

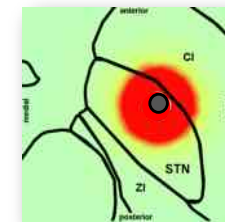
Product Ecology for the Elicitation of Requirements

 ruudcox

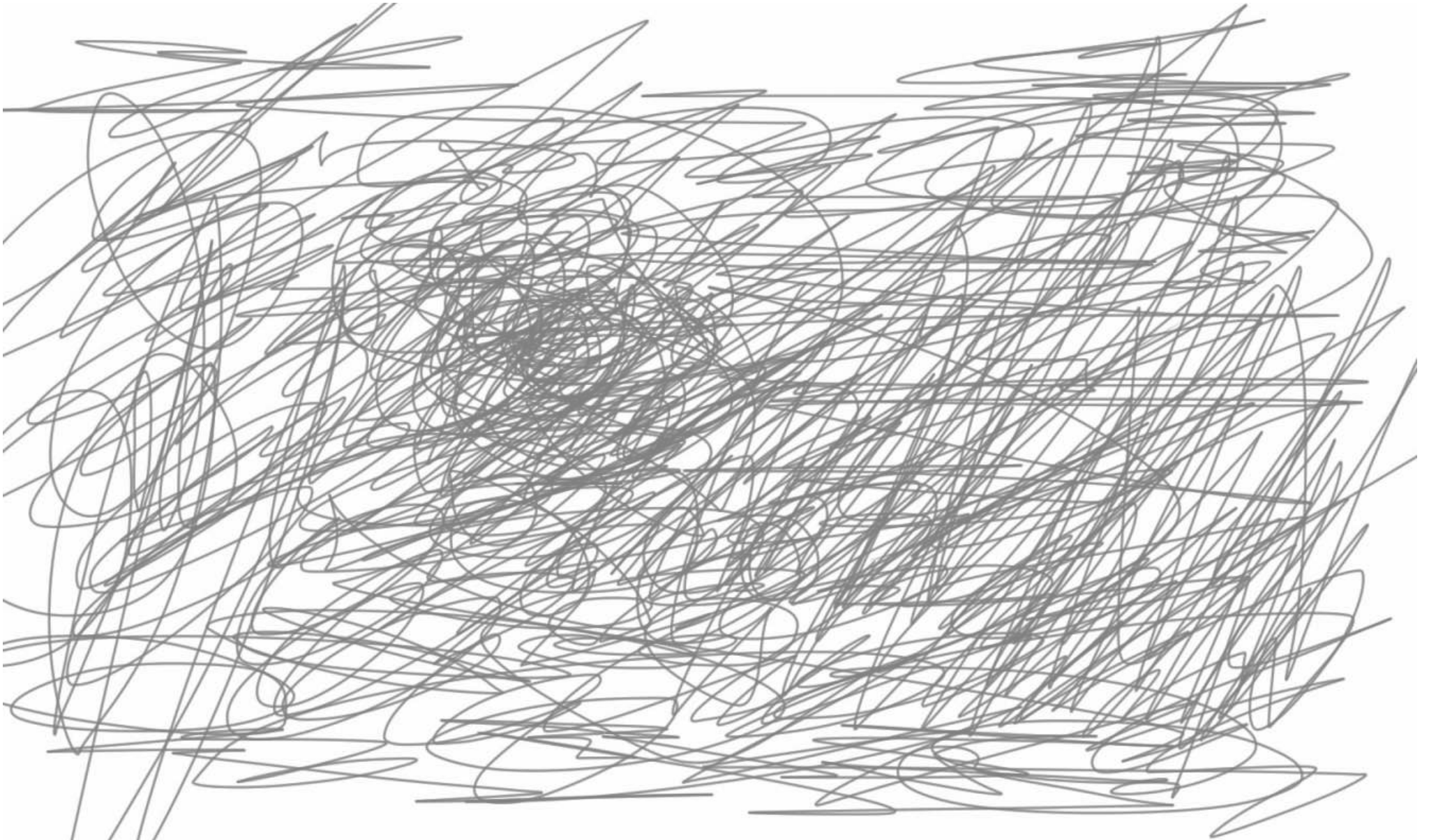
 ruud.cox@improveqs.nl

A pacemaker for the brain

- A Deep Brain Stimulation system that features an advanced DBS lead with 40 individual stimulation points
- This advanced system is designed to allow more precise stimulation of the intended target in the brain and may potentially result in reduced procedure time and fewer stimulation-induced side effects



The context is a blur



How to evolve a Context-Driven test plan by James Bach.

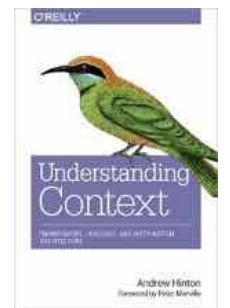
Who are the stakeholders?



Understanding context

“Whenever we’re trying to figure out what one thing means in relation to something else, we say we’re trying to understand its context.”

Understanding Context by Andrew Hinton.



Context-Driven Testing

“People evaluating a product by learning about it through experimentation in a manner organized and motivated by a systematic consideration of all the factors that significantly influence the problems and solutions that lie within the scope of their mission.”

Context-Driven **Testing**

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Context-Driven Testing

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The Product Ecology method

To make the context clear

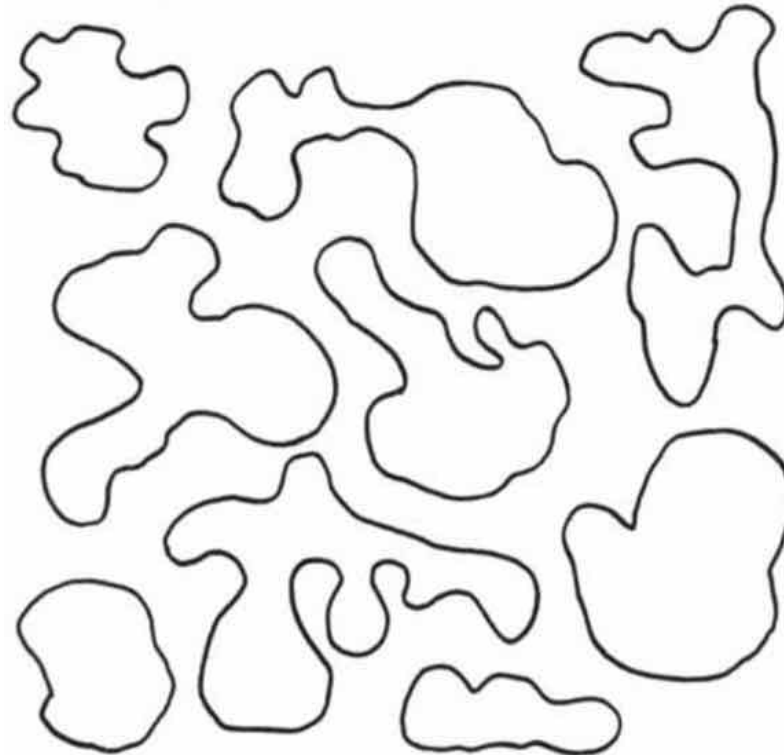
- Analyze the environment of the product from different perspectives
- Make the invisible visible

Face it



2 minutes

Draw some shapes on a piece of paper. They should be closed curves but otherwise can be as weird and irregular as you want.



Face it

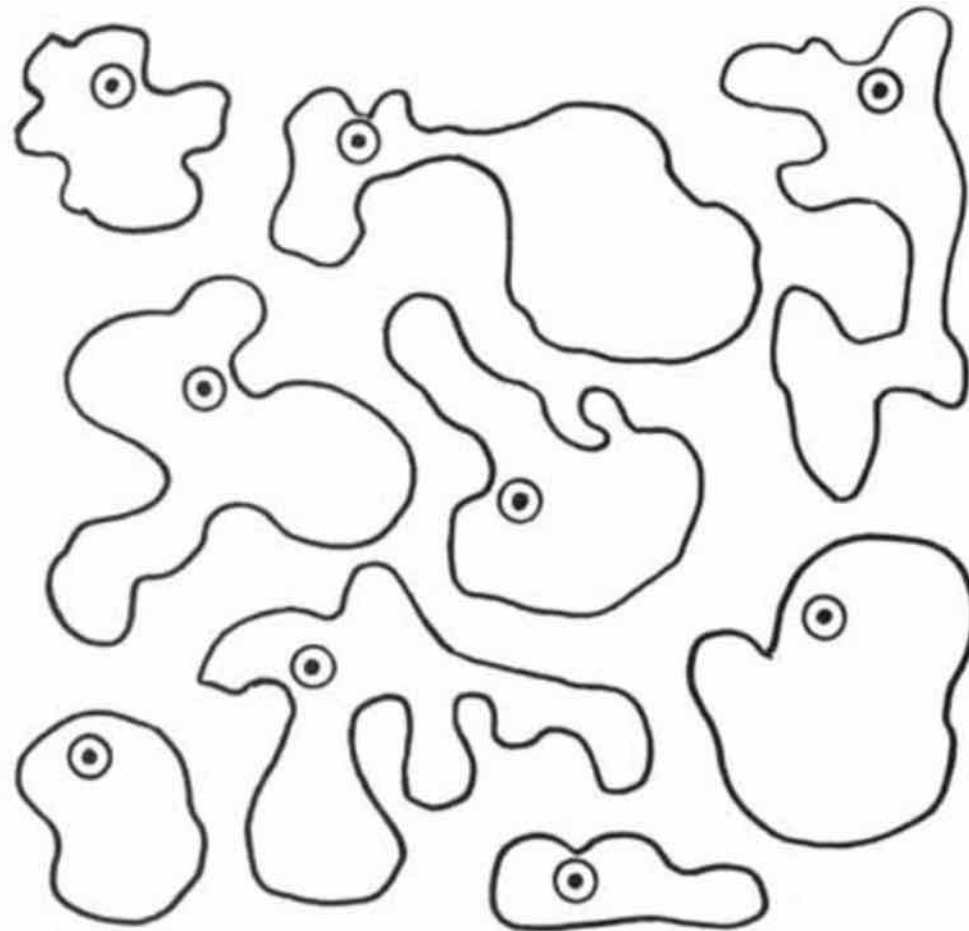


1 minutes

Now, convert each shape into a face by adding the following shape.

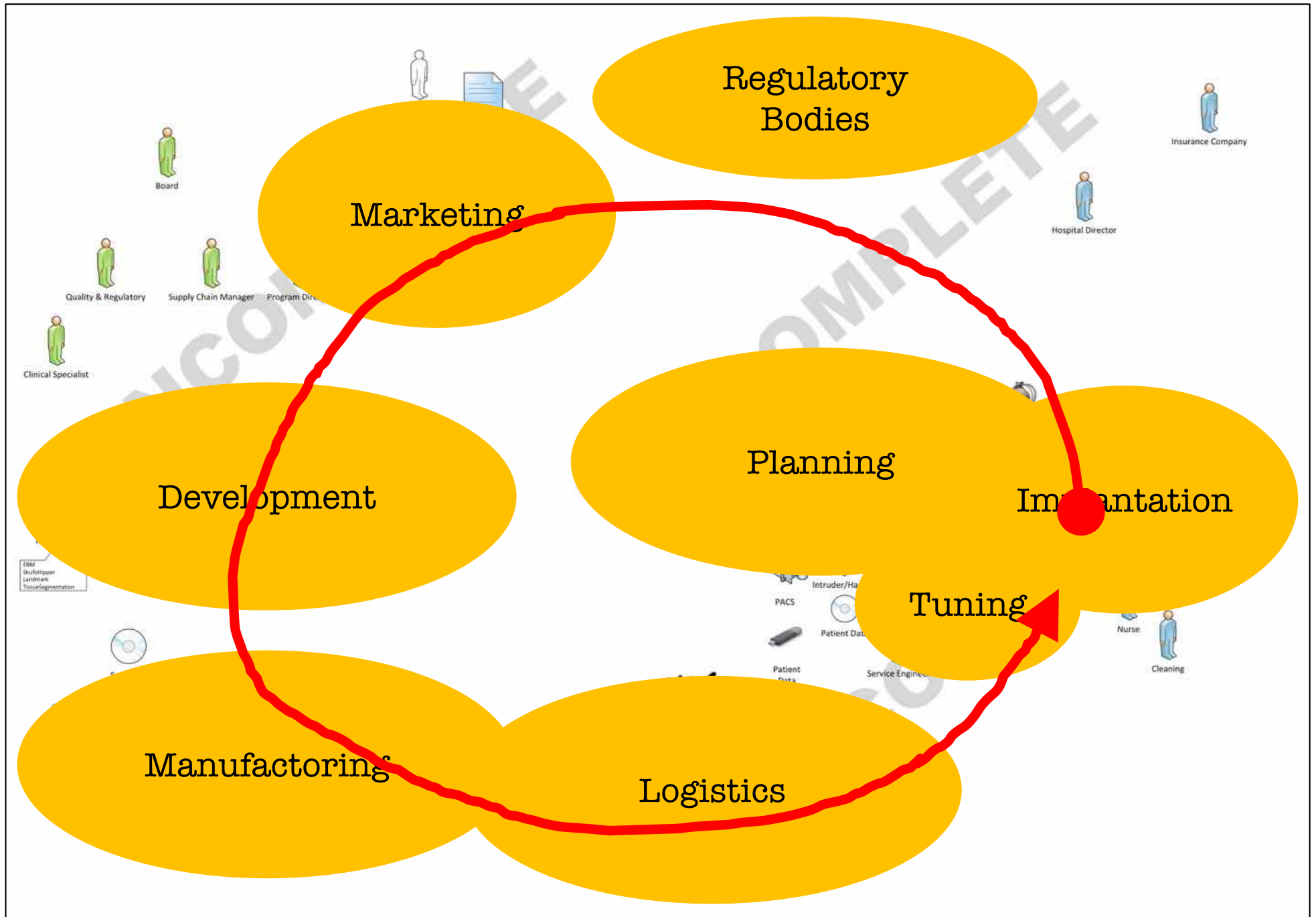


Your brains are a belief engine

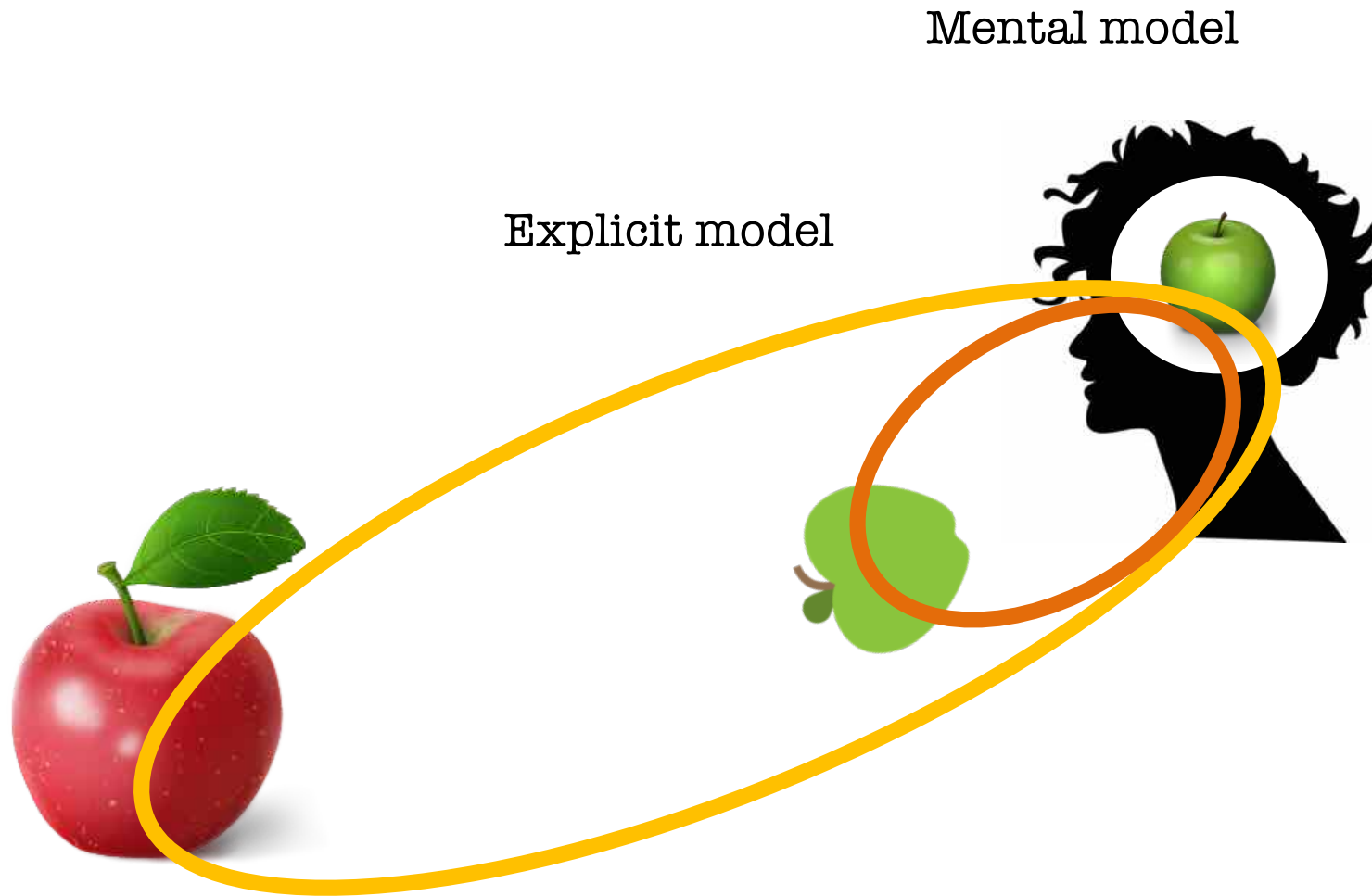


Understanding Comics by Scott McCloud.



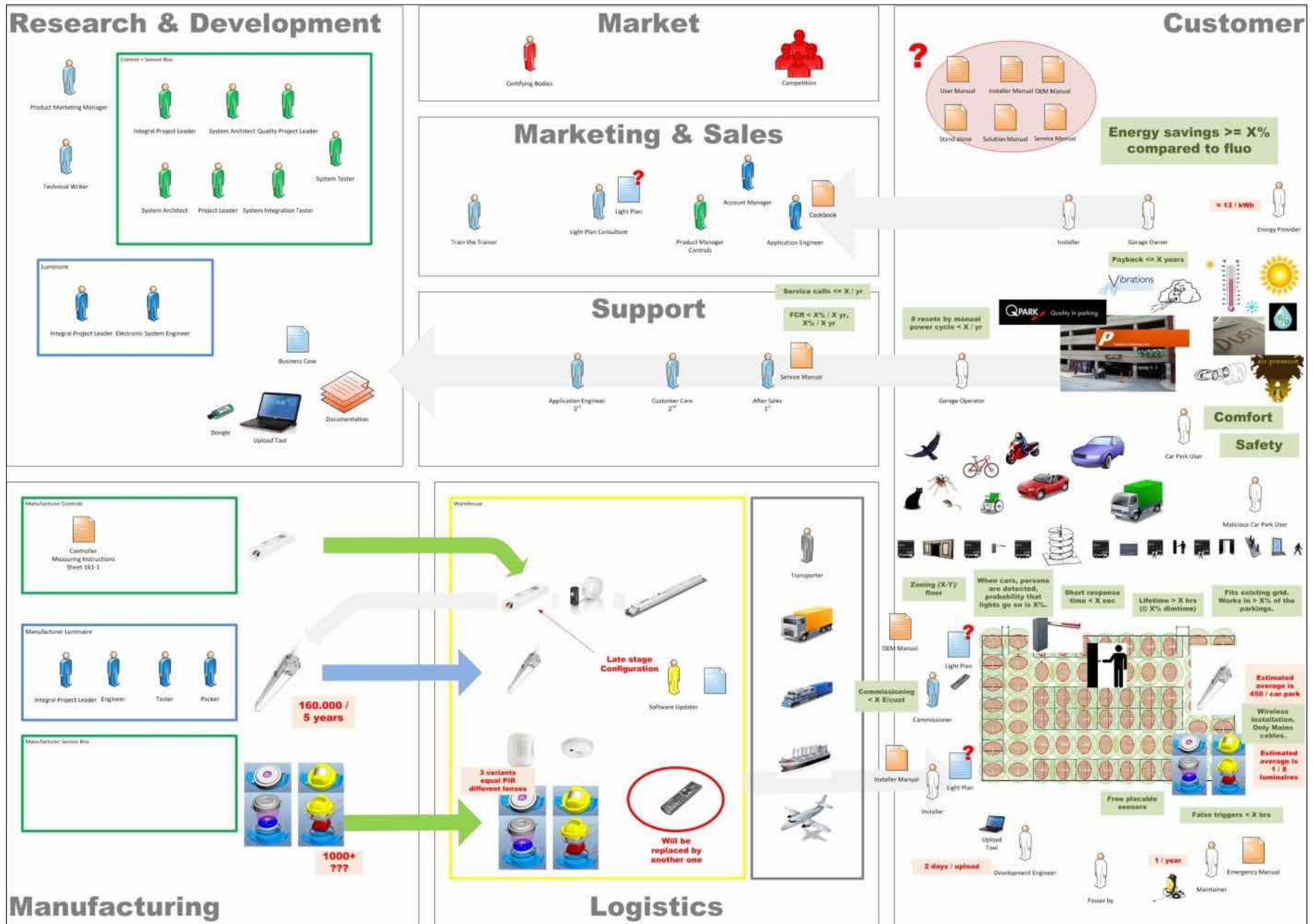


The power of visualization



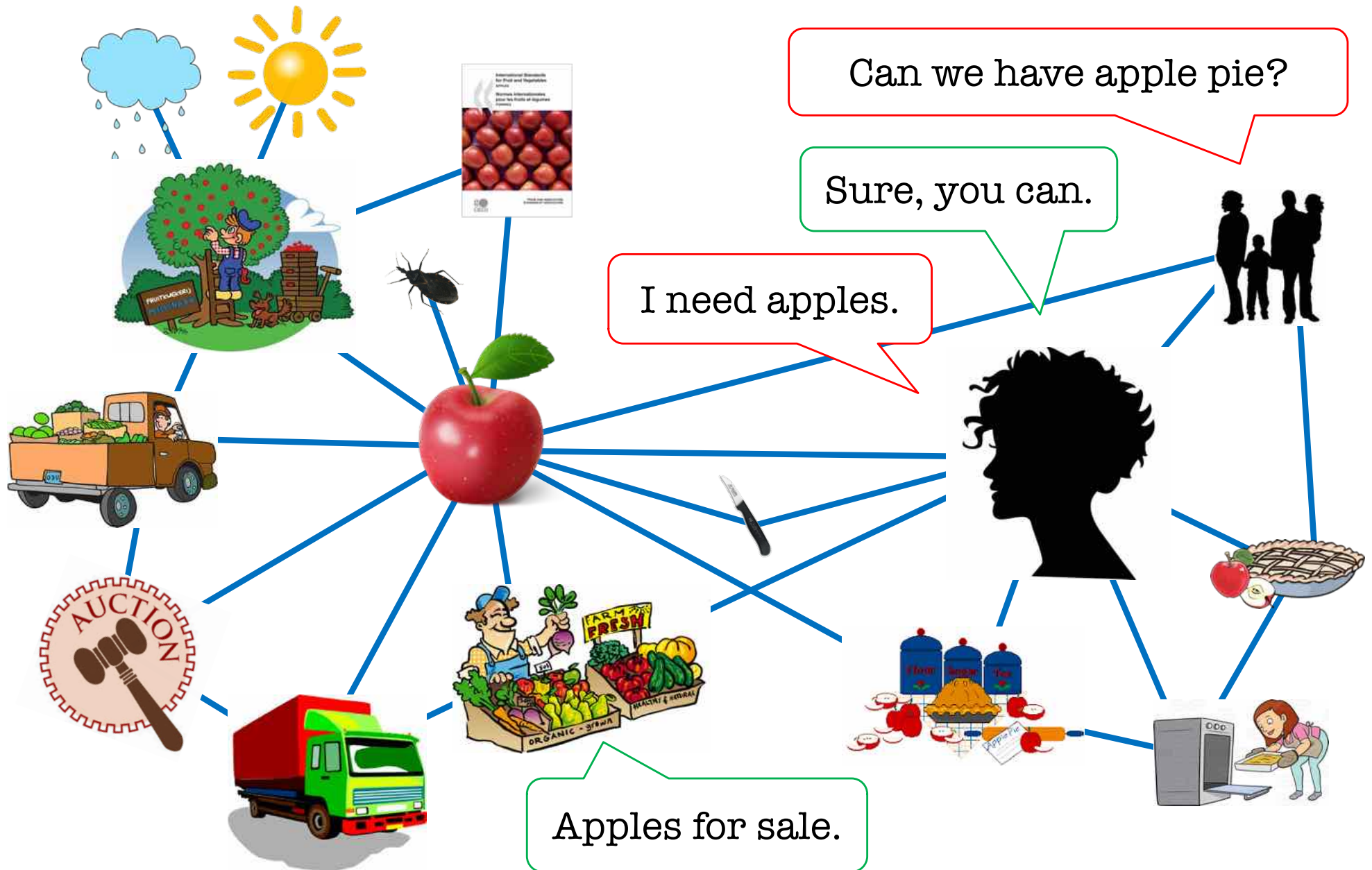
Reasons I build visual models

- Promote understanding
- Discover hidden requirements
- Provide measure of progress
- Discover new insights
- Discover new questions
- Support explaining
- Analyze impact of changes
- Train new people
- ...

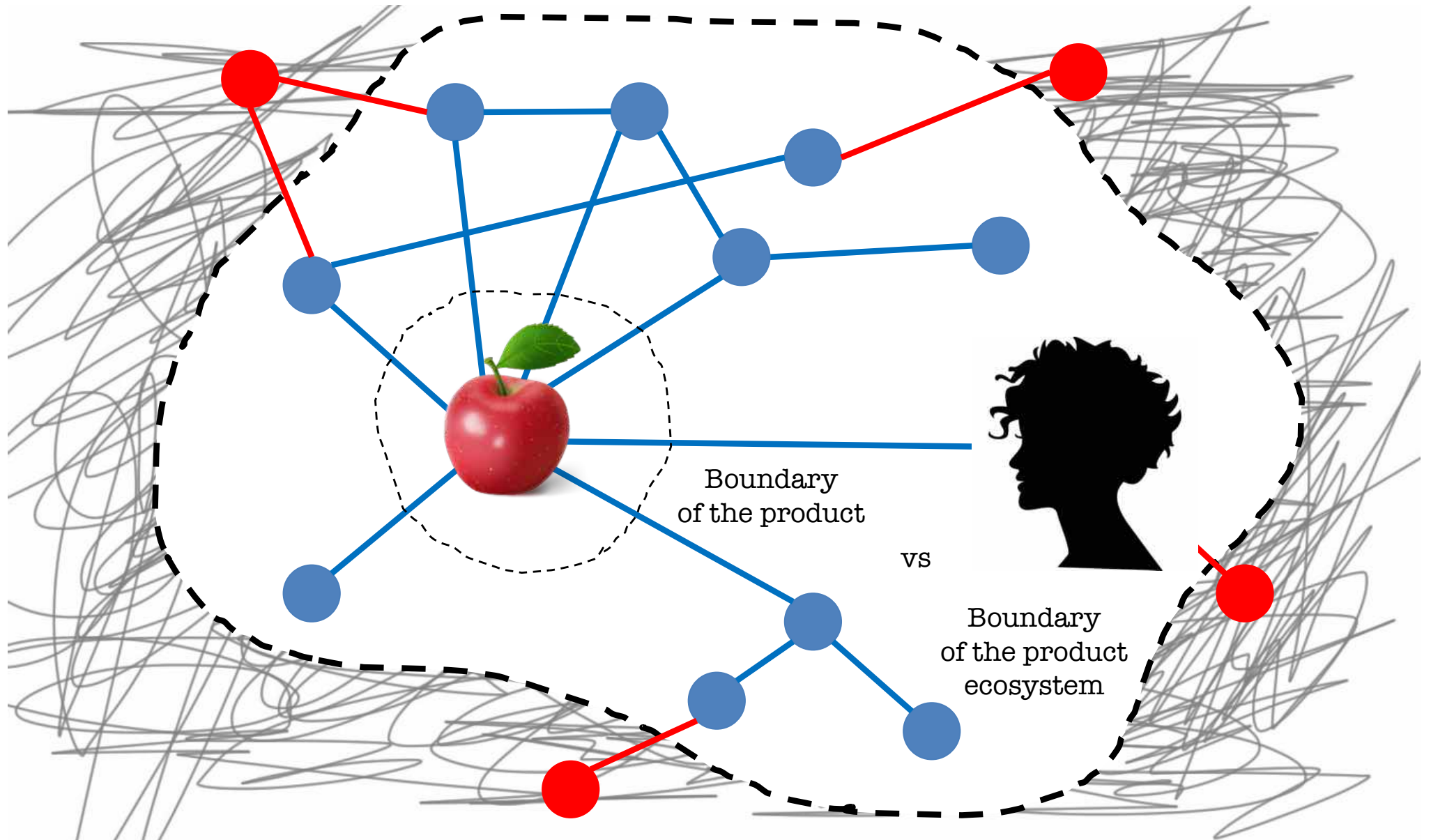


See [An Example of a Product Ecology for Testers](#) by Ruud Cox.

Product Ecology of apple pie



Boundary of the product ecosystem



Heuristics

- Problems, Solutions
- Producer, Market, Consumer
- Product, People, Process

- Value Chain
- Supply Chain
- Product Life-cycle
- User Scenarios

- Focus, De-focus

A lighting system for car parks

- Design a lighting system for car parks that consumes less energy than current systems
- Don't compromise on comfort feelings and safety
- ROI \leq 2 years



Heuristics

Problems, Solutions

What is the problem that we are trying to solve?

What is our solution to the problem?

What other solutions were proposed or evaluated?

Producer, Market, Consumer

Who has a problem and who provides a solution for it?

Any market related factors that should be taken into account like competitors, standards or regulations?

People, Process, Product

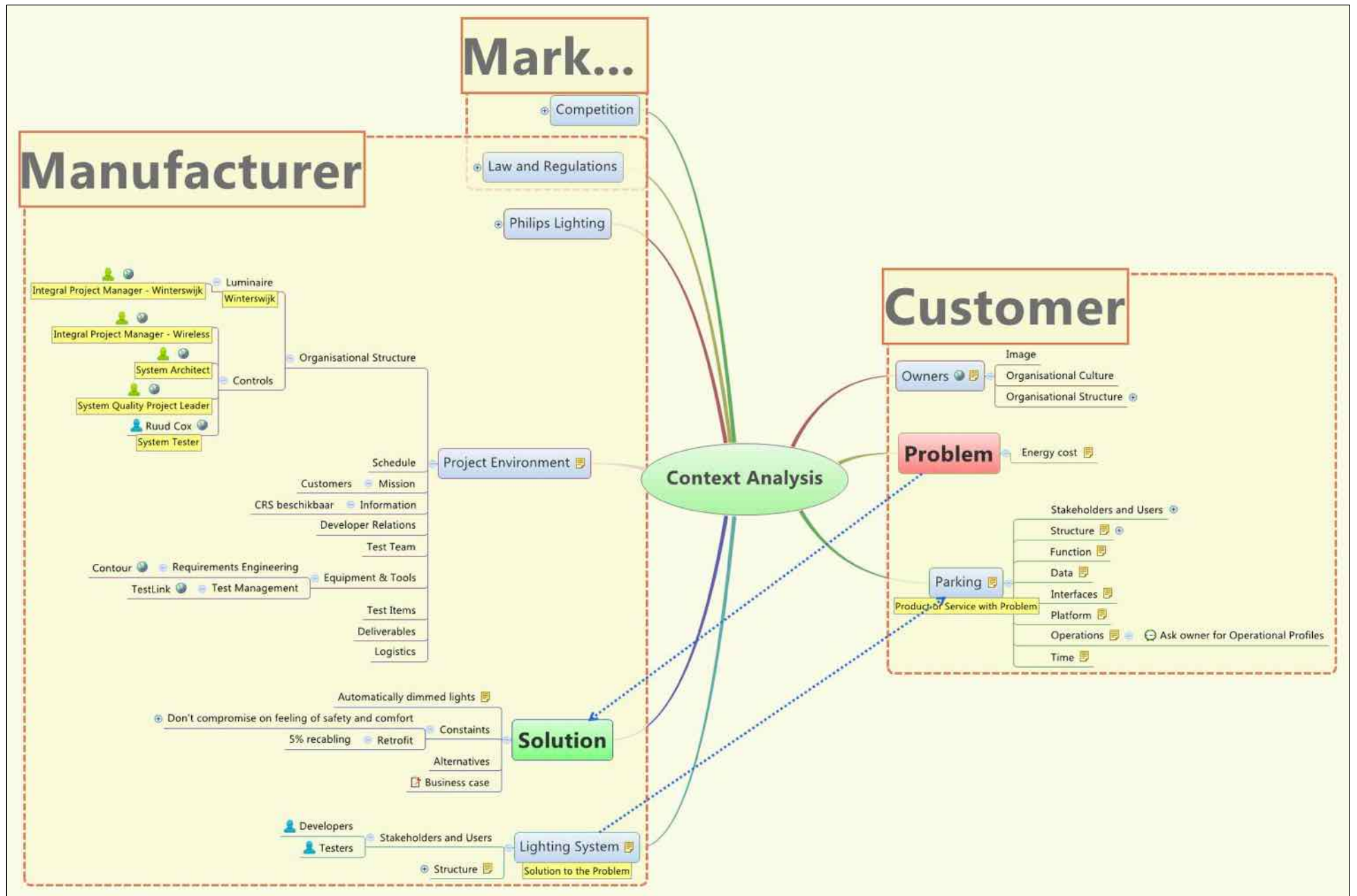
Products are made for people by people according a process.

How are the people organized i.e. projects, departments, responsibilities.

Who and where are the domain experts?

What does the product development process look like?

What are the elements of the product?



Market

Producer

Consumer

People

Problem

Product

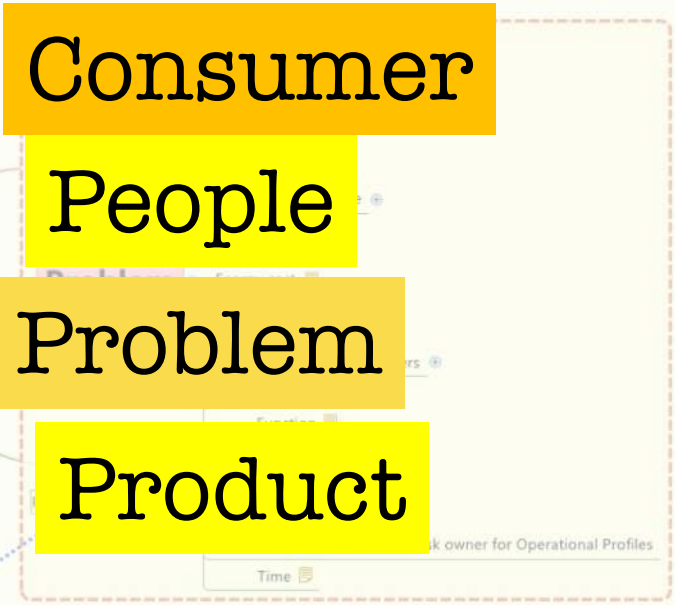
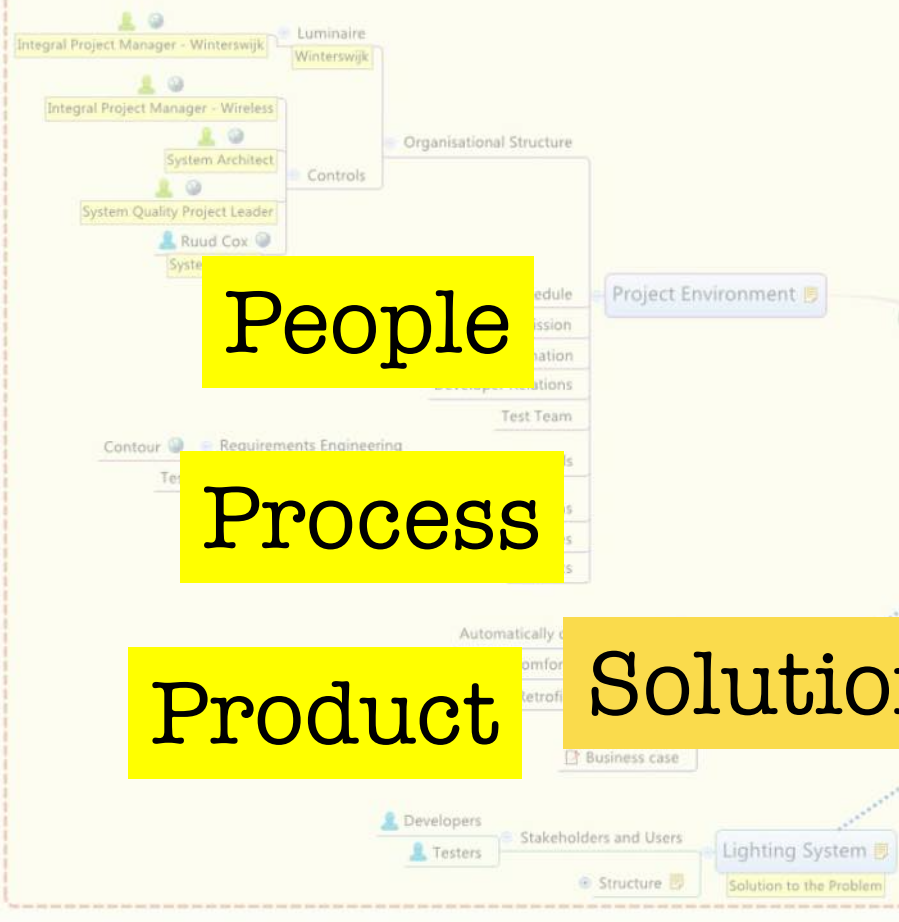
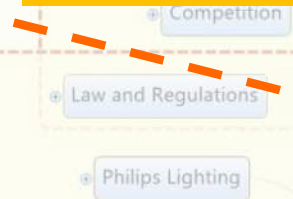
People

Process

Product

Solution

Context Analysis



core team Wo 11-12-

Rogier DeLuij
Functie Owner Sensing
PIR - kelen. Byenkort.
EEC 604.

Competition.

regulation.

market segment.

Owner (Qpart)

uncertainty
system payback time ≤ 2 yrs.

Richard van Pelt.

org culture

org structure

why? -

reduce energy costs.
(lighting 70% van energy costs.)
without compromising on safety
unsafe feelings customers.

Business

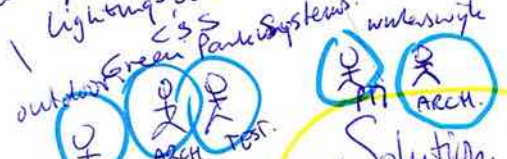
Image
- empathetic
- trust worthy
- knowledgeable
- courageous
- capitalizing.

org culture.

Owner

Peter Fitzki ARCH.
Zigbee team

org structure.
Philip Professional Lighting Solutions.
CSS
outdoor Green Parking Systems.



sys arch.
PST
did not react on any move.

Problem



intruder; sabotage; vandal

host.

neighbor

remanded in de buurt van een knipperende signaal

parking operation

installeer

van. installeer bicycle. person. bird, mouse, bee.

Under tanks.

- Temperature -
Ta -30 to +40°C

car (electron). van. installeer bicycle. person. bird, mouse, bee.

attributes

size.
texture.
movement-speed
pallam.

Solution.

(Green Parking Systems) SFDRPT

LED driven controller - Zigbee

physical grid - Zone.
logical mesh network
predetermined sensor area



service. Building household. remote control.

claim: green management.
DED. in information, command, or duty
given to a person or group of people

stress. - monitoring
druk bewelde. parkeren garage.

Installation. cost.

Commissioning. 100%?

Cost. electrical installer.

edle (green work)

Computer



electrical installer.

Market

Producer

Consumer

People

People

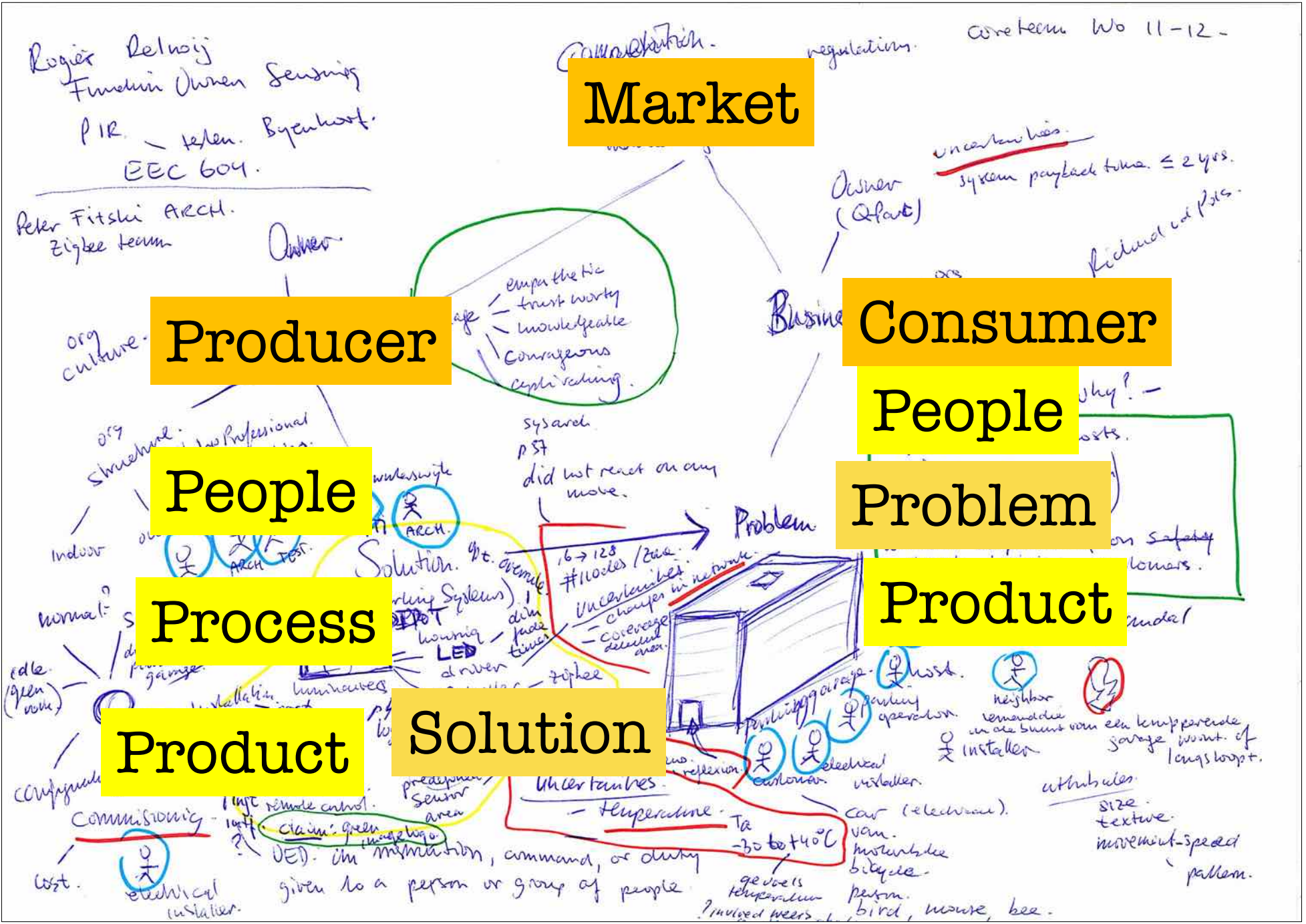
Process

Problem

Product

Solution

Product

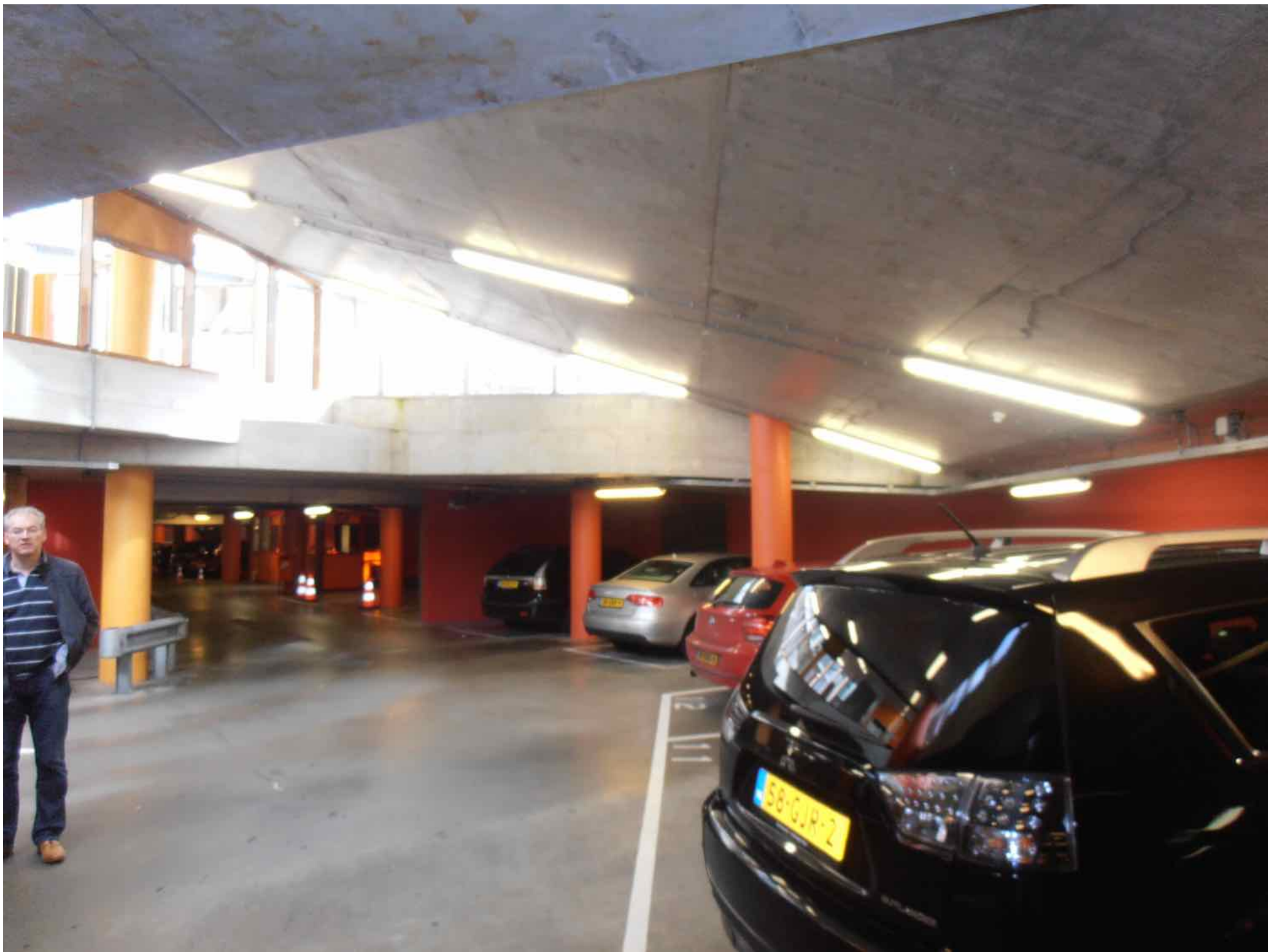


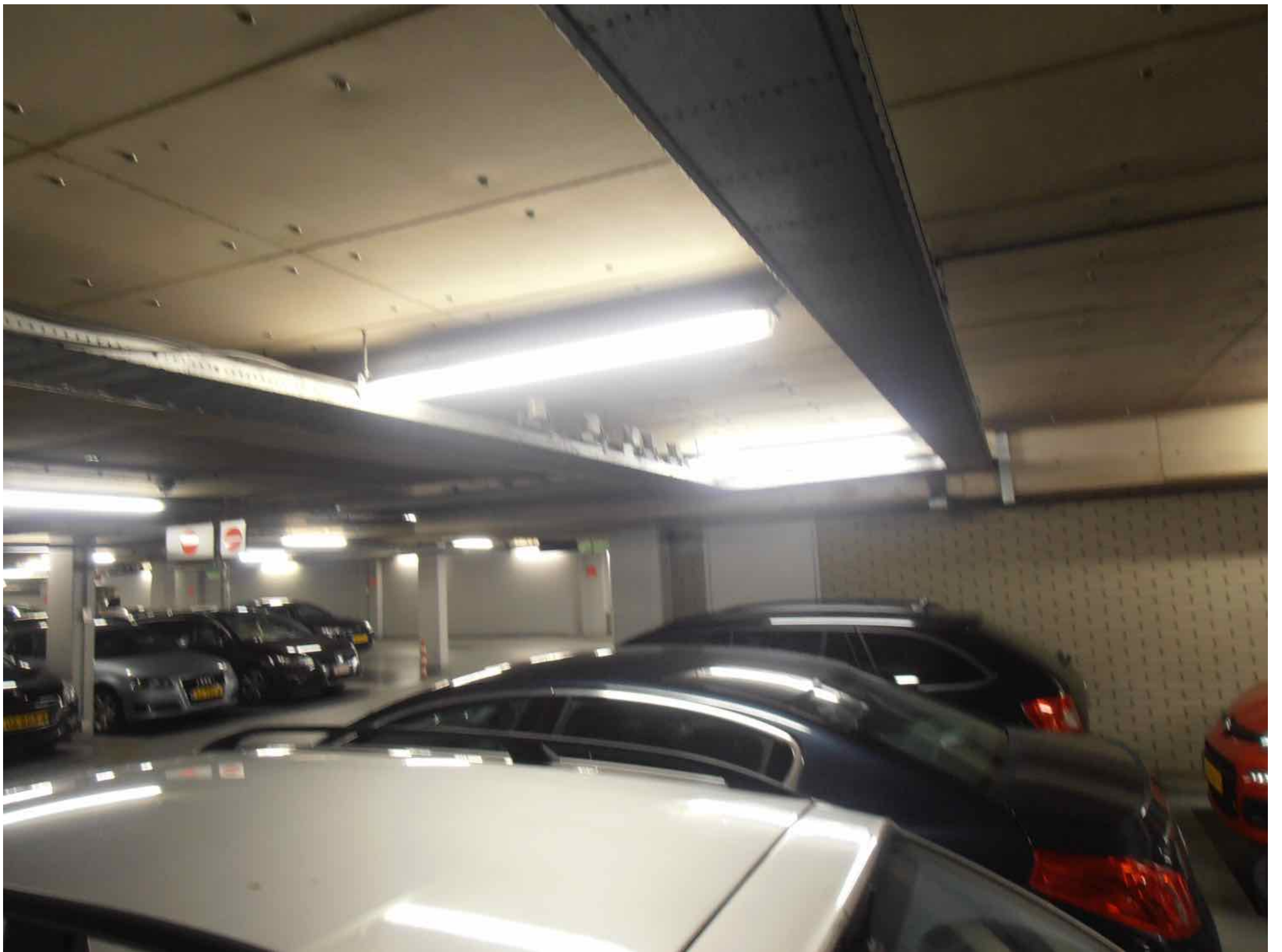
Things I do to gather factors

- Study artifacts which are available
- Interview domain experts
- Explore existing products
- Hang out at the coffee machine
- Site visits
- ...

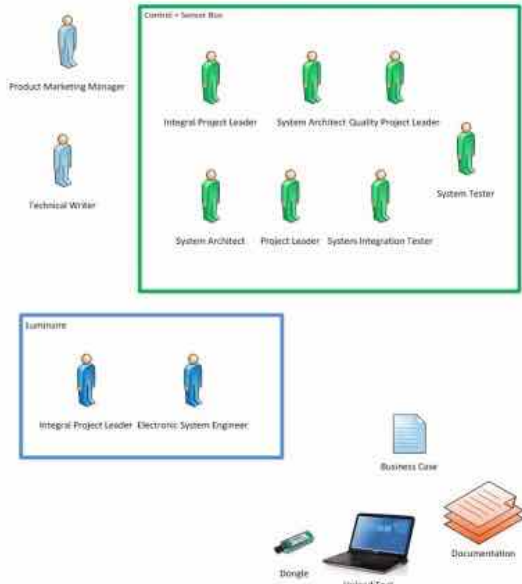








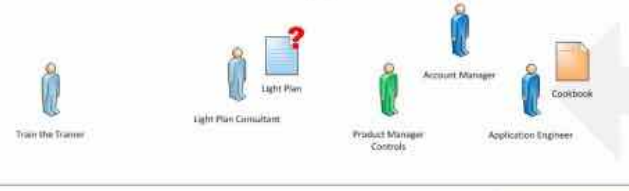
Research & Development



Market



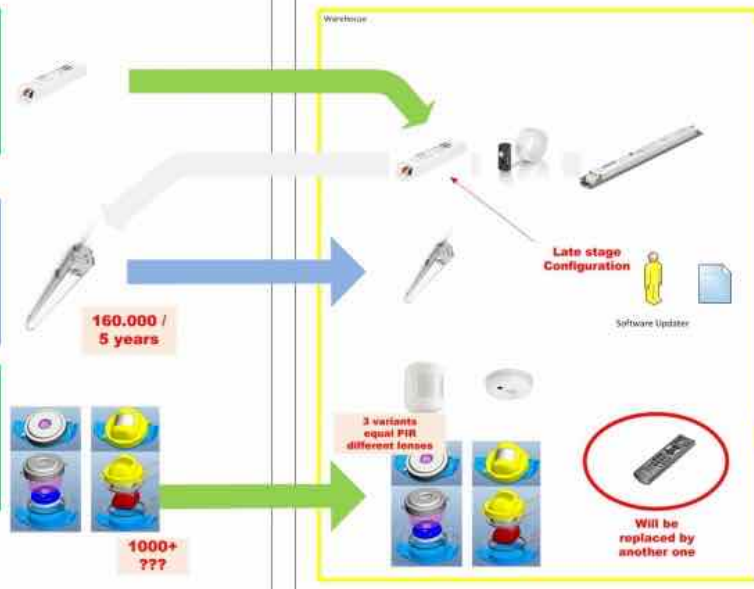
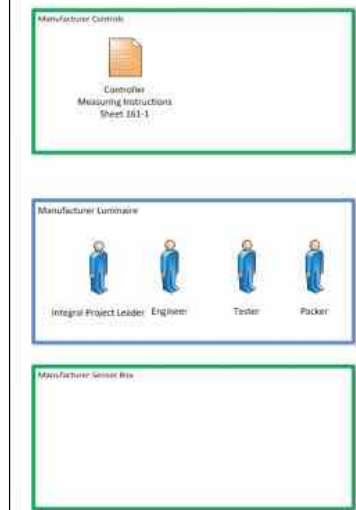
Marketing & Sales



Support



Customer



Manufacturing

Logistics

Heuristics

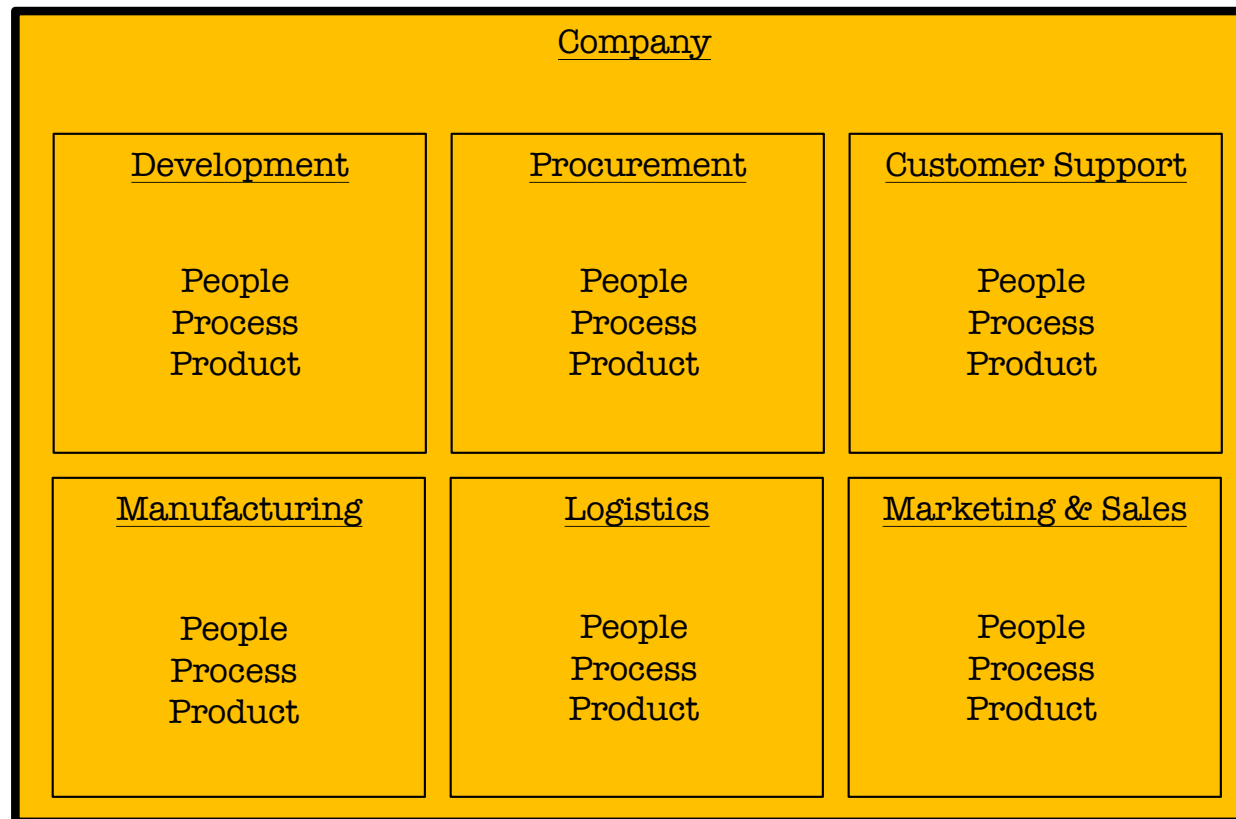
Value chain

Supply chain

Product life-cycle

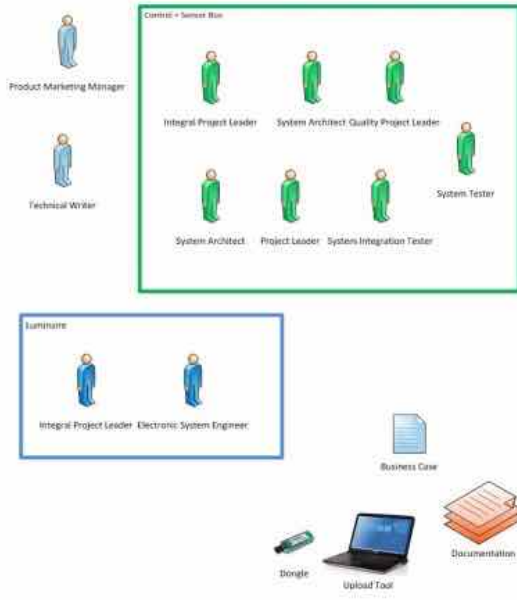
User scenarios

Value chain



A value chain is a set of activities that a company operating in a specific industry performs in order to deliver a valuable product or service for the market.

Research & Development



Market



Marketing & Sales



Support



Customer



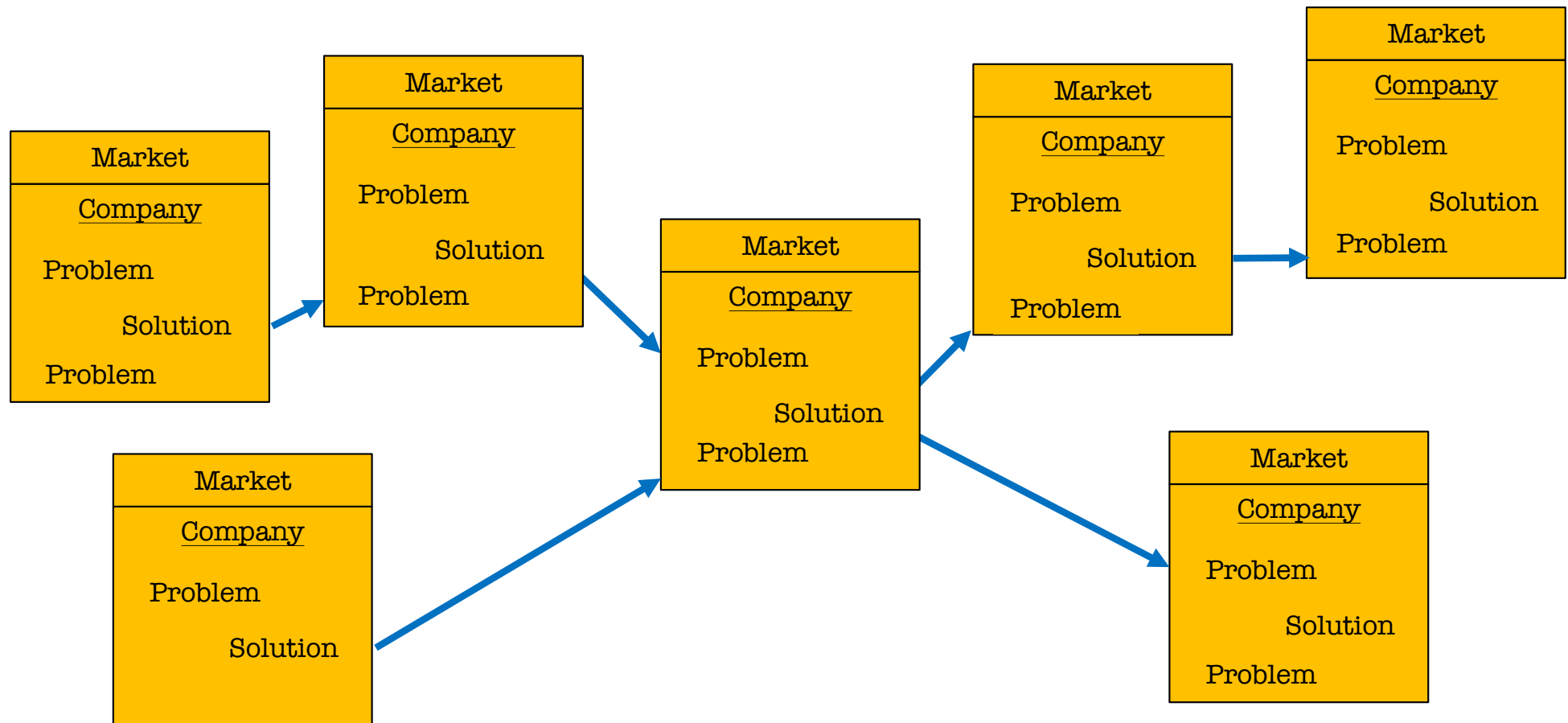
Manufacturing



Logistics

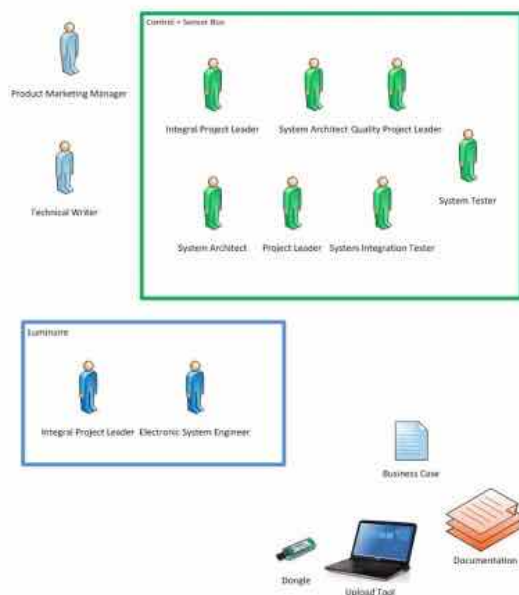
Manufacturing

Supply chain



Supply chain activities involve the transformation of natural resources, raw materials, and components into a finished product that is delivered to the end customer. Supply chains link value chains.

Research & Development



Market



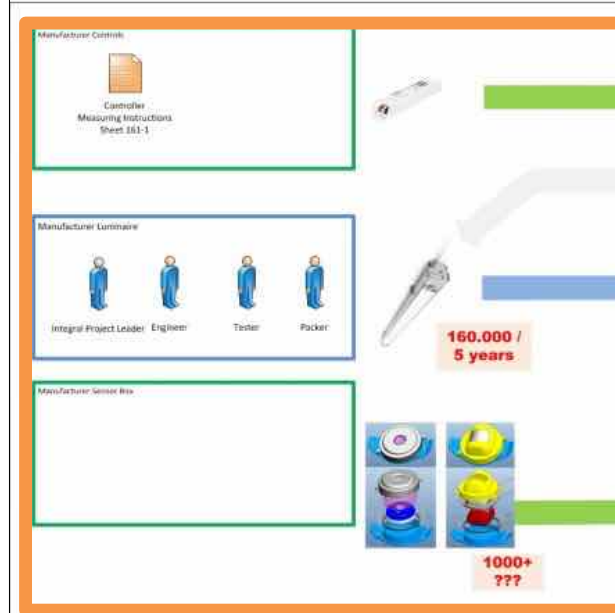
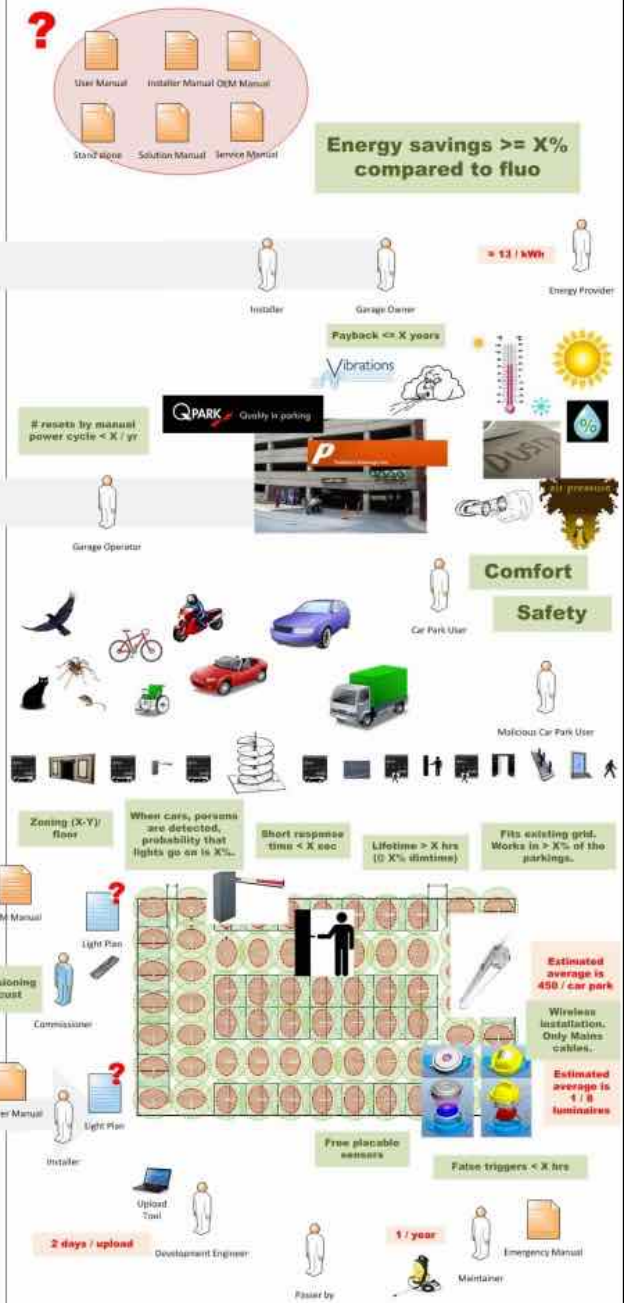
Marketing & Sales



Support



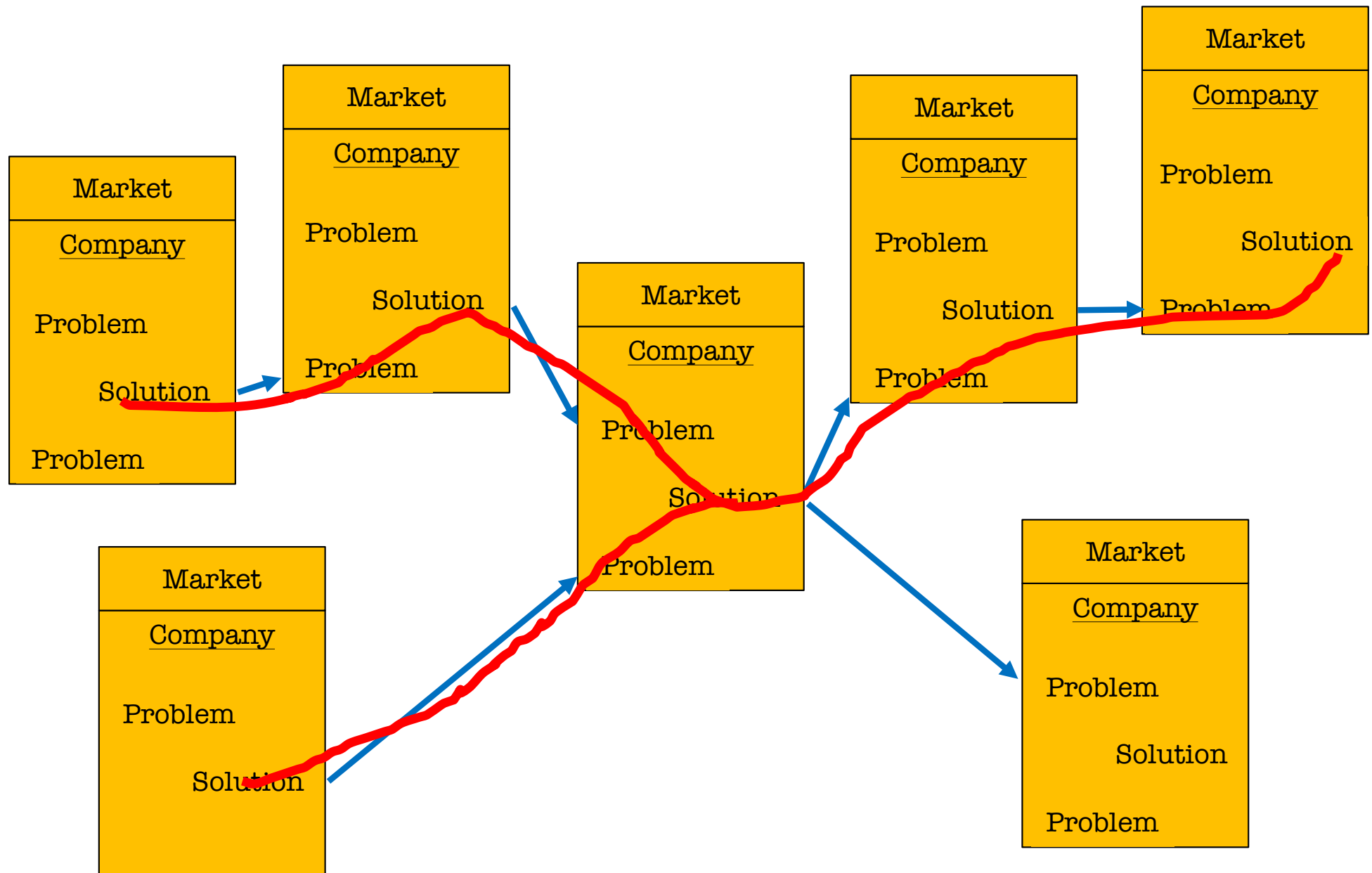
Customer



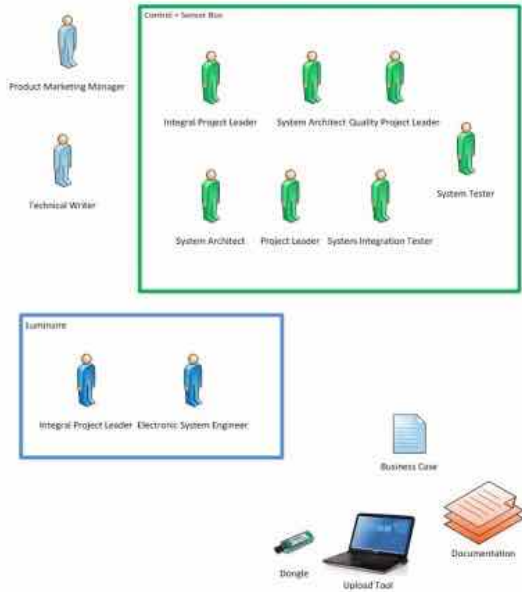
Manufacturing

Logistics

Product life-cycle



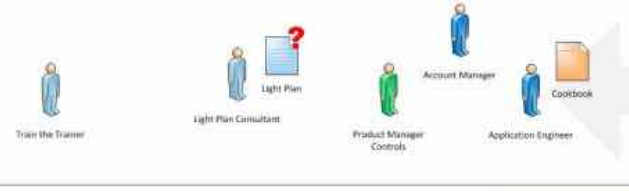
Research & Development



Market



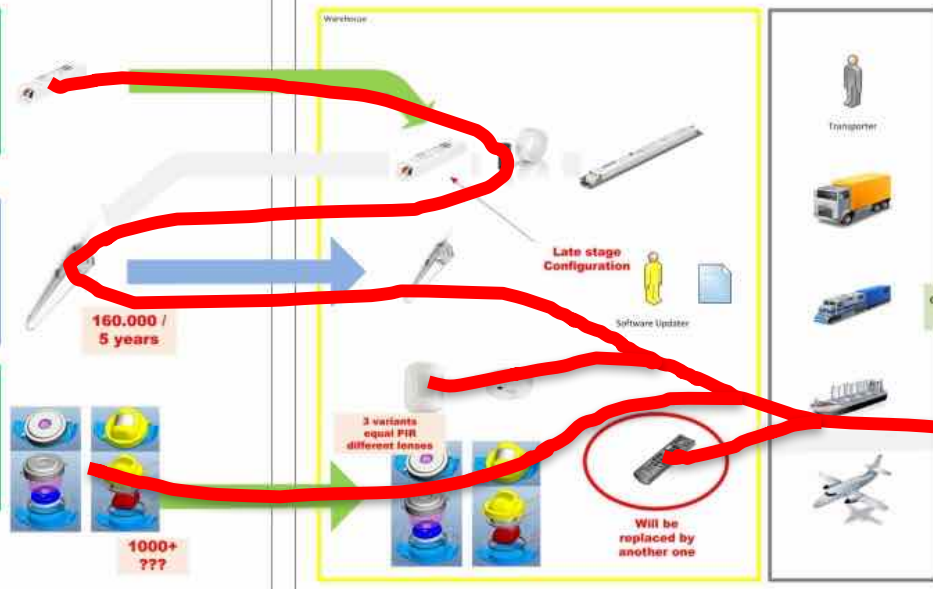
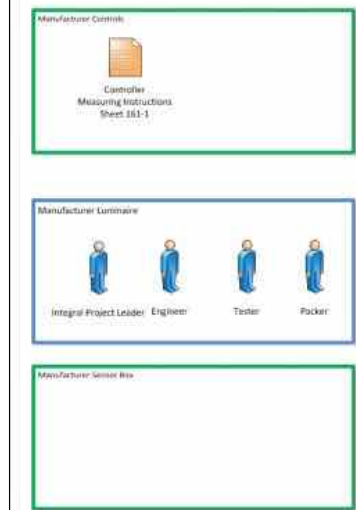
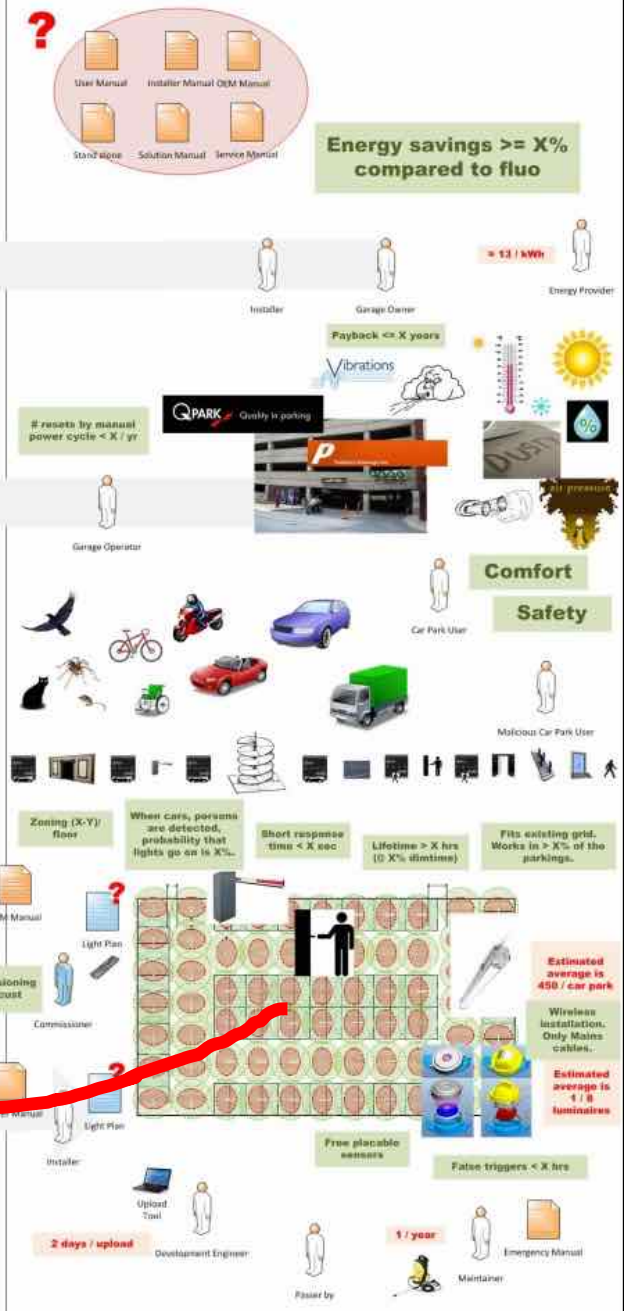
Marketing & Sales



Support



Customer

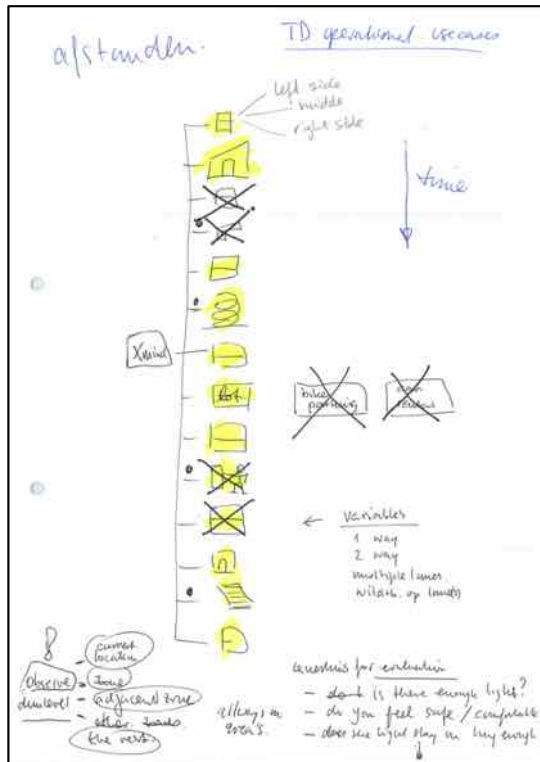


Manufacturing

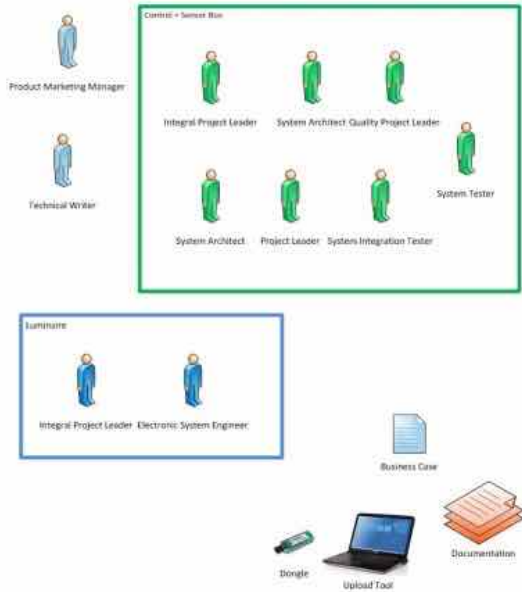
Logistics

User scenarios

Describe a person's interaction with the product
e.g. people move around in a car park in
different ways. How should the lighting system
behave?



Research & Development



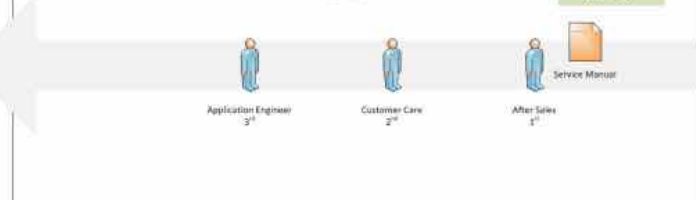
Market



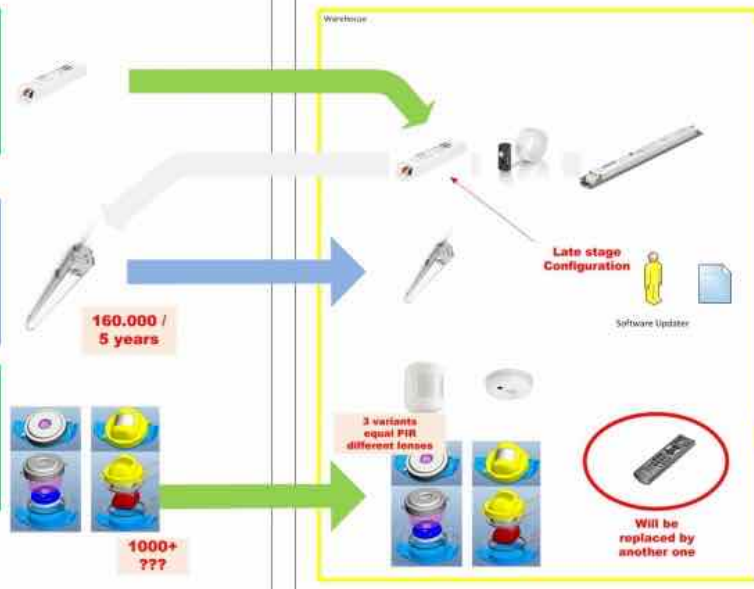
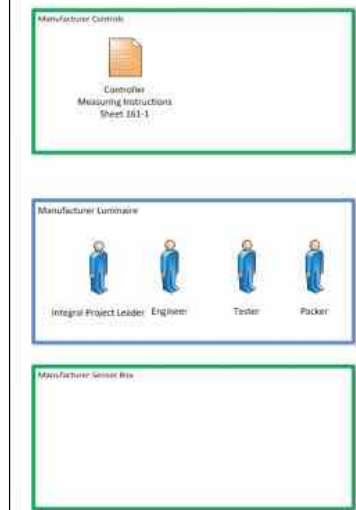
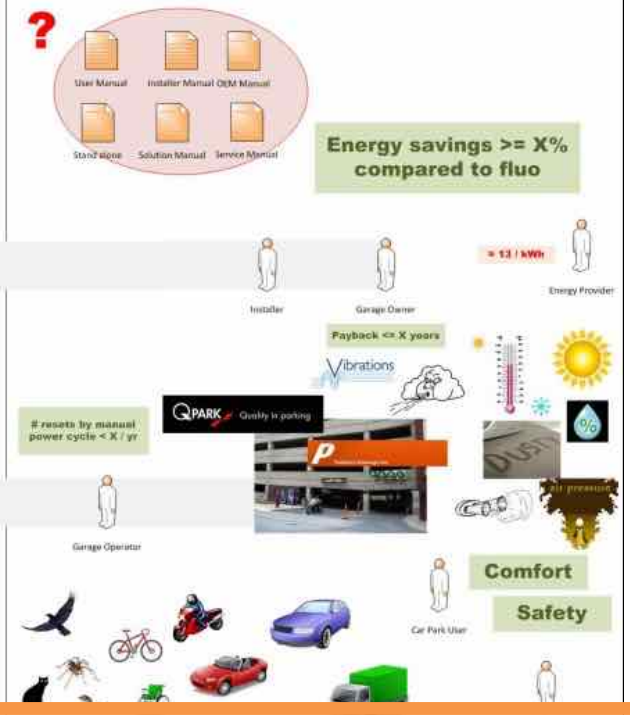
Marketing & Sales



Support

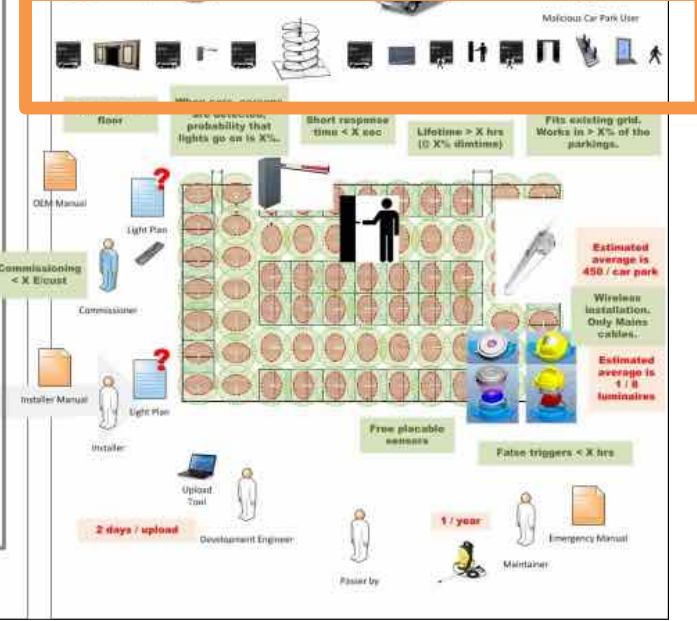


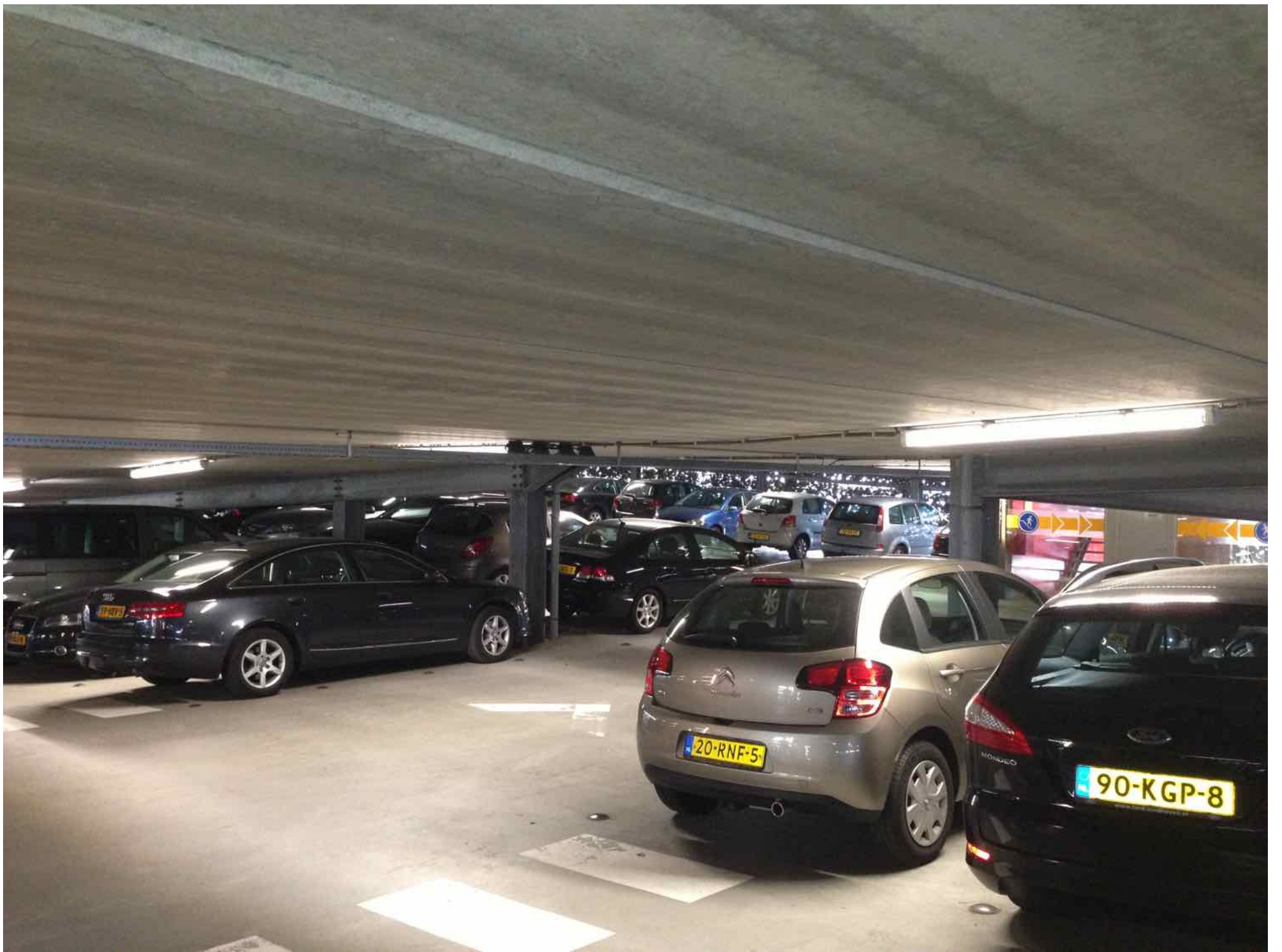
Customer

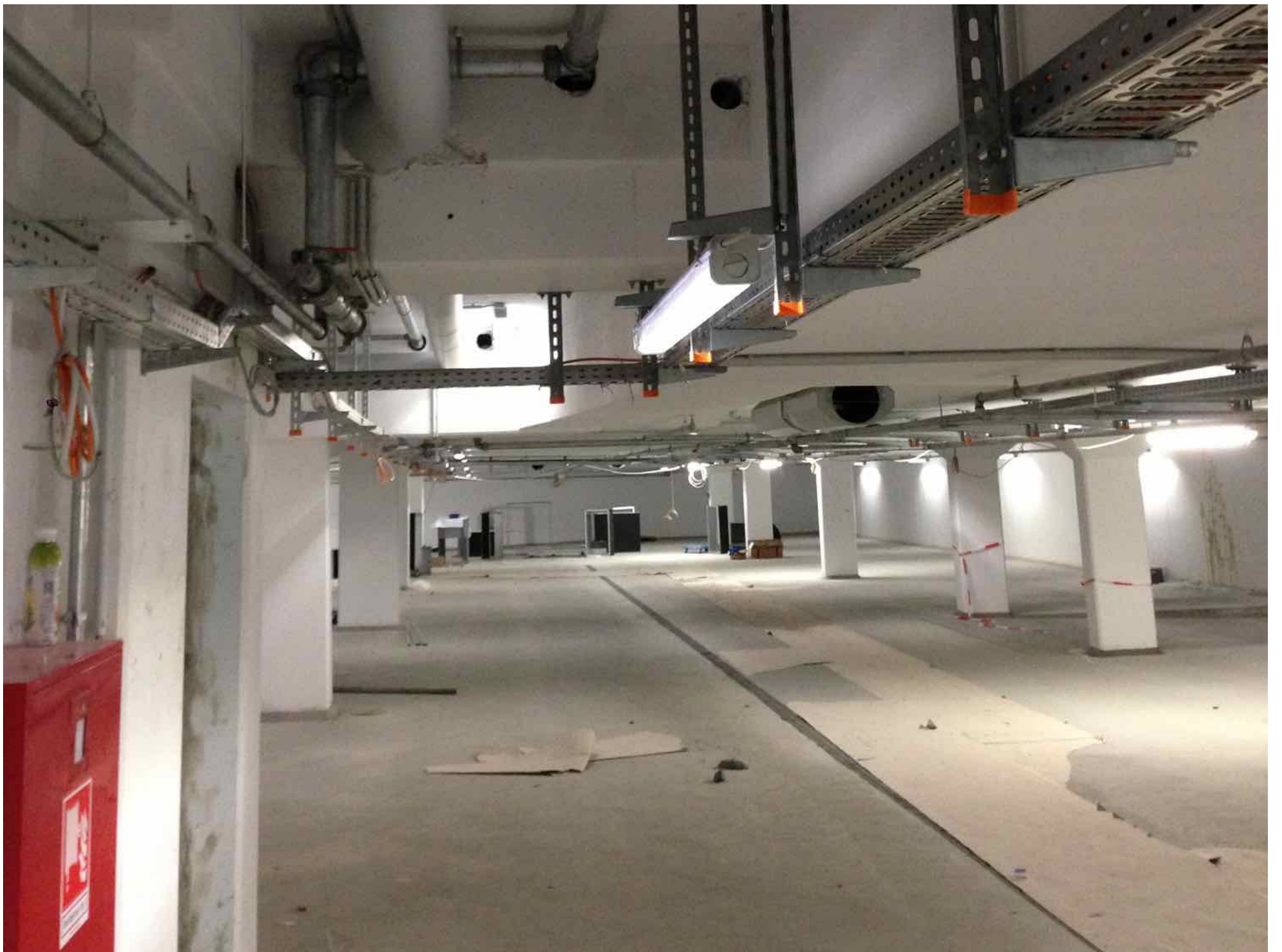


Manufacturing

Logistics



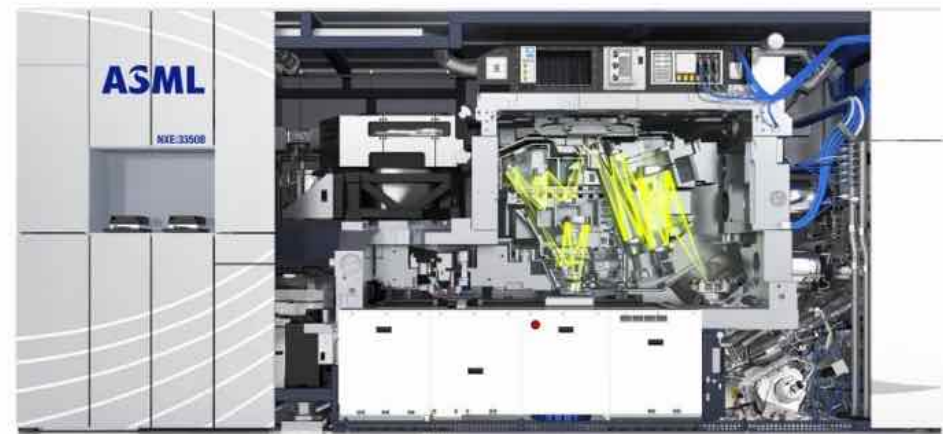




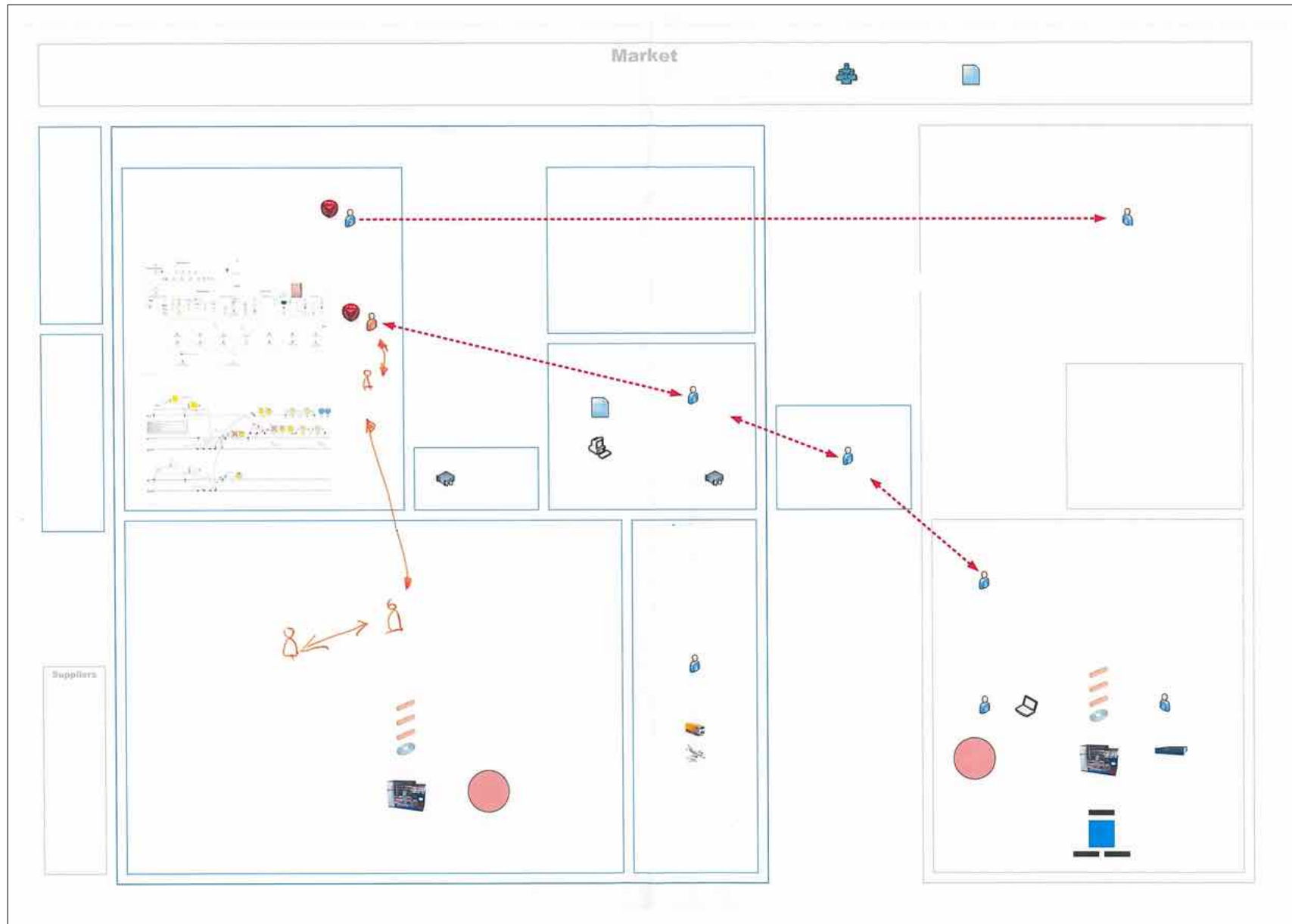
Expose circuit elements on silicon

A scanner is part of the complex process, called photolithography, that creates millions of microscopic circuit elements on the surface of tiny chips of silicon.

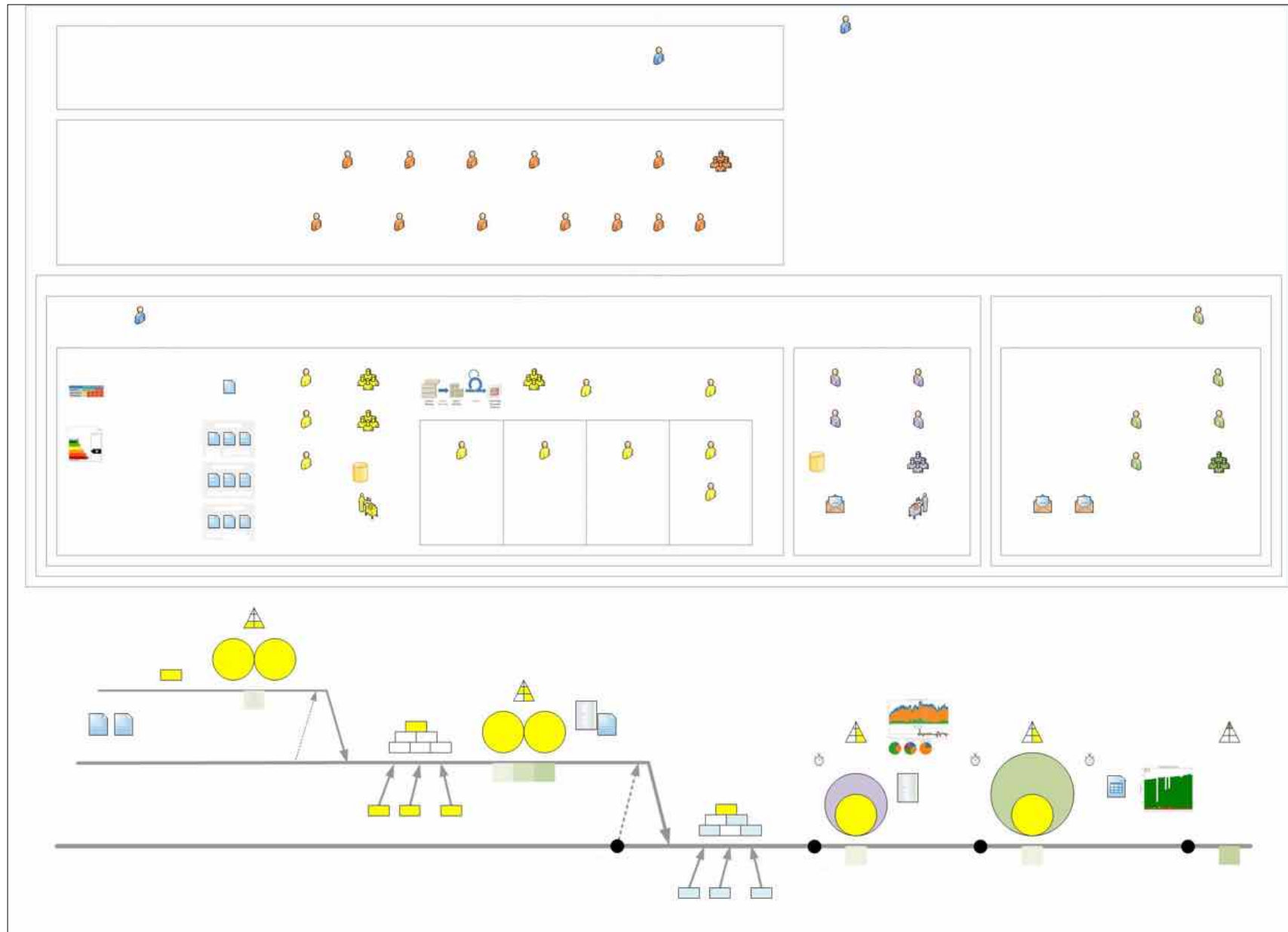
- Critical dimension, overlay, imaging, throughput.
- It takes months to fully process a wafer.



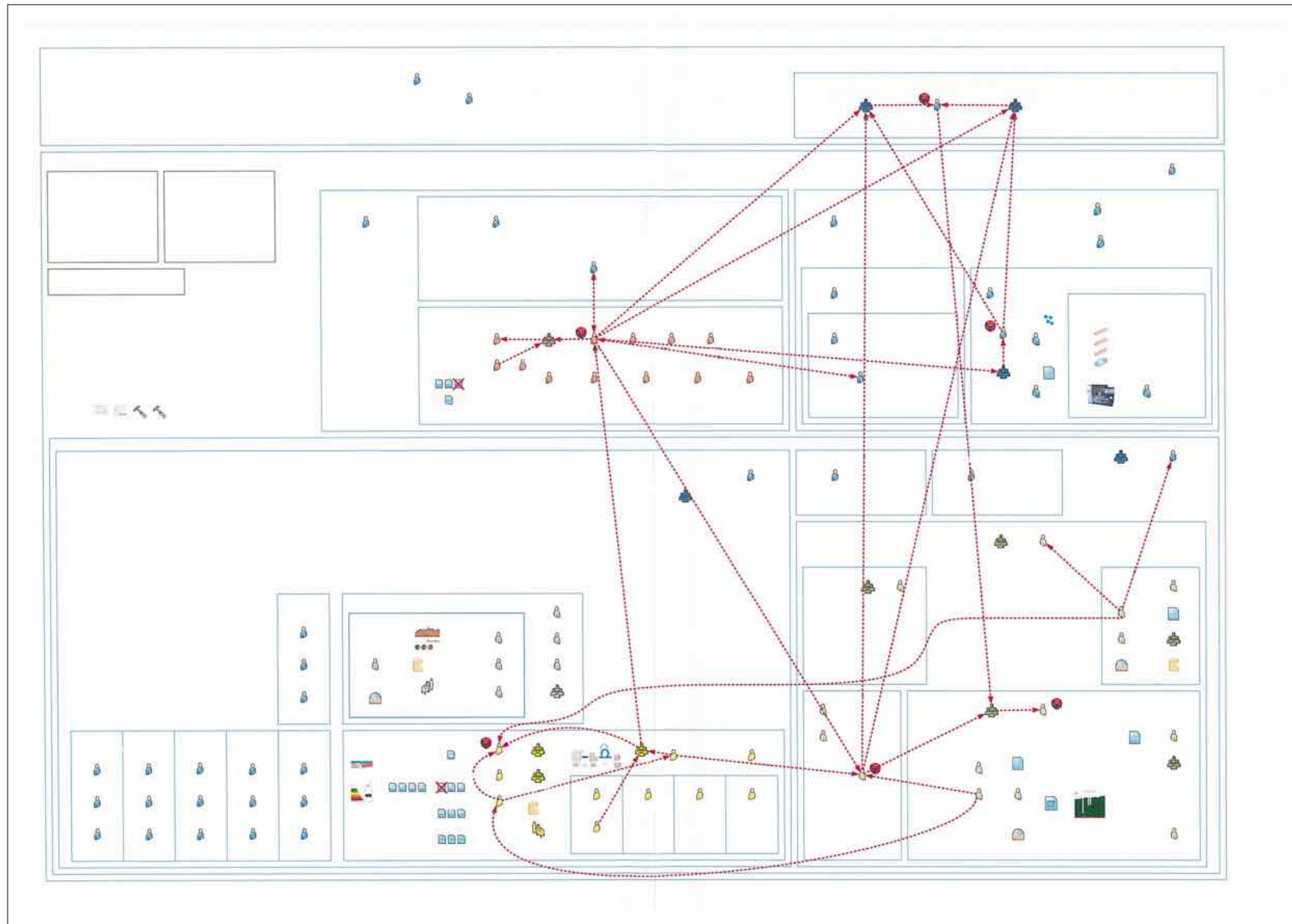
Product Ecology



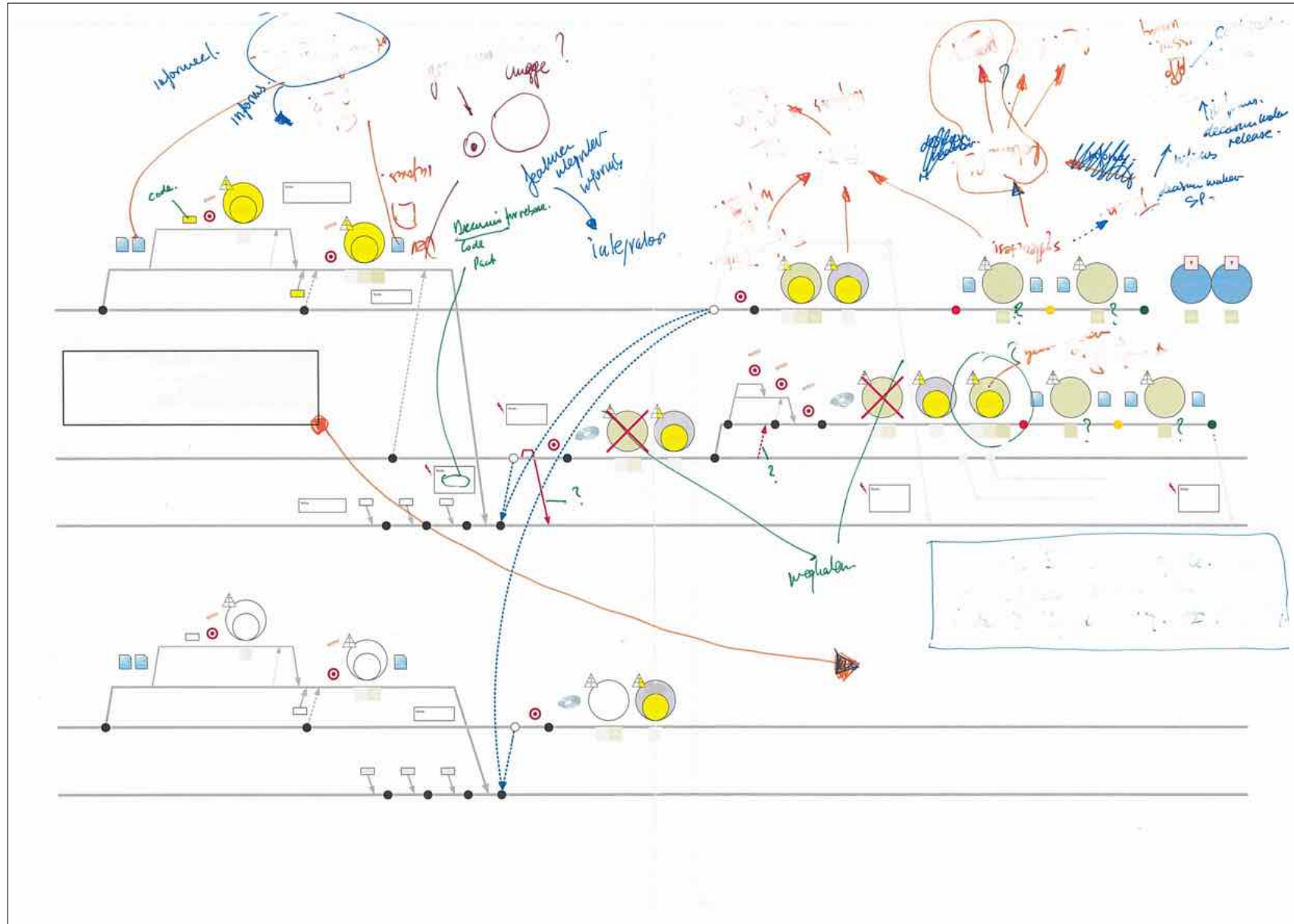
People, Process, Product



People, Process, Product

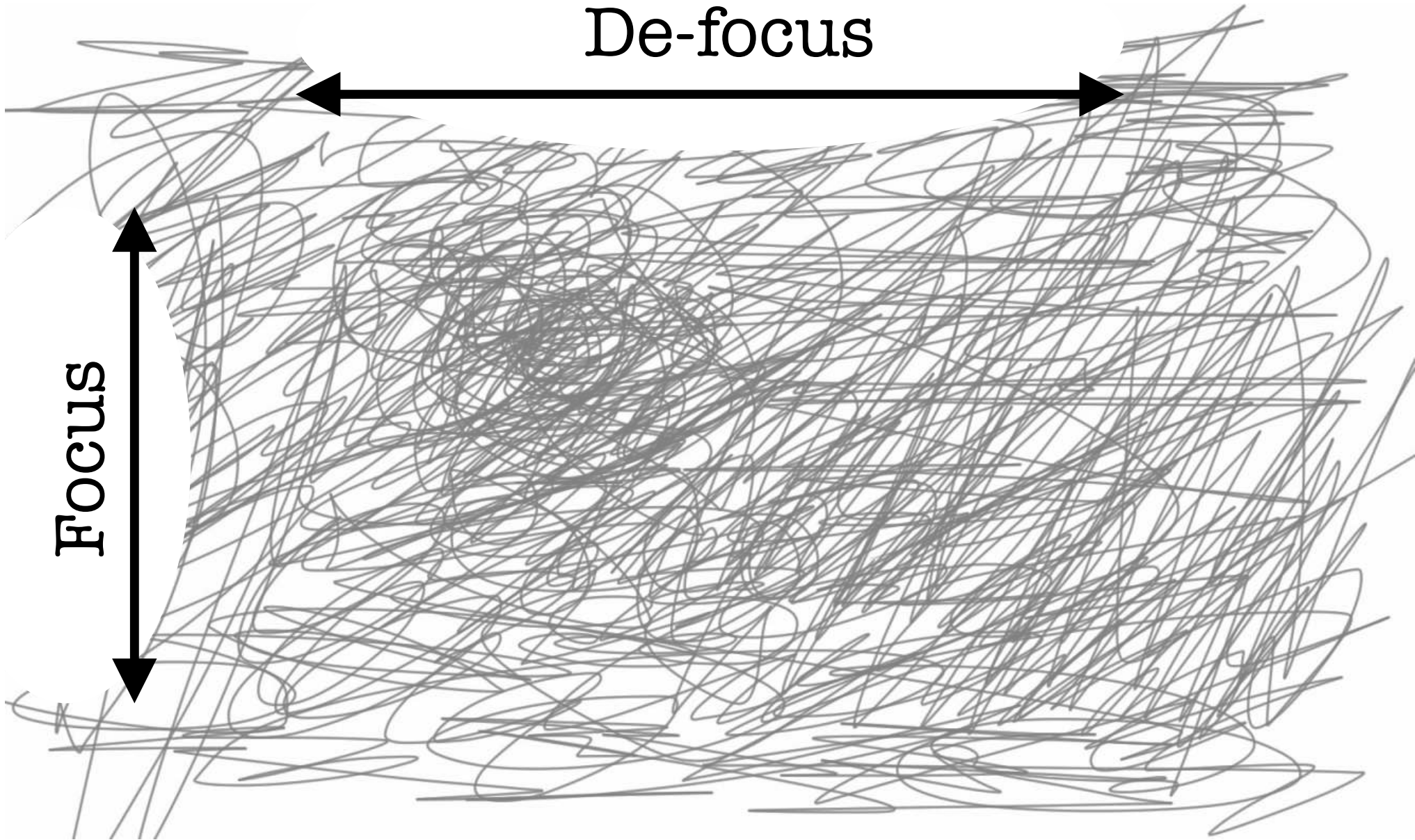


People, Process, Product



Heuristic

De-focus



FOCUS



Summary

Product Ecology is about making the context of the product clear

Identify important factors that influence the value of the product and the product risks

by analyzing the context from different perspectives

by applying heuristics

and making the invisible visible.

and creating visual models.

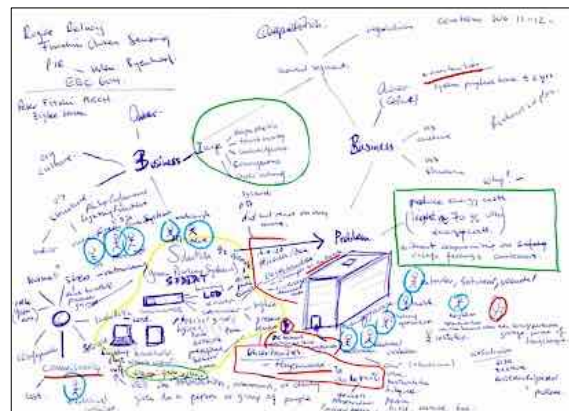
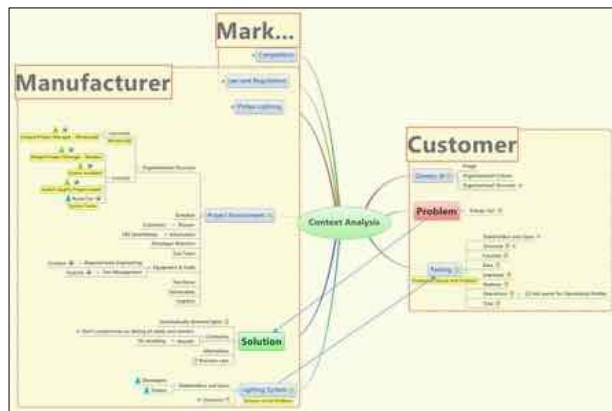
Heuristics

- Problems, Solutions
- Producer, Market, Consumer
- Product, People, Process

- Value Chain
- Supply Chain
- Product Life-cycle
- User Scenarios

- Focus, De-focus

Different representations...



...in different situations.

How to start

Develop the skill to identify factors.

Apply these heuristics

- Problem, Solution
- Producer, Market, Consumer
- Product, People, Process

Create a diagram.

Thank you

James Bach

<http://satisfice.com/>

Michael Bolton

<http://www.developsense.com/>

Prof. Steve Easterbrook

<http://www.cs.toronto.edu/~sme>





Ruud Cox



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[ruudcox](https://twitter.com/ruudcox)