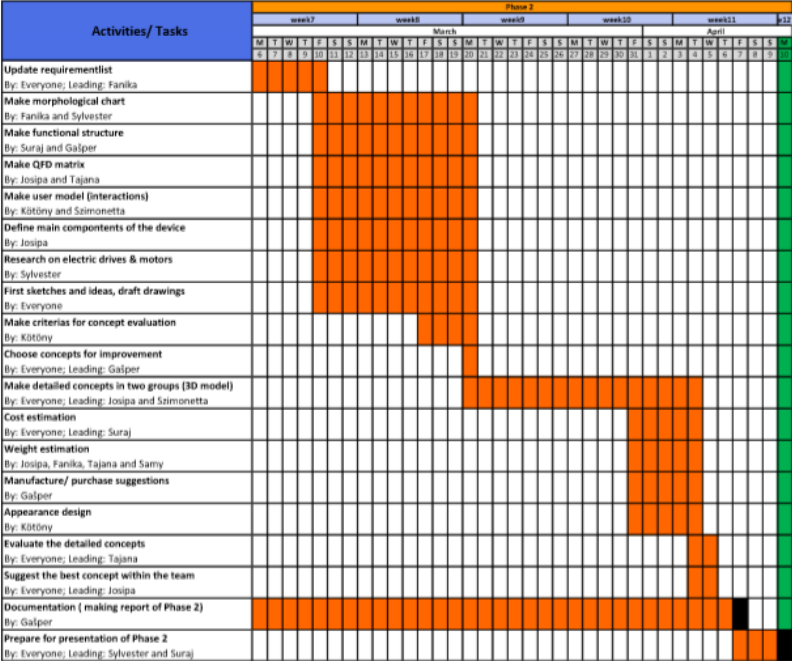
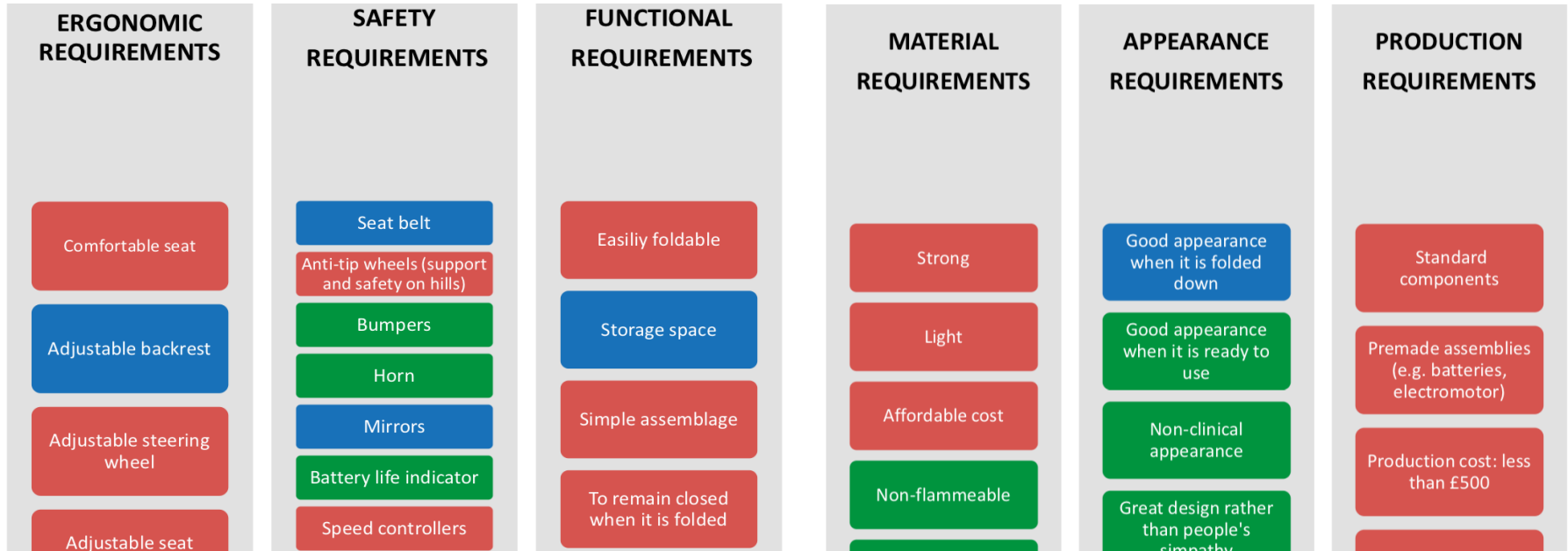


Figure 3. Gantt chart for the second project phase

## 2

**REQUIREMENTS:** PREPARE YOUR LIST OF REQUIREMENTS

# Functional analysis

- Developing functions from requirements to the level that you can offer various technical solutions to them

Tools: black box, glass box, functional decomposition, function-means tree, functional structure diagram, QFD...

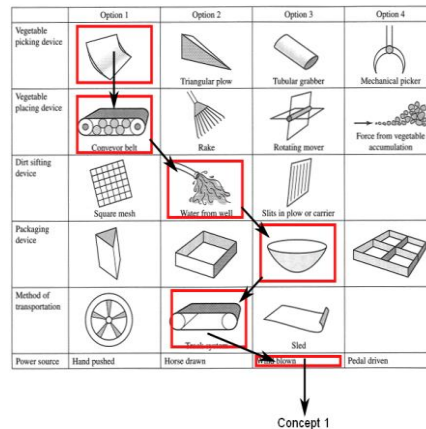


## 3 Inspiration: conceptual tools

- Prof.Cascini's lecture
- Cloud Tools on OwnCloud
- Book: Ullman D.: A Mechanical Design process
- Book: Dym, Little: Engineering design - A project based introduction

## 4 Concepts: Design alternatives

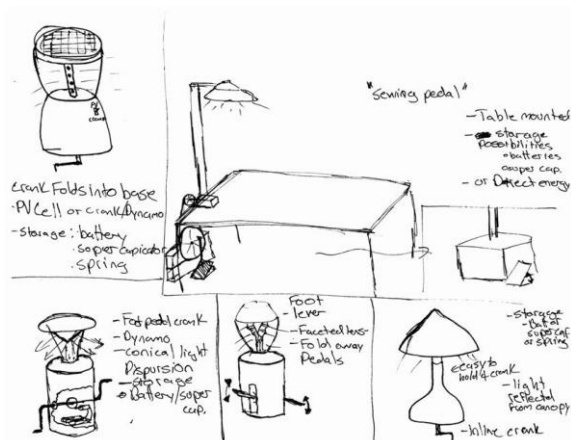
- Make 3 - 4 final concepts (more initial concepts are welcome)
- State which is your preferred one, company representative makes the final choice
- Most common method (not obligatory!): Morphological chart



4

## Product concept representation:

- Sketches
- images
- 3D models
- Infographic
- storyboards
- ....



# 10 rules of good design

Design should:

1. be innovative,
2. make a product useful,
3. be aesthetic,
4. make a product understandable,
5. be unobtrusive,
6. be honest,
7. be long-lasting,
8. be thorough down to the last detail,
9. be environmentally friendly and
10. involve as little design as possible

<https://www.wired.co.uk/article/the-future-of-design>

## 4 Concept evaluation

		Concepts									
		A		B		C		D		E	
		Carbon Fiber		Polycarbonate		Polyetherimide		Polyethylene		Polyphenylene Oxide	
Selection Criteria	Weight	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score
Impact Strength	90%	5	4.5	8	7.2	1	0.9	9	8.1	3	2.7
Hardness	70%	7	4.9	8	5.6	9	6.3	6	4.2	8	5.6
Operating Temp	85%	7	5.95	6	5.1	9	7.65	5	4.25	6	5.1
Price	60%	3	1.8	6	3.6	5	3	9	5.4	8	4.8
Tensile Strength	50%	9	4.5	6	3	7	3.5	5	2.5	6	3
Weather Resistant	90%	8	7.2	8	7.2	8	7.2	8	7.2	5	4.5
			0		0		0		0		0
			0		0		0		0		0
			0		0		0		0		0
			0		0		0		0		0
Total Score		28.85		31.70		28.55		31.65		25.70	
Rank		3		1		4		2		5	
Continue?		N		Y		N		N		N	

Concept selection is an iterative process closely related to concept generation and testing. The concept screening and scoring methods help the team refine and improve the concepts, leading to one or more promising concepts upon which further testing and development activities will be focused.