

# Agile'TRIZ Framework: towards the integration of TRIZ within the Agile Innovation Methodology

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## Summary

- › Context
  - *General context*
  - *Agile Product Development Process*
  - *TRIZ*
- › Problem: Agile VS TRIZ
- › Agile'TRIZ Framework
  - *Objectives*
  - *Concept of Agile'TRIZ*
- › Discussions and Future works

## Context

### *General context*

- › Customer
  - Has highly specific but also rapidly changing needs;
  - wants high-quality and low-cost products.
- › R&D engineers should
  - integrate more technical innovations
  - reduce their development time and costs.
- › Current product design strategies tend to be
  - more flexible,
  - adaptive
  - “agile” → Agile Development Strategy

## Context

### *Agile product development process*

#### › Agility

- Capability to react, and adopt to expected and unexpected changes within a dynamic environment constantly and quickly;
- to use those changes as an advantage

› An agile framework comprises agile **values** and **principles** as well as **methods**,

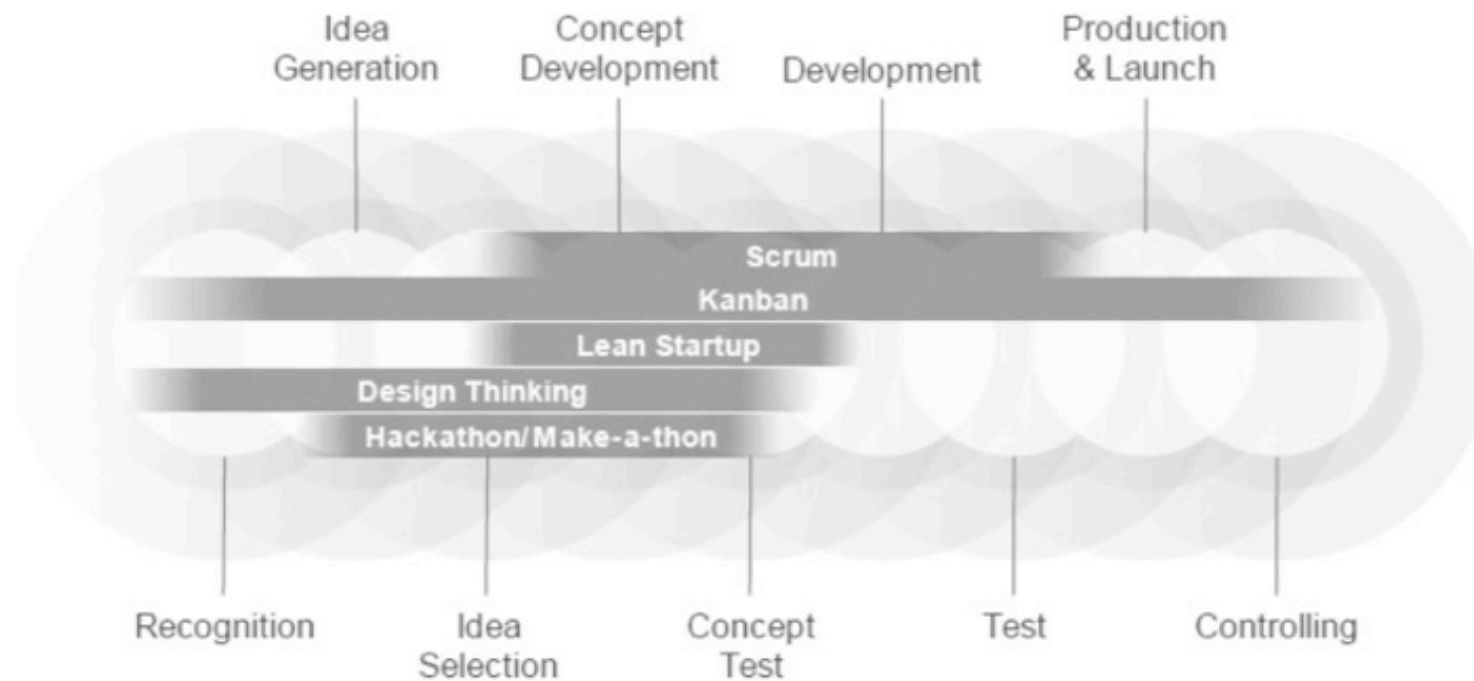
› Commonly coupled through a **process**

# Context

## › Agile design strategies

- first developed as software development strategies in 2001
- It is widely used in the industry as the main product development process

## › Agile frameworks within the generic innovation process



## Context *TRIZ*

- Design teams should spend a huge amount of time for analyzing the initial situation and draw the problem graph
  - They then should decide on which problems they will focus their innovation problem-solving activities
- 
- ➔ **Design team spends more time in analyzing its problem than to develop new ideas and concepts but finally skip most of the identified problems or tasks**
  - ➔ **TRIZ only provides concepts but no implementable solutions.**
  - ➔ **TRIZ does not guarantee a feasible solution**

# Problem

## *Agile VS TRIZ*

### › Agile Models

- Provide a product development process
- Passe several process phases at the same time
- Can rapidly lead to feasible solutions
- But do not provide development tools

### › TRIZ

- Time-consuming approach
- Focus on one problem a time
- Does not guarantee a feasible solution
- But provide many tools

**Agile'TRIZ  
Framework**  
Integration of  
TRIZ in an Agile-  
based framework

# Agile'TRIZ Framework



- › Could the design team spend less time in analyzing the problem and more time on creativity tasks?
- › How could we speed up the creativity tasks to quickly develop implementable innovative products?
- › How could we improve the interaction of the design teams during the innovation development and eventually rapidly correct the interaction problems as soon as possible?



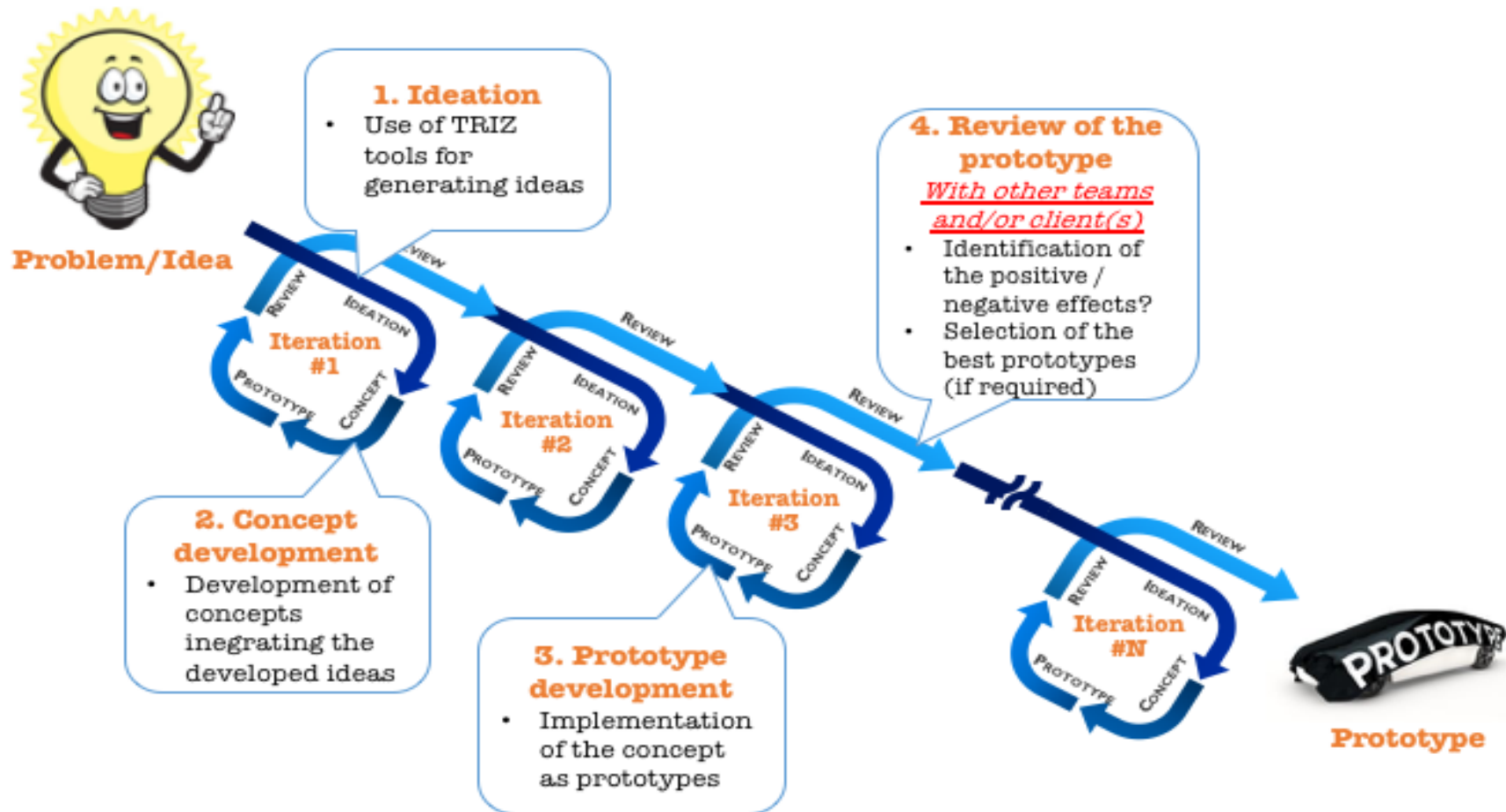
# Agile'TRIZ Framework

## *Objectives*

- › TRIZ-based agile framework would provide an iterative and incremental development strategy that should allow the designers to:
  - **Spend less time for analyzing the initial situation**, as the designers may start the development with a minimal problem, which will be complemented in the next iterations,
  - **Use some TRIZ tools**, to provide a limited number of ideas for solving its problem,
  - **Rapidly go through the development of a first prototype**,
  - **Learn the positive and negative effects** from the evaluation and the review of the prototype,
  - **Improve the prototype** during the further iterations (#2, #3, ...),
  - **Improve the interactions** between the different design teams and reduce the interaction problems of the final product.

# Agile'TRIZ Framework

- Functional diagram (Concept)



# Agile'TRIZ Framework Concept

## > 1. Ideation

- Designer uses TRIZ tools to generate new ideas and summarizes the idea generation in a morphological matrix

<b>Functions /Problems</b>	<b>TRIZ inventive principle</b>	<b>Ideas</b>		
Problem A	<i>1. Segmentation</i>	Idea A1	Idea A2	...
	<i>3. Local quality</i>	Idea A3	Idea A4	...
...				
Problem Z	<i>23. Feedback</i>	Idea Z1	Idea Z2	...

# Agile'TRIZ Framework Concept

## › 2. Concept development

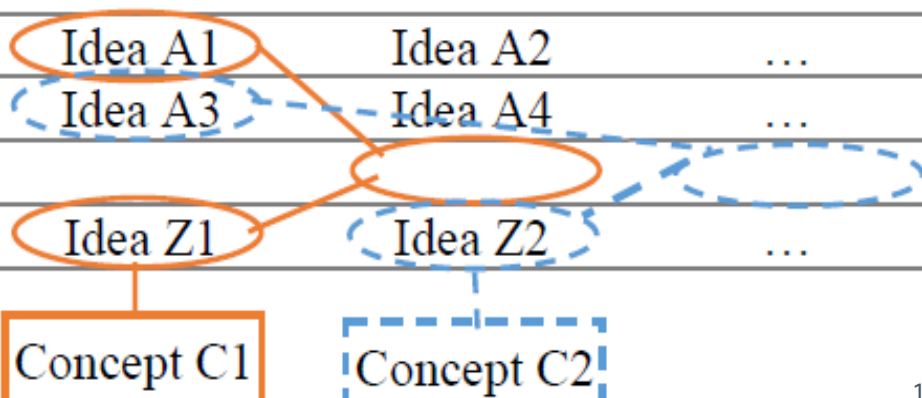
- Design team develops concepts by combining at least one idea from each row.
- These idea can be computerized with the use of combinatorial optimization algorithms

<b>Functions /Problems</b>	<b>TRIZ inventive principle</b>	<b>Ideas</b>	
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	<i>3. Local quality</i>	Idea A3	Idea A4 ...
...			
Problem Z	<i>23. Feedback</i>	Idea Z1	Idea Z2 ...

Concept C1

Concept C2



# Agile'TRIZ Framework

## *Concept*

### › **3. Prototype development**

- Design team develops prototype that implements the concepts developed during the previous step.

### › **4. Review of the prototype**

- Design team, together with the other development teams and the client/user, reviews the developed prototypes and extracts the positive and negative effects of each prototype
- Analysis of the implementation and problems interaction

# Agile'TRIZ Framework Concept



## Discussions and Future works

### *Discussions*

- › Agile'TRIZ allows starting with just a minimum feature set to build a prototype
  - Several iterative steps allow to rapidly improve the prototype
  - by allowing regular user interactions through all the process (ideally after each iteration, during the review step)
  - improves the ability of collaborative work and the possibility of the several design teams to work within a common project and simultaneously develop a portion of the global super-system.
  - The review step indeed allows the teams to discuss and expose their prototypes and identify the interaction and integration issues.
  - These issues can then rapidly be taken into account during the process.

# Discussions and Future works

## *Future works*

- Development of TRIZ-specific tools for Agile'TRIZ
- Improve the integration and compatibility of TRIZ with the Agile innovation strategy
- **Experimentation** first with our students and later with our industrial partners
- **Evaluation** the framework and the ability of the students/partners to rapidly develop viable prototypes as well as working in collaborative design teams
- **Implementation and software development**



Thank you for your  
attention

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