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## Digital Tools

# THE CREATIVE PROCESS IN 11 PHASES

### A case study



# The Creative Process in 11 Phases

## CREDITS

### INTRODUCTION

Peter Rau

### DESIGN PROCESS

Uroš Hohkravt, Luka Jančič

Images: Final assignment: Veronika Rožmanc

Translation: Aleksandra Ardalić

Editing / concept: Damijan Kracina

Graphic design: Saša Vitežnik Jelen

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# THE CREATIVE PROCESS

The CREATIVE PROCESS is a series of phases, in which different groups of stakeholders, collaborators and professionals from various areas work together. It's a long but interesting creative road that weaves all the way from a basic starting idea all the way to a successful product. We have defined and specified several individual phases of the entire process: the goals, activities, working processes, the role of a project team, the client, industry and the market. The design process is illustrated with examples from a final assignment that was created by a final year industrial design student from the Secondary School of Design and Photography in Ljubljana.

## THE DESIGN PROCESS

DESIGN is every conscious change of images or objects that can be found in our living and working space. It can indirectly also refer to the spaces of our artistic expression in order to perfect their use and appearance or to adapt the materials or their construction. DESIGN is a field based on the principle of aesthetics engineering (Greek: αἰσθητικός; aistetikós – of sense perception). It is linked to the materials, manufacturing processes and economics, all of which establish the particular market value of a product. We also have to take into account the role of the objects, their ergonomics, symbolic value and other significant factors that can influence the design process.

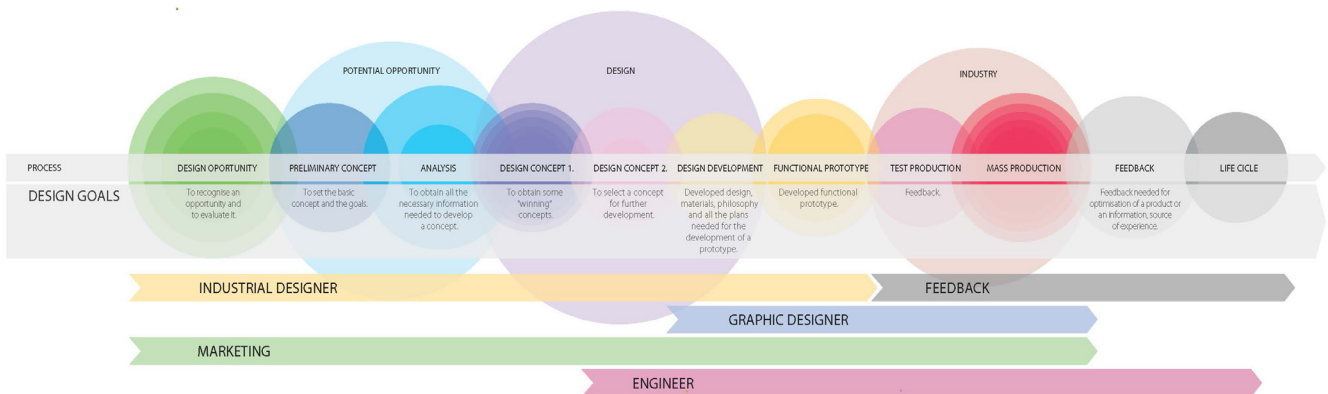
INDUSTRIAL DESIGN is an expression used for a field, in which a range of new or redesigned objects are created based on the principles of industrial production. In practice it can also be called product design. Both expressions refer to a process where a person/people are at the heart of our intention and attention and not the object or the production process. A person is who recognizes the need for the design and carries it out: it's also the client, the designer and marketing professionals.

DESIGN DEVELOPMENT: the path a product takes from its producer to the final user

When an object or a product is manufactured it has to be presented to the wider audience. This involves necessary preparation for transporting products to sellers or the end user. A protective packaging needs to be designed as well as a visual identity that allows the product to be recognized when placed on a shelf amongst other products. This process includes professionals from other fields, such as manufacturers, marketing experts or graphic designers.

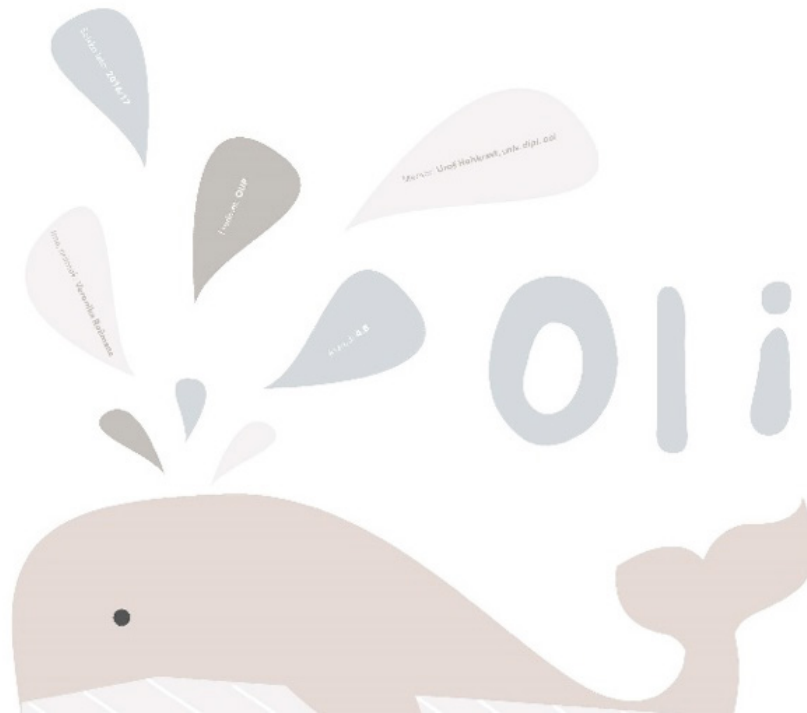
## FINAL THOUGHTS

Industrial design is a creative process that begins with clearly set goals. The research that is carried out to establish these aims has a significant influence on the creative processes. The path to a certain product can be through a completely new and original design or it can redesign an already existing product. Industrial design is not based only on the rules of aesthetics but also includes other aspects, such as the use or purpose of a product, construction, technologies, and the environmental aspect of the product. The characteristics of a successful product are certainly a high-quality design, environmental sustainability and successful marketing. In other words the final product meets all the goals that were established at the beginning of the process.



Graphic presentation: Uroš Hohkravt

# THE CREATIVE PROCESS IN 11 PHASES



Throughout we will follow the design process steps as taken by Veronika Rožmanc in 2016/17. Veronika was a 4th year student from the department of Industrial Design who dedicated her final assignment to children's furniture with the creation of a multi – functional object. Her mentor was Uroš Hohkravt

- PHASE 1: DESIGN OPORTUNITY
- PHASE 2: PRELIMINARY CONCEPT
- PHASE 3: ANALYSIS
- PHASE 4: DESIGN CONCEPT 1
- PHASE 5: DESIGN CONCEPT 2
- PHASE 6: DESIGN DEVELOPMENT
- PHASE 7: FUNCTIONAL PROTOTYPES
- PHASE 8: TEST PRODUCTION INDUSTRY
- PHASE 9: MASS PRODUCTION (INDUSTRY)
- PHASE 10: FEEDBACK
- PHASE 11: LIFE CYCLE



# PHASE 1: DESIGN OPORTUNITY

## ACTIVITY

- Inspiration
- Ideas
- New technology
- Testing
- Market demand

## DESIGN GOALS

To recognize an opportunity and evaluate it.

## RESULT OF THE DESIGN STAGE

Evidence of the need for the product

PARTICIPANTS:

Industrial designers, marketing specialists...

## PROJECT TEAM

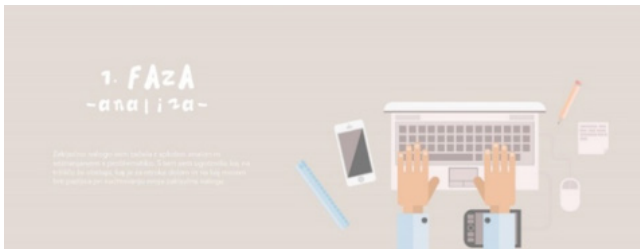
- Industrial designers,
- Engineers, technologists,
- Marketing,
- Experts in the field,
- General public...

## CLIENT

- Client,
- Internal marketing,
- Experts, / developers,
- Users,
- Sales...

## MATERIALS / TECHNOLOGY needed

- Notes,
- Sketchbook,
- Ideas on paper.



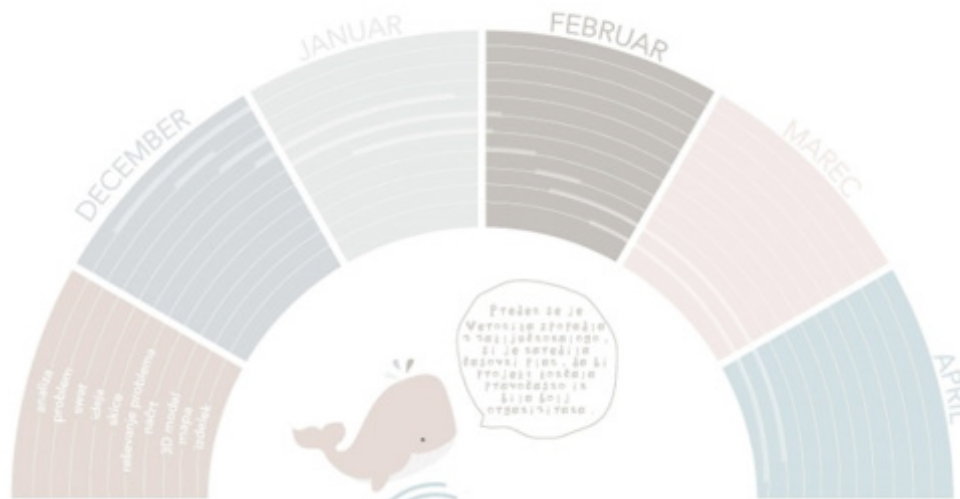
## PHASE 1

Market analysis, searching for the idea for a product, design concept.

Research into existing products on the market, the safety issues and other necessary requirements

In order to finish her assignment on time and to be more organized, Veronika, the student made a time plan.

Time plan: analysis / problem / SWOT / idea / sketches / problem solving / blue print / 3D model / portfolio / product



# PHASE 2: PRELIMINARY CONCEPT

## PRELIMINARY CONCEPT: POTENTIAL OPPORTUNITY

### ACTIVITY

- Market analysis
- Gathering of materials
- Brainstorming
- SWOT analysis
- Philosophy of a concept

### DESIGN GOALS

To set the basic concept and the goals

### RESULT OF THE DESIGN STAGE

Evidence of the need for the product

### PARTICIPANTS:

Industrial designers, marketing specialists...

### PROJECT TEAM

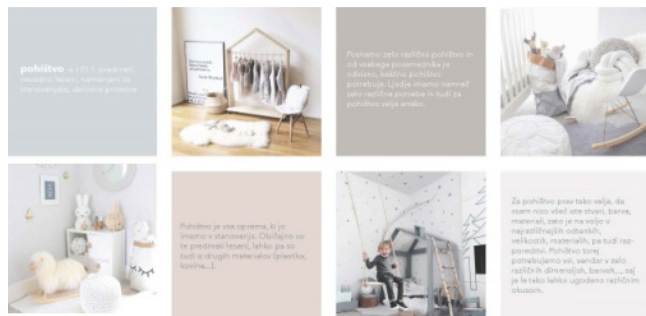
- Designers
- Field experts,
- Ethnologist,
- Psychologist...

### CLIENT

- Representative of the client

### MATERIALS / TECHNOLOGY needed

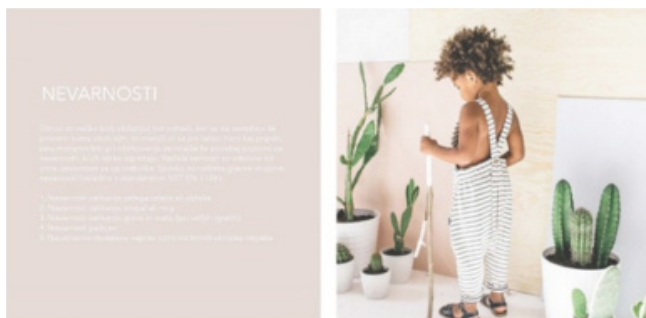
- Notes,
- Sketchbook,
- Digital notes and presentations.



Veronika's starting idea is a multi – functional piece of children's furniture

The student researched and analysed various similar products. She focused on different types of children's furniture and toys and their purpose and use.

She researched the materials, safety requirements, safety standards, colours and their psychological effect on children and the possibilities of technical realization



## PHASE 3: ANALYSIS

### POTENTIAL OPPORTUNITY

#### ACTIVITY

- Evaluation of ideas and selection of the most promising ones
- Analysis of the competing products and market
- Production feasibility, necessary technology and estimated financial plan

#### DESIGN GOALS

To obtain all the necessary information needed to develop a concept

#### RESULT OF THE DESIGN STAGE

Guidelines for development of a concept. Why there are the opportunities and what are the limitations (user, materials, technology, dimensions...)

#### PARTICIPANTS:

Industrial designers, marketing specialists...

#### PROJECT TEAM

- Designers,
- Field experts

#### CLIENT

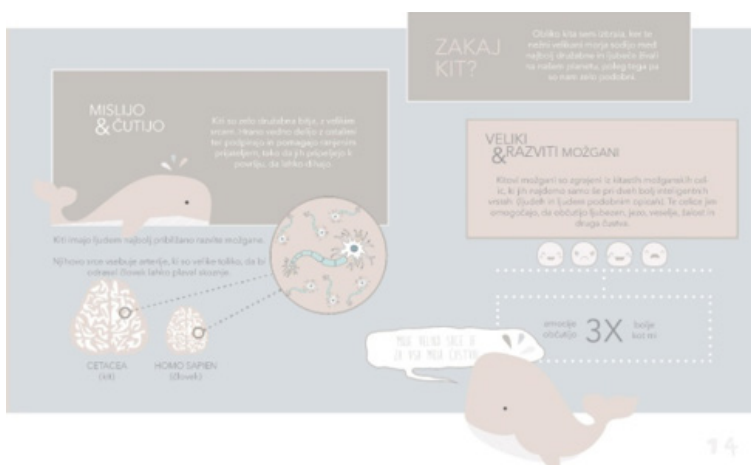
- Representative of the client

#### MATERIALS / TECHNOLOGY needed

- Notes,
- Sketchbook,
- Client's database,
- General database,
- Analyses...

Veronika set 5 GOALS for her final assignment. That...

- Children improve their sense of space through play that encourages their natural development.
- Children can reshape an object into a space through their own practical work ("children's world"), furthering their cognitive development.
- Create a shelter, a space where they can let their creativity and imagination run loose and feel safe. By drawing and writing on furniture children develop their imagination ("rule breaking") which as a consequence relaxes them and makes them happy. Drawing and writing symbolise concentration and meditation but also have a calming effect and raise self-consciousness.
- A lasting piece of furniture that can be redesigned in order to change its function.



Why the whale?

A BIG HEART FOR ALL OF MY FEELINGS!

"I chose the shape of a whale because these gentle giants of the seas are one of the most loving and sociable animals on our planet, they are also quite similar to us humans. Whales are very sociable creatures with a big heart. They always share their food with the others and support the wounded members of their pod in a way that they help them swim to the surface in order to breathe."



## PHASE 4: DESIGN CONCEPT 1

### ACTIVITY

- Sketches
- Scale models
- Brainstorming (quantity)

### DESIGN GOALS

To obtain some “winning” concepts.

### RESULT OF THE DESIGN STAGE

- Larger quantity of sketches,
- Selection of 2-3 ideas to be developed further.

### PARTICIPANTS:

Industrial designers, marketing specialists...

### PROJECT TEAM

- Designers (team)

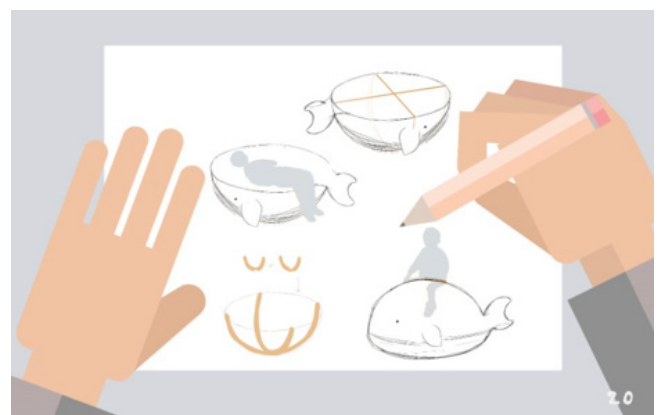
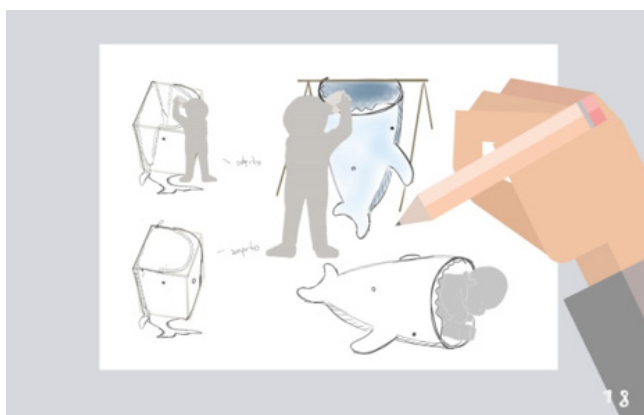
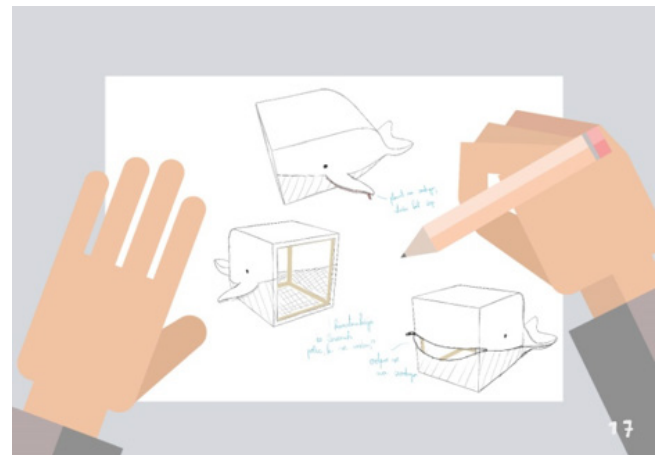
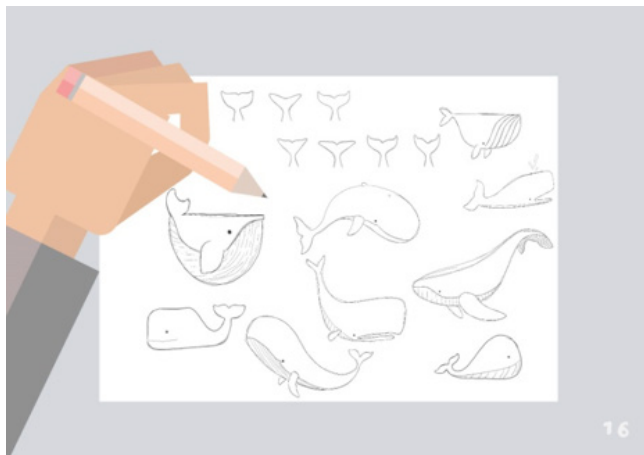
### MATERIALS / TECHNOLOGY needed

- Notes,
- Sketches,
- Scale models,
- 3D models.



### SKETCHING

Veronika tried to find possible solutions through a series of sketches, where she explored the possibilities. After this preliminary process she focused on a single idea and developed it in more detail.





## PHASE 5: DESIGN CONCEPT 2

### ACTIVITY

- Plans
- Ergonomics
- 3D models
- Visualisations
- Physical models (3D Prints, CNC...)

### DESIGN GOALS

To select a concept for further development.

### RESULT OF THE DESIGN STAGE

3D model or a physical model with all the details specified  
Ready up to the stage where the implementation of technological solutions can start

### PARTICIPANTS:

Industrial designers, marketing specialists, engineer

### PROJECT TEAM

- Designers,
- Developers,
- Field experts (CAD, CAM)

### MATERIALS / TECHNOLOGY needed

- Traditional approach
- CAD/CAM (CNC, 3D prints, laser cutting...)

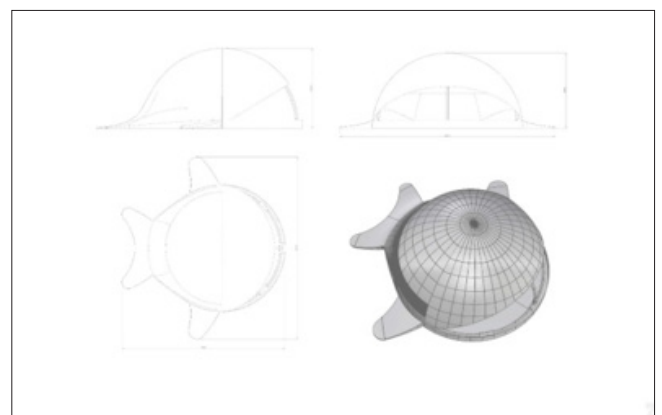
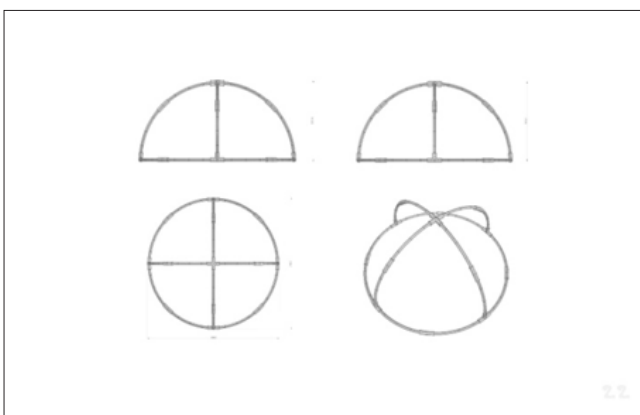
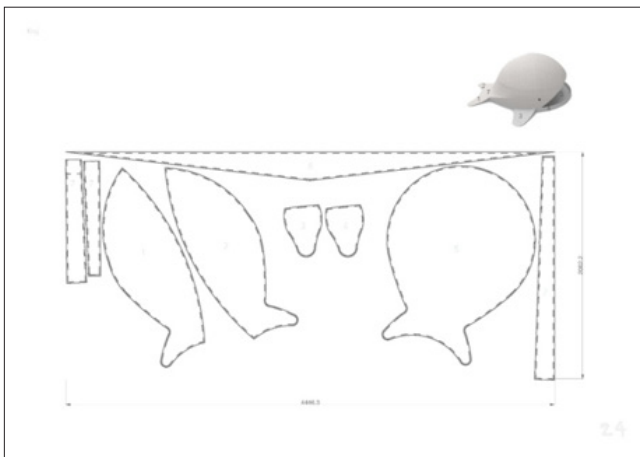


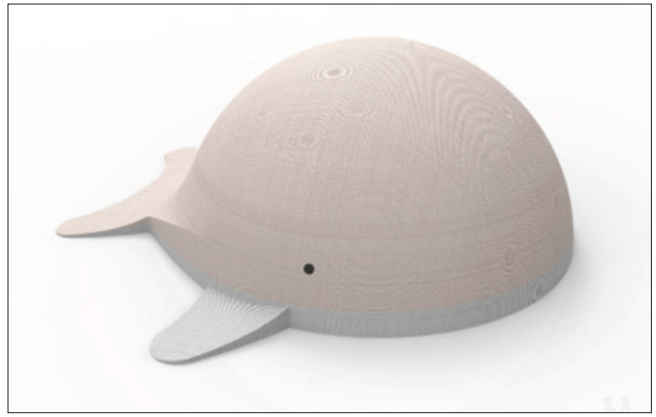
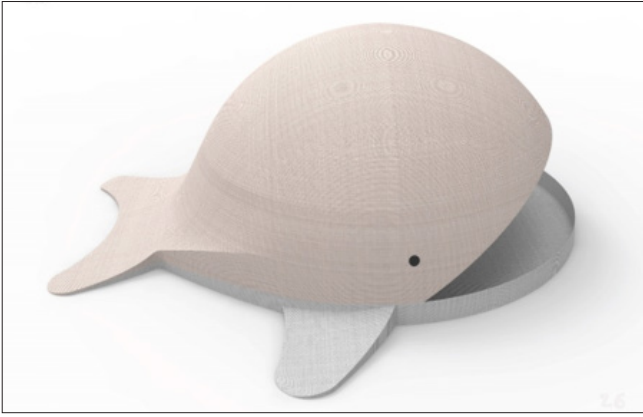
### VISUALISATION

In order to visualize the product more easily Veronika made the blue prints and a pattern. Her idea was presented first through computer 3D render models, later she created test models and in the end the final product was created.

### CONSTRUCTION

Test models, Pattern, - Construction of the final product





The images show downscaled model of a tent. The scale is 1:5, but the functionality and the materials are identical to the end product.

## PHASE 6: DESIGN DEVELOPMENT

### ACTIVITY

- Detailing of the details and principles
- Simulation on 3D models (thickness, principles, pieces...)
- Beginning of the marketing process, visualisation and the first feedback.

### DESIGN GOALS

Develop design, materials, philosophy and all the plans needed for the development of a prototype.

### RESULT OF THE DESIGN STAGE

- Blue prints of solutions for the details and product as a whole.
- CAD 3D model.

### PARTICIPANTS:

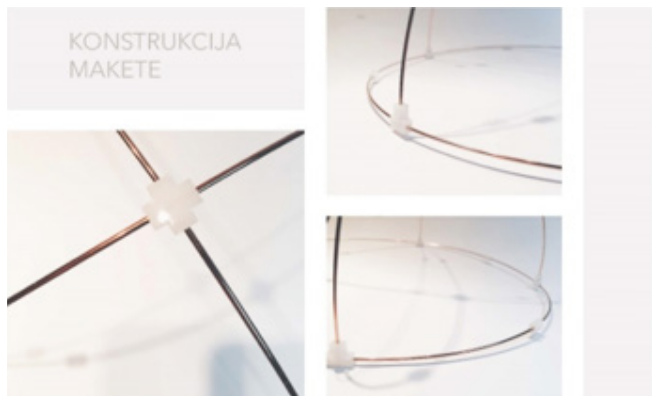
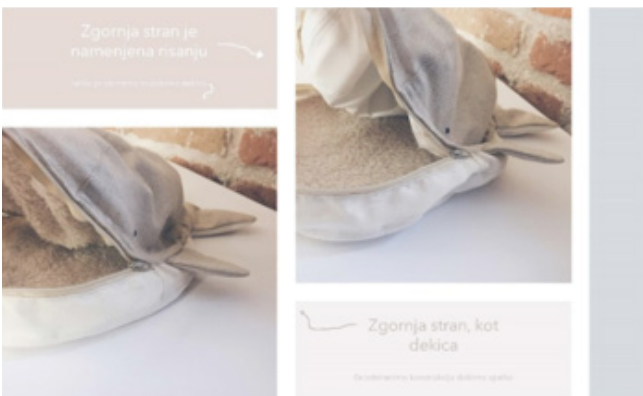
Industrial designers, graphic designers, marketing specialists, engineer

### PROJECT TEAM

- Designers,
- Technologists,
- Developers.

### MATERIALS / TECHNOLOGY needed

Technology needed for the execution



## PHASE 7: FUNCTIONAL PROTOTYPES

### ACTIVITY

- Planning and defining of the manufacturing processes?
- Testing of the materials and functioning of the product itself.

### DESIGN GOALS

Developed functional prototype

### RESULT OF THE DESIGN STAGE

- Final blue prints of the product design
- CAM 3D model

### PARTICIPANTS:

Industrial designers, graphic designers, marketing specialists, engineer

### PROJECT TEAM

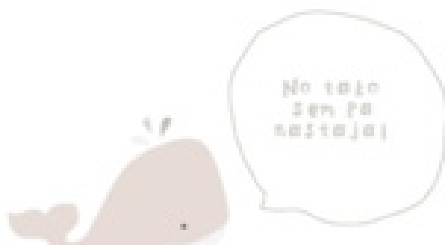
- Designers,
- Technologists,
- Developers.

### MATERIALS / TECHNOLOGY needed

Technology needed for the execution (CNC, laser...)



Ki je odveš belu s pomočjo škarj. Le ta mi je posvetila večino časa in (ubran), ker ga izdelala zelo prefinjeno in natančno. Videlna mi je duša in srce. Zame sem ji hvaležna, da je svoje moje zaključno nalogo tot izlo, a vselejmi sprejela namčila in ga izdelala po svojih najboljših močeh. Brez nje bi moja ideja ostala samo na papirju.



## PHASE 8: TEST PRODUCTION INDUSTRY

### ACTIVITY

- Planning and defining of the manufacturing processes?
- Testing of the materials and functioning of the product itself.

### DESIGN GOALS

Feedback

### RESULT OF THE DESIGN STAGE

- Production blue prints with tallies
- CAM 3D models for individual production stages
  - Serial product

### PARTICIPANTS:

Industrial designers, graphic designers, marketing specialists, engineer, feedback

### PROJECT TEAM

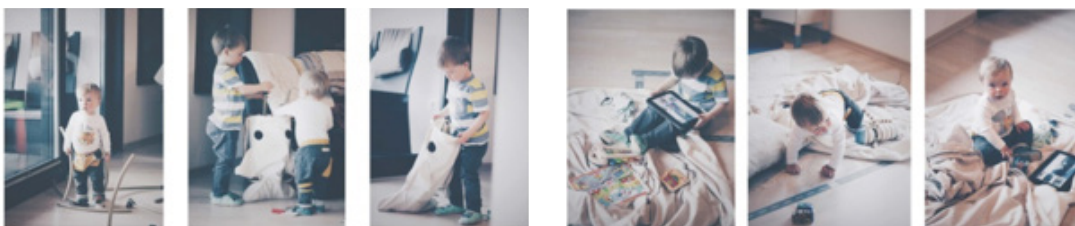
- Designers,
- Marketing experts,
- Engineers.

### CLIENT

- Representative of the client
- Marketing experts
- Developers.

### MATERIALS / TECHNOLOGY needed

Industrial processes of serial production



## PHASE 9: MASS PRODUCTION (INDUSTRY)

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### PARTICIPANTS:

Industrial designers, graphic designers, marketing specialists, engineer, feedback

## PHASE 10: FEEDBACK

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### DESIGN GOALS

Feedback needed for optimisation of a product or information, source of experience feedback

## PHASE 11: LIFE CYCLE

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### CREDITS

#### INTRODUCTION

Peter Rau

#### DESIGN PROCESS

Uroš Hohkravt, Luka Jančič

Images: Final assignment: Veronika Rožmanc

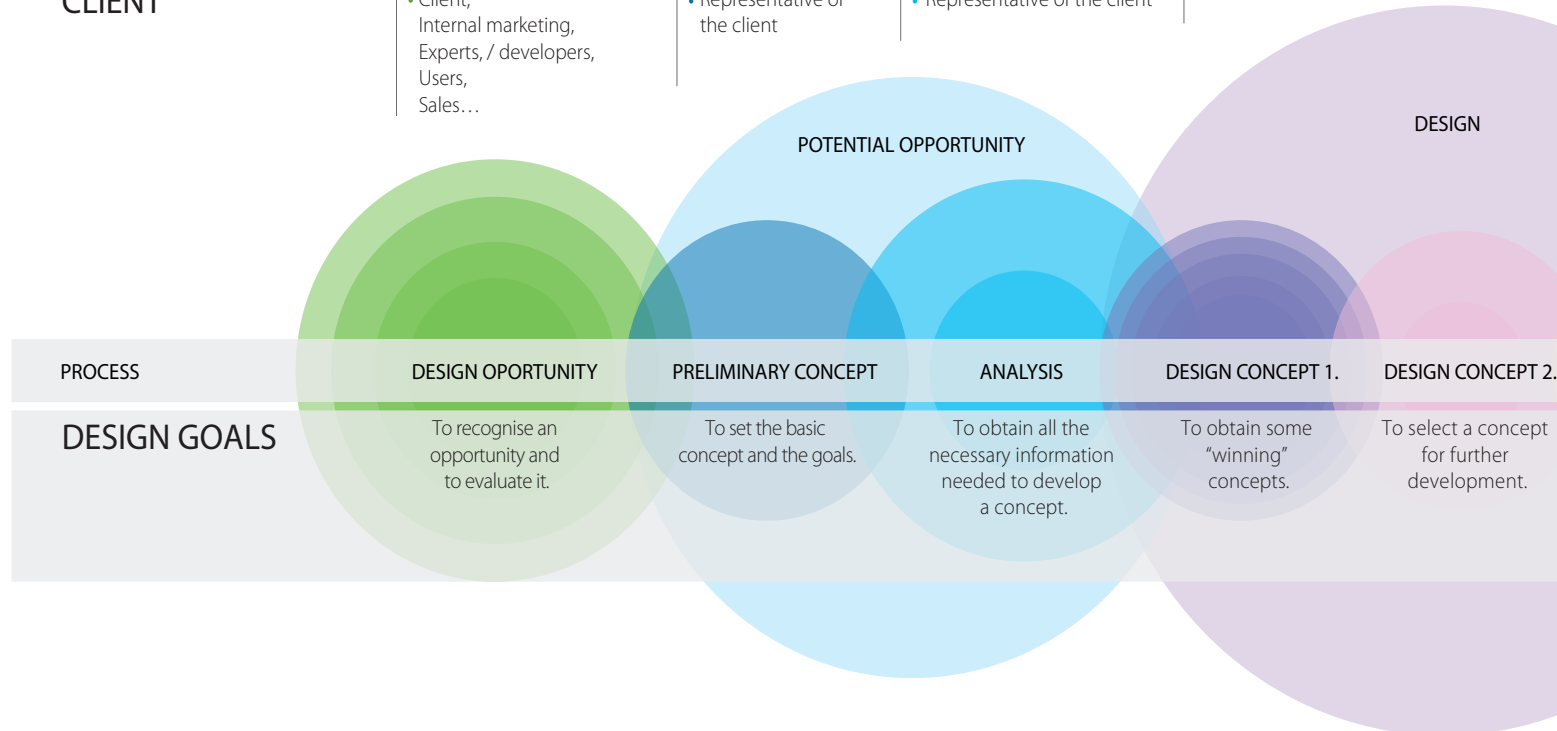
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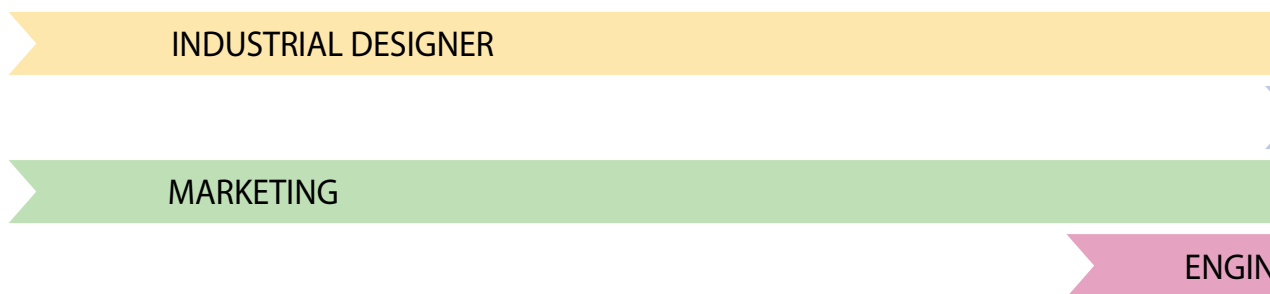


# DESIGN PROCESS

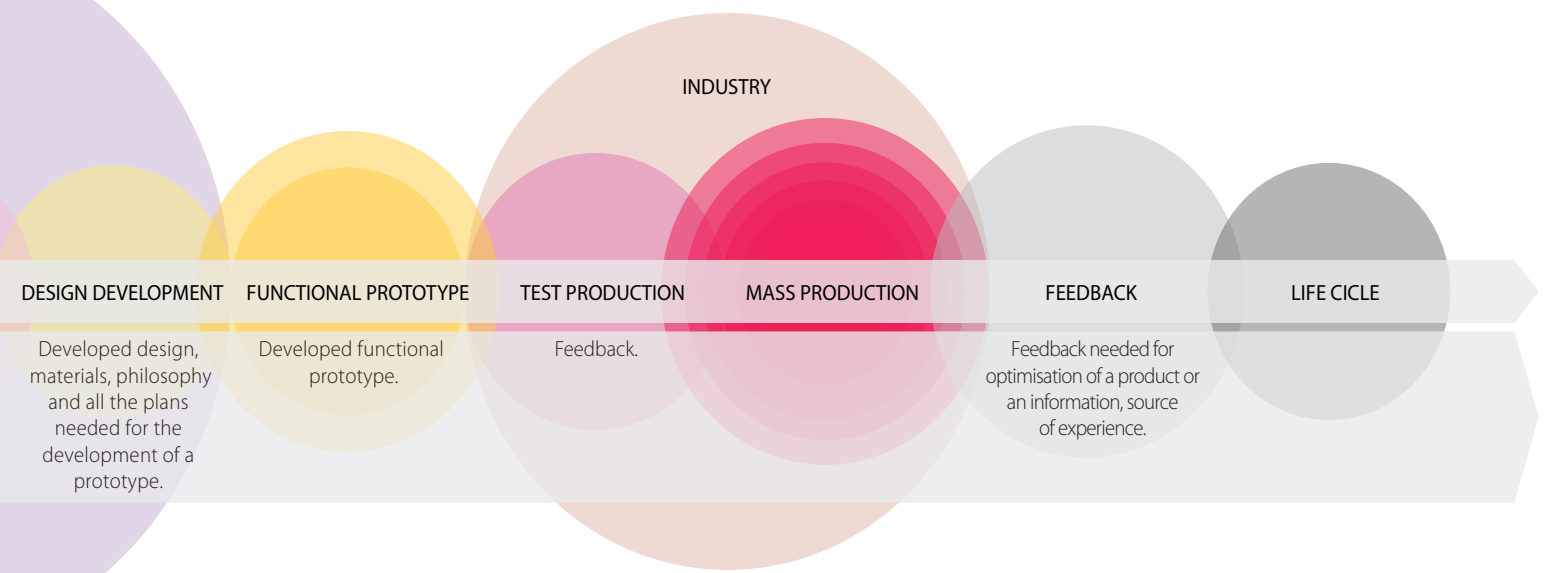
<b>ACTIVITY</b>	<ul style="list-style-type: none"> <li>• Inspiration</li> <li>• Ideas</li> <li>• New technology</li> <li>• Testing</li> <li>• Market demand</li> </ul>	<ul style="list-style-type: none"> <li>• Market analysis</li> <li>• Gathering of materials</li> <li>• Brainstorming</li> <li>• SWOT analysis</li> <li>• Philosophy of a concept</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluation of ideas and selection of the most promising ones</li> <li>• Analysis of the competing products and market</li> <li>• Possibility of realisation, necessary technology and estimated financial plan</li> </ul>	<ul style="list-style-type: none"> <li>• Sketches</li> <li>• Scale models</li> <li>• Brainstorming (quantity)</li> </ul>	<ul style="list-style-type: none"> <li>• Plans</li> <li>• Ergonomics</li> <li>• 3D models</li> <li>• Visualisations</li> <li>• Physical models (3D Prints, CNC...)</li> </ul>
<b>PROJECT TEAM</b>	<ul style="list-style-type: none"> <li>• Industrial designers,</li> <li>• Engineers, technologists,</li> <li>• Marketing,</li> <li>• Experts in the field,</li> <li>• General public...</li> </ul>	<ul style="list-style-type: none"> <li>• Designers,</li> <li>• Field experts,</li> <li>• Ethnologist,</li> <li>• Psychologist...</li> </ul>	<ul style="list-style-type: none"> <li>• Designers,</li> <li>• Field experts</li> </ul>	<ul style="list-style-type: none"> <li>• Designers (team)</li> </ul>	<ul style="list-style-type: none"> <li>• Designers,</li> <li>• Developers,</li> <li>• Field experts (CAD, CAM)</li> </ul>
<b>CLIENT</b>	<ul style="list-style-type: none"> <li>• Client,</li> <li>• Internal marketing,</li> <li>• Experts, / developers,</li> <li>• Users,</li> <li>• Sales...</li> </ul>	<ul style="list-style-type: none"> <li>• Representative of the client</li> </ul>	<ul style="list-style-type: none"> <li>• Representative of the client</li> </ul>		



<b>TECHNOLOGY</b>	<ul style="list-style-type: none"> <li>• Notes,</li> <li>• Sketchbook,</li> <li>• Ideas on paper.</li> </ul>	<ul style="list-style-type: none"> <li>• Notes,</li> <li>• Sketchbook,</li> <li>• Digital notes and presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Notes,</li> <li>• Sketchbook,</li> <li>• Client's database,</li> <li>• General database,</li> <li>• Analyses...</li> </ul>	<ul style="list-style-type: none"> <li>• Notes,</li> <li>• Sketches,</li> <li>• Scale models,</li> <li>• 3D models.</li> </ul>	<ul style="list-style-type: none"> <li>• Traditional approach</li> <li>• CAD/CAM (CNC, 3D prints, laser cutting)</li> </ul>
<b>RESULT OF THE DESIGN STAGE</b>		<ul style="list-style-type: none"> <li>• Evidence of the need for the product</li> </ul>	<ul style="list-style-type: none"> <li>• Guidelines for development of a concept. Why there are the opportunities and what are the limitations (user, materials, technology, dimensions...)</li> </ul>	<ul style="list-style-type: none"> <li>• Larger quantity of sketches,</li> <li>• Selection of 2-3 ideas to be developed further.</li> </ul>	<ul style="list-style-type: none"> <li>• 3D model or a physical model with all the details specified</li> <li>• Ready up to the stage where the implementation of technological solutions can start.</li> </ul>



<ul style="list-style-type: none"> <li>• Detailing of the details and principles</li> <li>• Simulation on 3D models (thickness, principles, pieces...)</li> <li>• Beginning of the marketing process, visualisation and the first feedback.</li> </ul>	<ul style="list-style-type: none"> <li>• Planning and defining of the manufacturing processes,</li> <li>• Testing of the materials and functioning of the product itself.</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback on product execution,</li> <li>• Elimination of the problems and optimization of the manufacturing process.</li> </ul>
<ul style="list-style-type: none"> <li>• Designers,</li> <li>• Technologists,</li> <li>• Developers.</li> </ul>	<ul style="list-style-type: none"> <li>• Designers,</li> <li>• Technologists,</li> <li>• Developers.</li> </ul>	<ul style="list-style-type: none"> <li>• Designers,</li> <li>• Marketing experts,</li> <li>• Engineers.</li> </ul>
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<ul style="list-style-type: none"> <li>• Technology needed for the execution</li> </ul>	<ul style="list-style-type: none"> <li>• Technology needed for the execution (CNC, Laser ...).</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial processes of serial production</li> </ul>
<ul style="list-style-type: none"> <li>• Blue prints of solutions for the details and product as a whole.</li> <li>• CAD 3D model.</li> </ul>	<ul style="list-style-type: none"> <li>• Final blue prints of the product design</li> <li>• CAM 3D model</li> </ul>	<ul style="list-style-type: none"> <li>• Production blue prints with tallies,</li> <li>• CAM 3D models for individual production stages</li> <li>• Serial product.</li> </ul>

