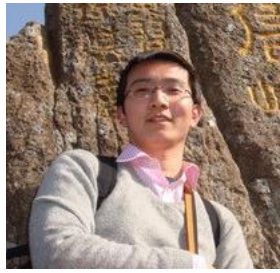


УДК 001.895

THE DEVELOPMENT OF INNOVATIVE PRODUCTS



R. WANG, PhD

Associate Professor, Vice Dean of Department of Communication Engineering, School of Communication and Information Engineering, Shanghai University



S. GOMES, PhD

Professor, Head of Mechanical Engineering and Design department, Université de Technologie de Belfort-Montbéliard

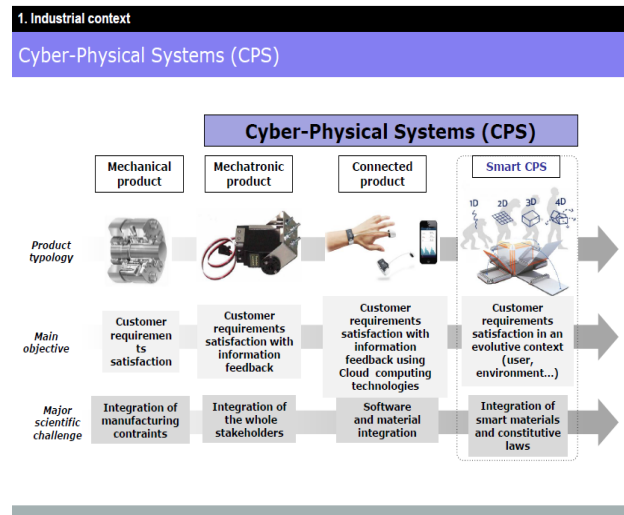
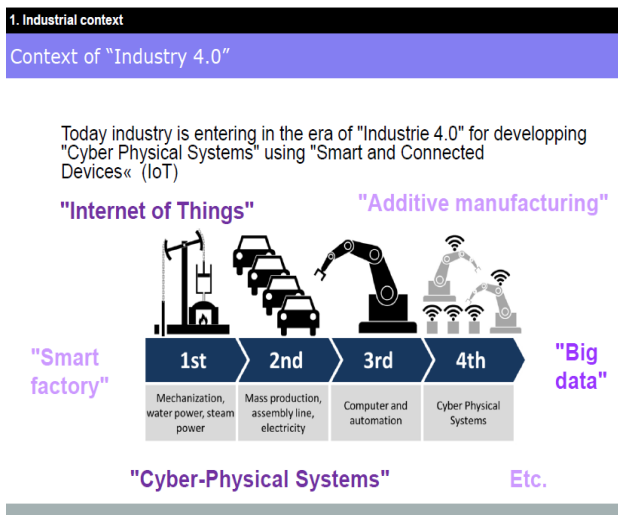
Department of Communication Engineering of School of Communication and Information Engineering, Shanghai, China

Mechanical Engineering and Design department, Université de Technologie, Belfort-Montbéliard, France

E-mail: rwang@shu.edu.cn

Abstract. This paper introduces the idea of lean product development and lean innovation, which aims at developing engineering methods and tools in order to decrease time devoted to routine design and to allocate more resources for innovation. The experiences of teaching formats of “product innovation” in Shanghai University, such as 24h innovation competition, MVP in 36h (how to build your prototype in 36 hours), 10-week innovations are also provided.

Key words: lean innovation, engineering methods, engineering tools.



1. Industrial context
Today new solutions exists...

Lean thinking and design automation (design computing) for **engineering productivity** and **innovation !!!**

2. From invention to innovation
From invention to innovation...

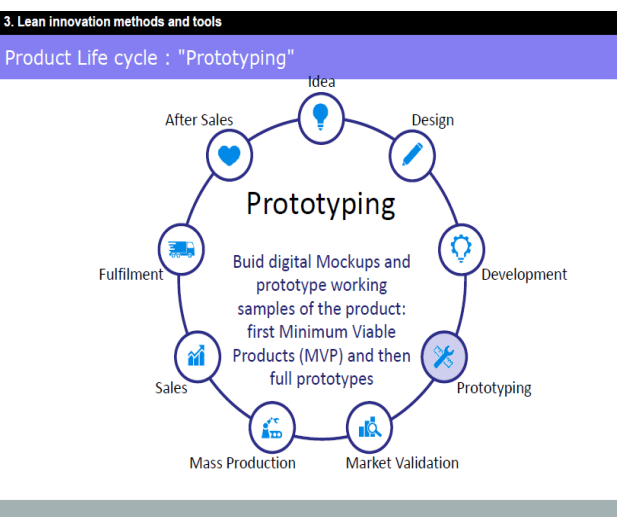
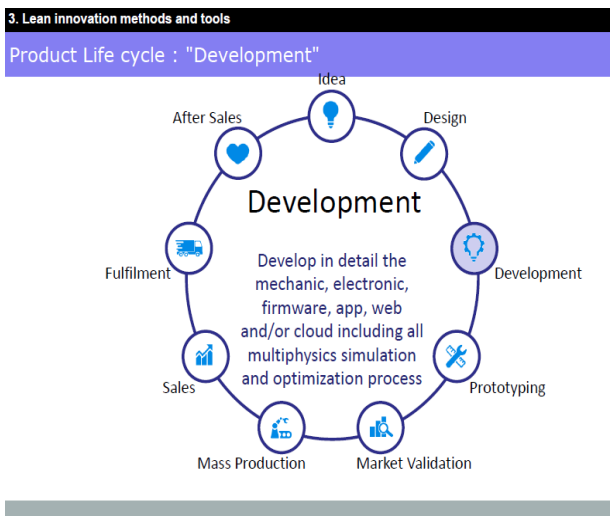
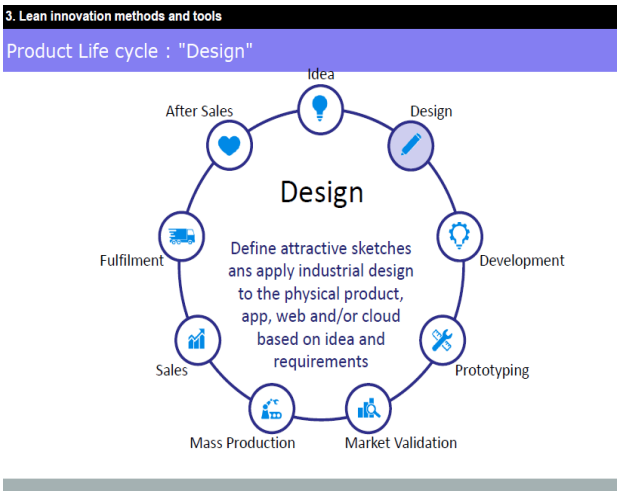
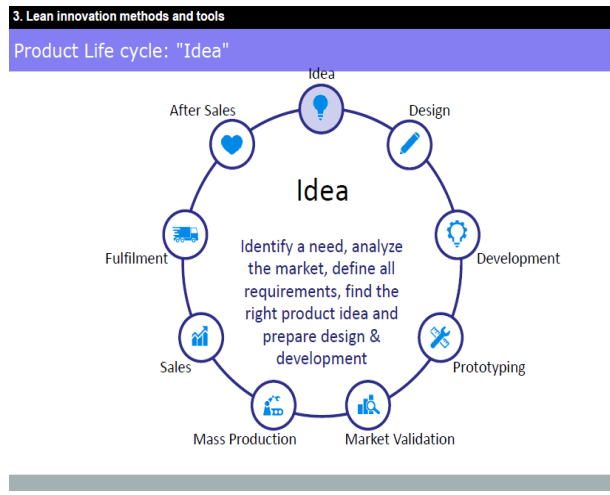
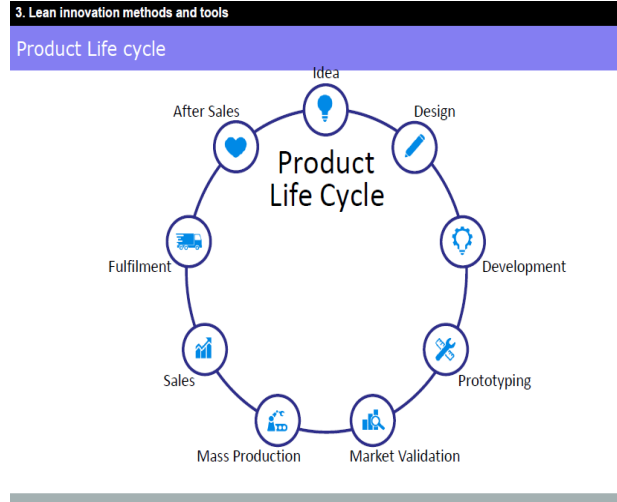
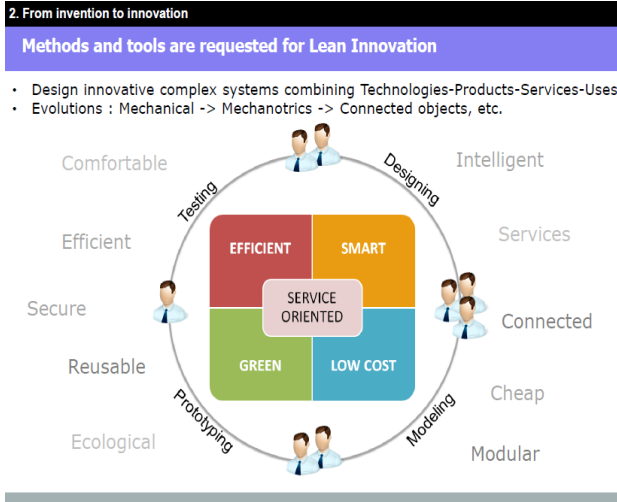
2. From invention to innovation
Example of Human communication...

1. Industrial context
From invention to innovation...

2. From invention to innovation
Lean thinking...

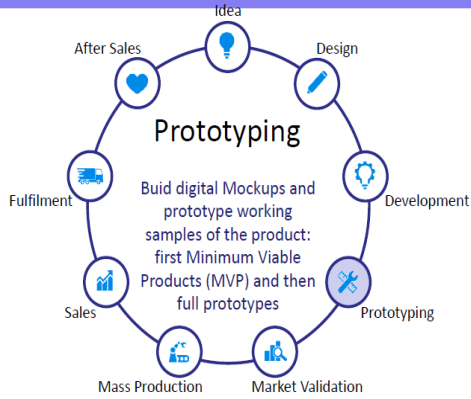
2. From invention to innovation
From new technologies to new uses

Lean Innovation leads to change the identity of objects, in the same time, redefine the technologies, the business models, the uses models of a Product/Service.



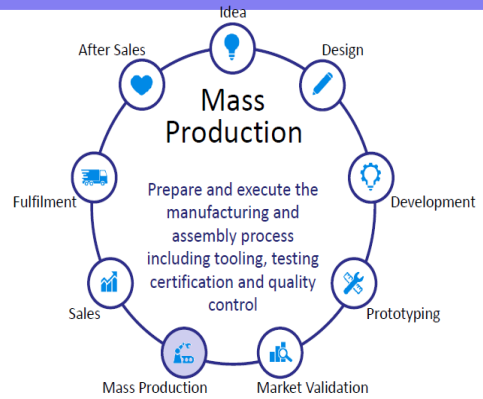
3. Lean innovation methods and tools

Product Life cycle : "Prototyping"



3. Lean innovation methods and tools

Product Life cycle : "Mass Production"



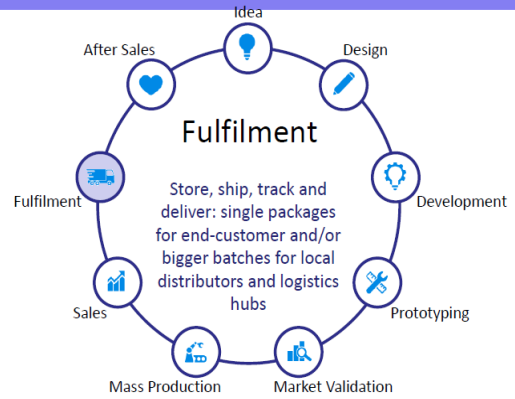
3. Lean innovation methods and tools

Product Life cycle : "Sales"



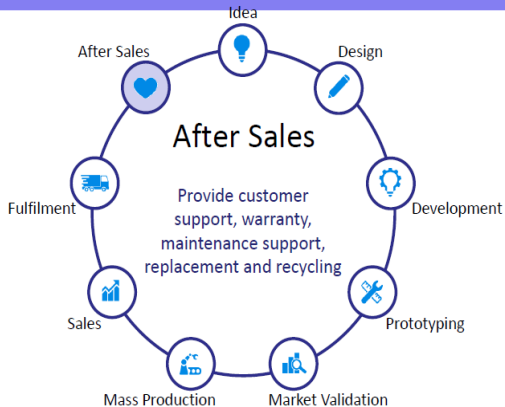
3. Lean innovation methods and tools

Product Life cycle : "Fulfilment"



3. Lean innovation methods and tools

Product Life cycle : "After Sales"



4. Several formats for teaching innovation

Many time formats for teaching innovation

10 weeks innovation

- 80 h
- Standard lectures
- Design / Modeling / Simulation
- Mock-up prototyping

6 days innovation

- 36 h
- Special week UTSEUS-SHU
- Design / Modeling / Simulation
- MVP prototyping

24h innovation

- 24h
- International challenge
- Design / Modeling / Video

4. Several formats for teaching innovation
24h Innovation – Description



> International competition

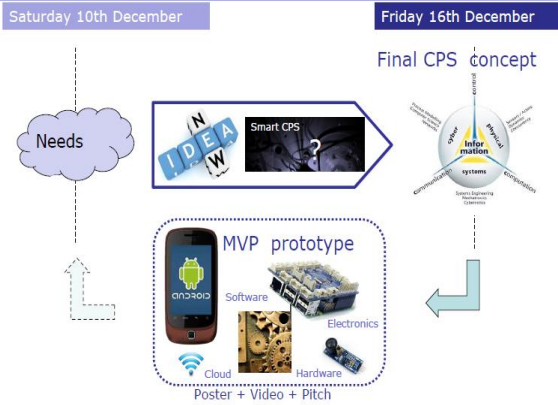
- > Organized by the Ecole de Technologie Supérieure (Montreal Quebec)
- > Set up of team (SHU: 8-10 students)
- > Work on industrial or academic subjects synchronously in several universities at an international level
- > Rendering results (specifications, solution concepts, sketches, CAD models) 24 hours later

4. Several formats for teaching innovation
24h Innovation – Description

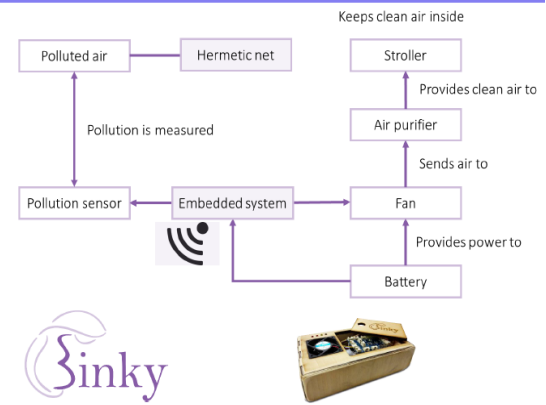


- > Objective: 24h chrono to develop an innovative solution
- > The works are presented (3min / team) before a jury of innovation experts who awards prizes to the best projects.
- > SHU: about 80 students on the campus
- > Educational objective: apply project design and project management methods learned during GMC training to SHU, in accelerated mode

4. Several formats for teaching innovation
6 days innovation



4. Several formats for teaching innovation
Project 1 : Binky



4. Several formats for teaching innovation
Project 2 : AIRCARE



4. Several formats for teaching innovation
Project 3 : TSMB



4. Several formats for teaching innovation

Project 4 : Smart Helmet

MVP SCHEMA

Send information to cloud storage

Send information to smartphone via bluetooth

Potential danger gets close to you

Distance sensors

Vibrators

Tilt the head to the side you want to turn

Accelerometer

LEDs

Vibrators

4. Several formats for teaching innovation

Project 5 : °Cup

°Cup

we GIVE YOU BACK the PLEASURE for HOT DRINKS !

It's a smart bottle for any person who likes hot drinks and using smart and fancy device. It allows you to manage the temperature of your drink as you wish, in order to enhance your hot drink pleasure. It follows your statistics and manages your personal well-being thanks to the user profile and registered data.

Access your smartphone °CUP via your smartphone.

The thermometer the same temperature and degree to be any.

Choose the temperature of your drink. Thanks to the App.

The smart bottle monitors your drink temperature in 30s.

Enjoy your drink !

5. Projects demonstrator operated at SHU SCIE

IOT, VR/AR Projects

Panoramic stitching

Quadcopter

Phantom imaging

VR/AR

Shared umbrella

Smart signpost

VR/AR