



POLITECNICO DI TORINO



e-Lite

# Aml Design Process

01QZP - Ambient intelligence

Fulvio Corno

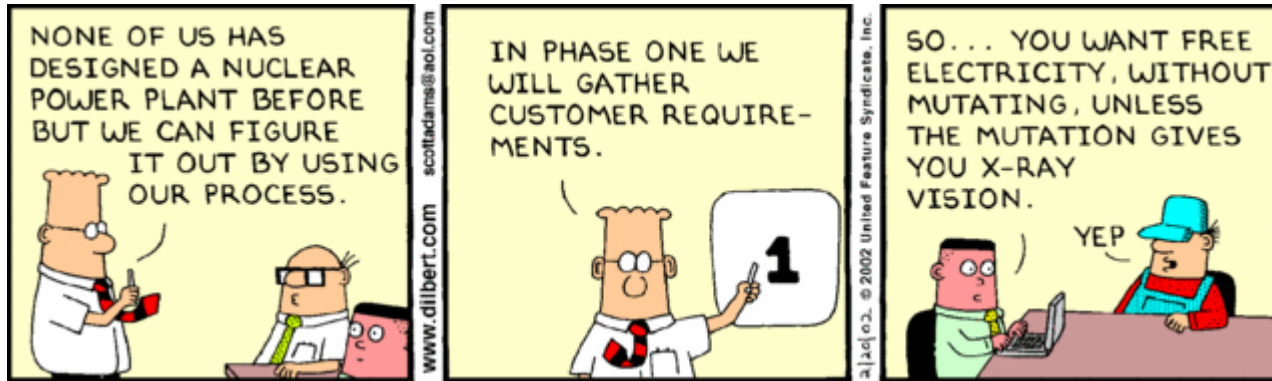
Politecnico di Torino, 2017/2018



Notes on the DESIGN PROCESS  
November 2013, M.HAGAN



# Design Process



<http://dilbert.com/strips/comic/2002-02-20/>



<http://dilbert.com/strips/comic/2001-12-12/>

# Design process (in Engineering)

- The engineering design process is the formulation of a plan to help an engineer build a product with a specified performance goal. [Wikipedia]
- The engineering design process is the formulation of a plan to help **a team of engineers** build a **system** with specified performance **and functionality** goals. [improved]

# Summary

- General design process
- Main steps of the process
  - Step 1: Problem Statement
  - Step 2: Requirements & Features Elicitation
  - Step 3: Requirements & Features Identification
  - Step 4: Architecture Definition
  - Step 5: Component Selection
  - Step 6: Design & Implementation
  - Step 7: Test and Validation
- Simplified process adopted in the Aml course

# Deadline ahead

- Before 18/03
  - Group composition
  - Summary Description
- Do not wait until the last minute
  - May help forming groups
  - We'll monitor in real time
- Discussion: 19/03
- Final deadline: 23/03



## **GROUP NUMBER XX**

### **Team Members**

- Team member 1, email, GitHub username, role in the project
- Team member 2, email, GitHub username, role in the project
- Team member 3, email, GitHub username, role in the project
- [Team member 4, email, GitHub username, role in the project]

**Project Acronym:** XXXYYYYZZZ

### **Project Title**

this is the title

### **Description**

5-10 lines describing the project from the users' point of view. Don't mention technologies nor devices.

[https://docs.google.com/document/d/17qU\\_jNRfiHvDXS\\_H4cfhyw4EFIOTNuRMpW7WHDKaz\\_Gs/edit?usp=sharing](https://docs.google.com/document/d/17qU_jNRfiHvDXS_H4cfhyw4EFIOTNuRMpW7WHDKaz_Gs/edit?usp=sharing)

Aml Design Process

# GENERAL DESIGN PROCESS





# The all-too-common problem



How the customer explained it



How the Project Leader understood it



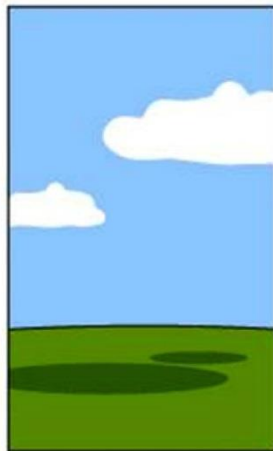
How the Analyst designed it



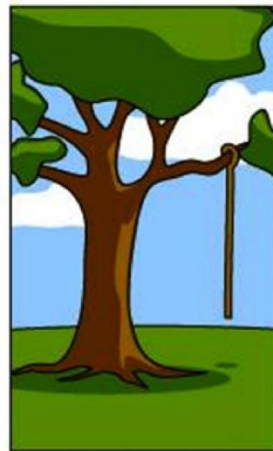
How the Programmer wrote it



How the Business Consultant described it



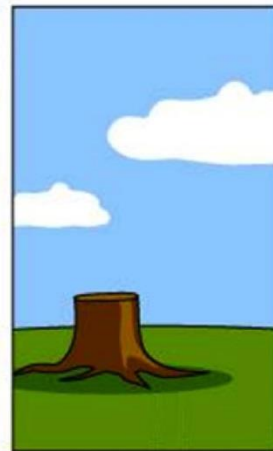
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

# Still more accurate...

## Project Management Crash & Burn 101

Create your own cartoon at [www.projectcartoon.com](http://www.projectcartoon.com)



How the customer explained it



How the project leader understood it



How the analyst designed it



How the programmer wrote it



What the beta testers received



How the business consultant described it



How the project was documented



What operations installed



How the customer was billed



How it was supported



What marketing advertised



When it was delivered



What the customer really needed



What the digg effect can do to your site



The disaster recover plan



What the customer really needed



What the digg effect can do to your site



The disaster recover plan

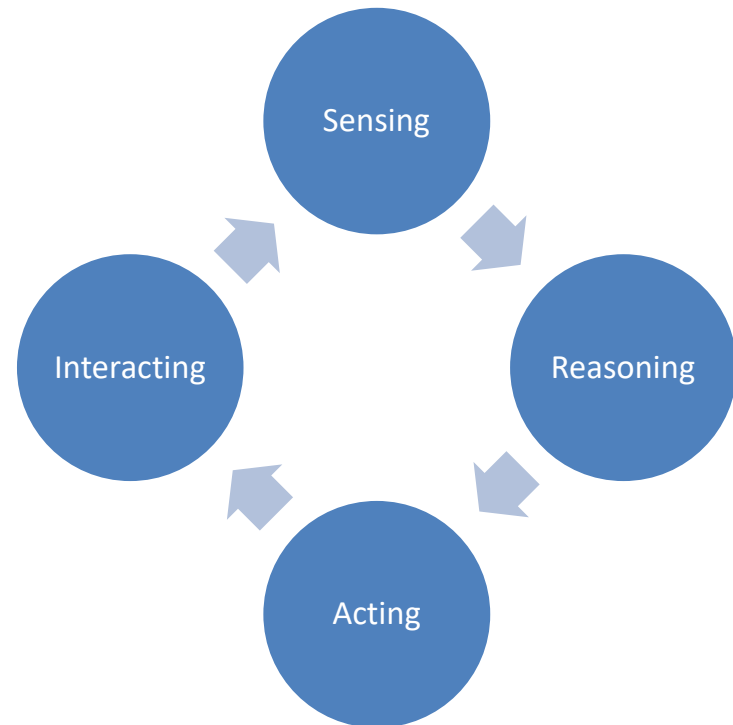


# Goals

- To select **one** possible approach, among the many ones proposed, to design and realize an Aml system
- To analyze and formalize **one** possible flow of activities
- To understand the activity and the output of the main **steps**
- To define a scaled-down version compatible with the time constraints we have in the Aml course

# What we want to achieve

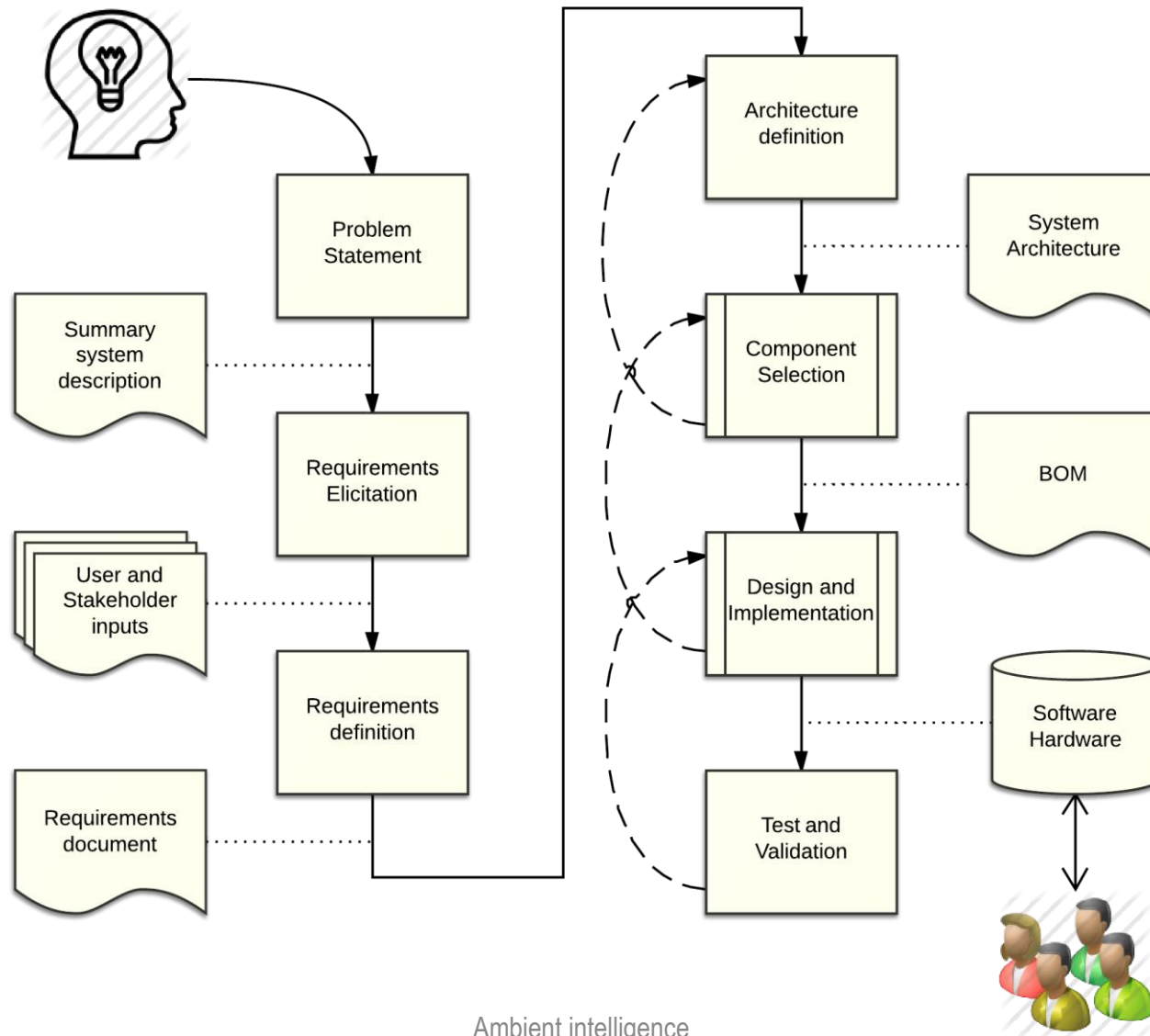
- From initial idea...
- ...to working Aml system



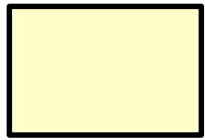
# Assumptions

- The approach should be **technology-neutral**, i.e., the best fitting technologies will be selected **during** the process, and will **not** be defined **a-priori**
- When existing solutions/devices are **available and suitable** for the goal, aim at **integrating** them. When **no** suitable existing solution exists, consider developing/prototyping some **ad-hoc** device(s)

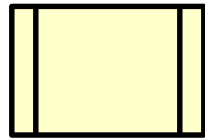
# Proposed process



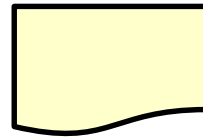
# Legend



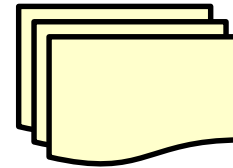
Activity



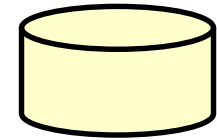
Complex activity



Document

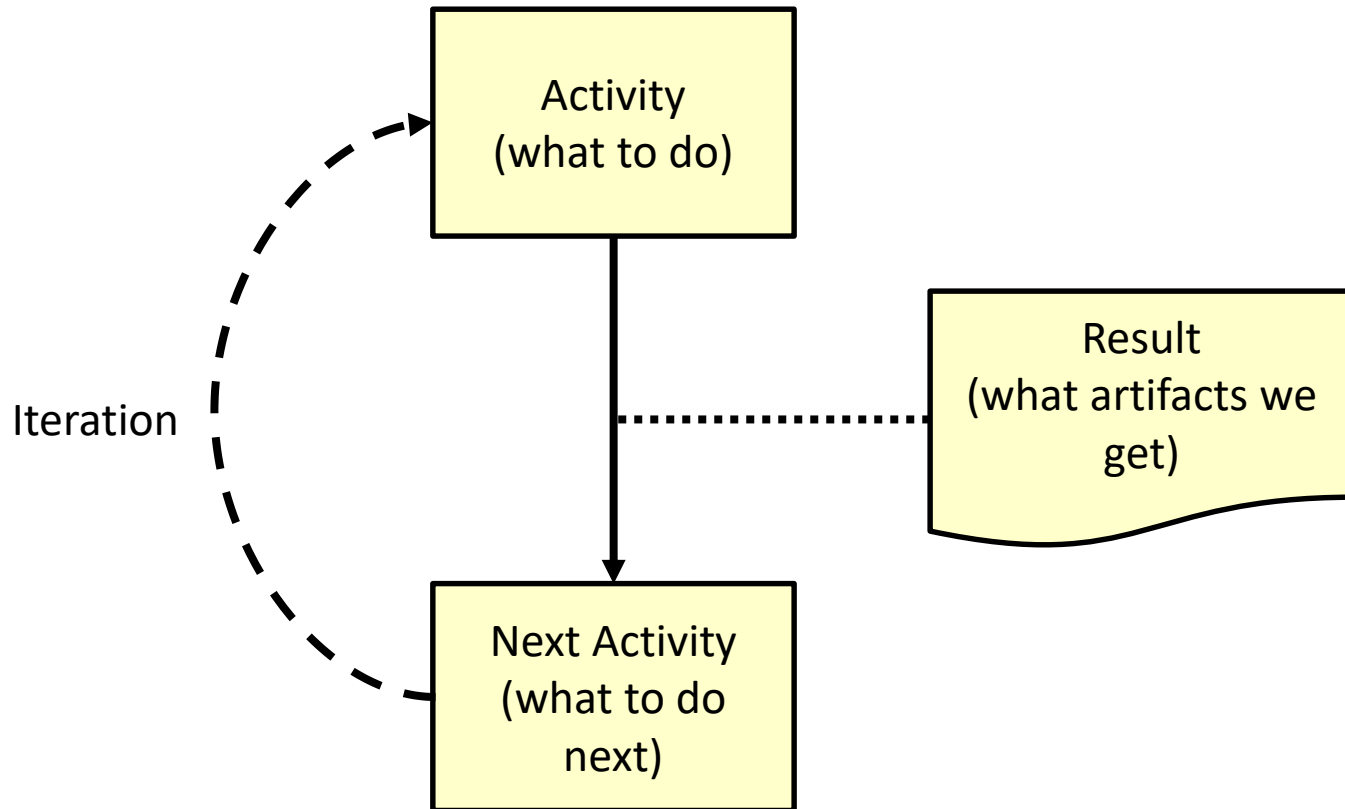


Documents



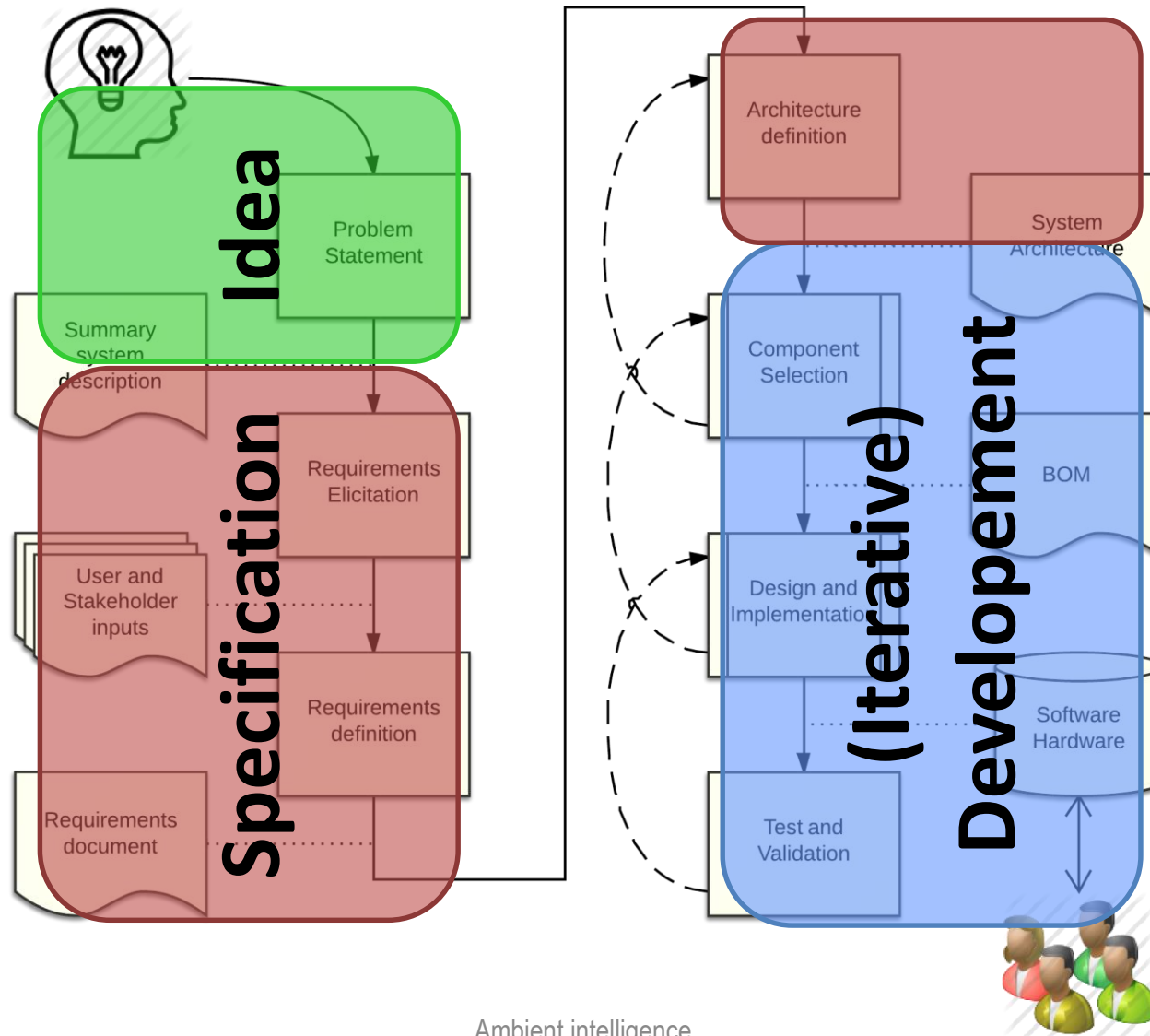
Tools

# Composition of each step

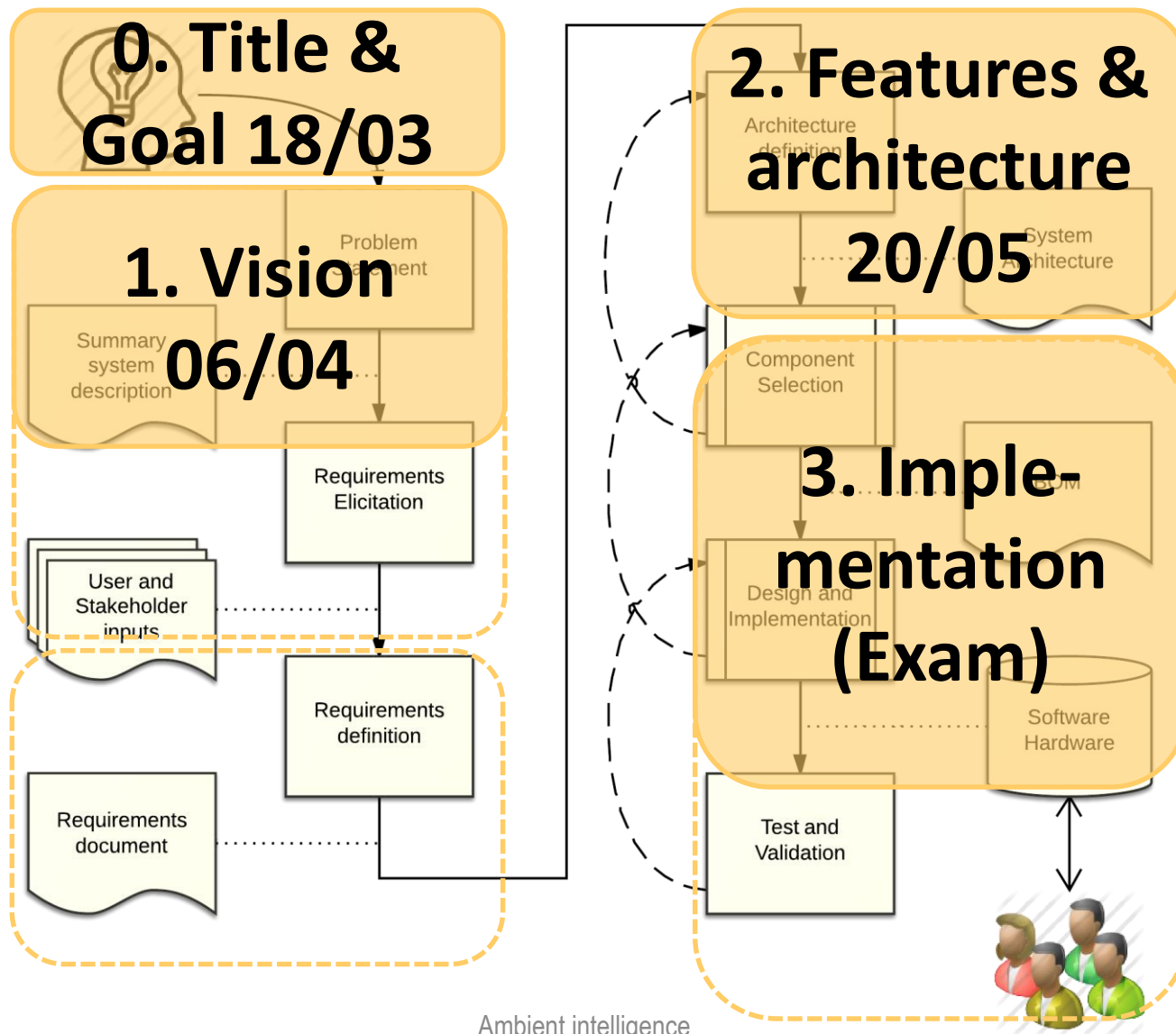


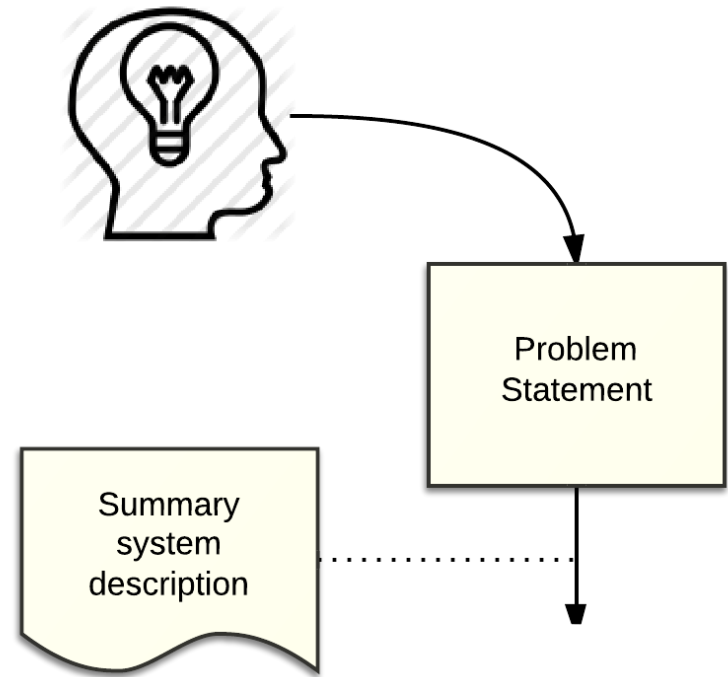


# Proposed process



# Simplified process & Deadlines



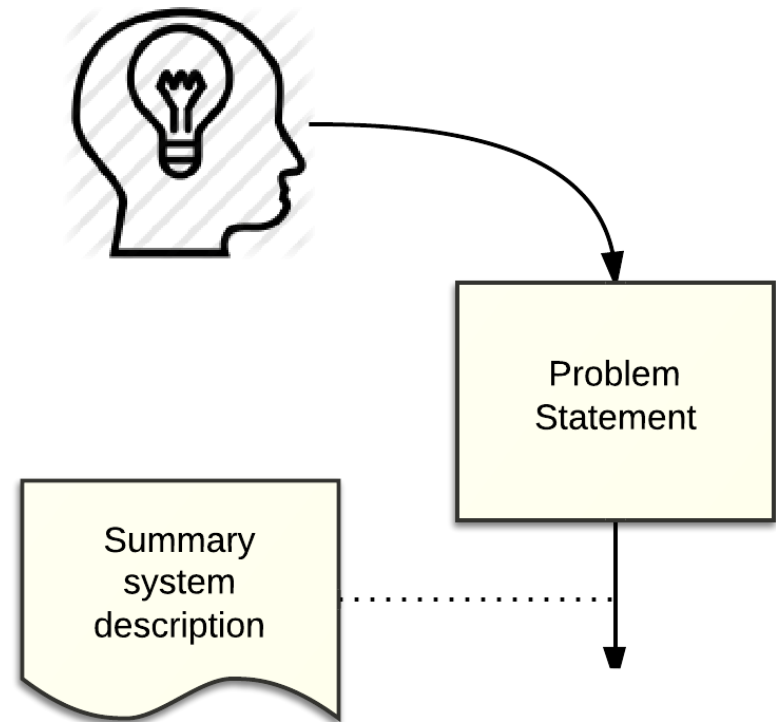


Aml Design Process

# STEP 1: PROBLEM STATEMENT

# Problem Statement

- Define what **problems** need to be solved/tackled
- Identify the **benefits**
  - For the users
  - For the environment
- Create a **brief summary of what the system does for the users**



# Summary System Description

- ½ page – 1 page max of “vision”
- Absolutely **avoid** describing the **technology** or making some technical choices
- Define the target environment
- Define your **users**
- Describe **how** the environment supports the users, from the user point of view
- Try to **hint** at Aml features (Sensitive, Responsive, Adaptive, Transparent, Ubiquitous, Intelligent)
- Imagine “selling” it to a non-engineer (find someone to read it)

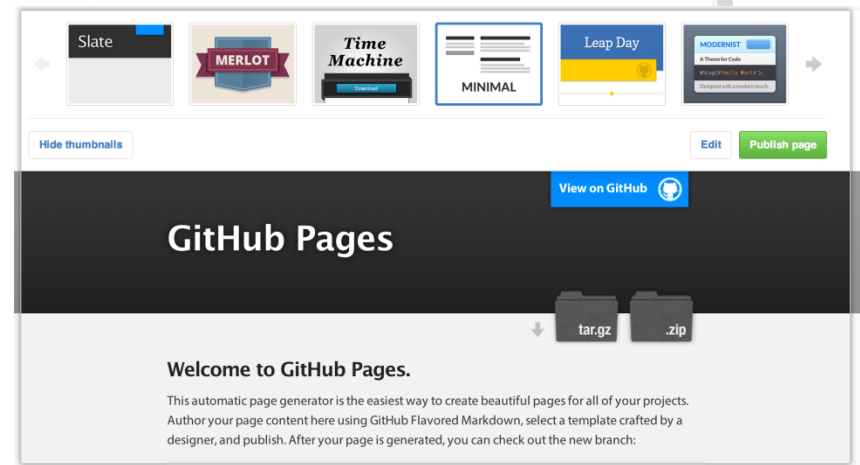
# Tips

- No technology
  - But we must know it's feasible, somehow
- Start simple
  - Few features, few users
  - But full Aml features
- Pitch it
  - Why users should be happy to use it
  - Tell a story...
- Google it
  - Search for similar ideas / products / articles
- Involve users
  - Describe, discuss, ask, **LISTEN**
  - Users know better (except when they don't)



# Deliverable 1

- Before 06/04
- Set-up project web site
- Develop your «Vision»
- Integrate the «Vision» on the website
  - In the website content, not as a separate document
- You'll receive feedback on 09/04 (in LADISPE)



# Vision: «WakeKill»



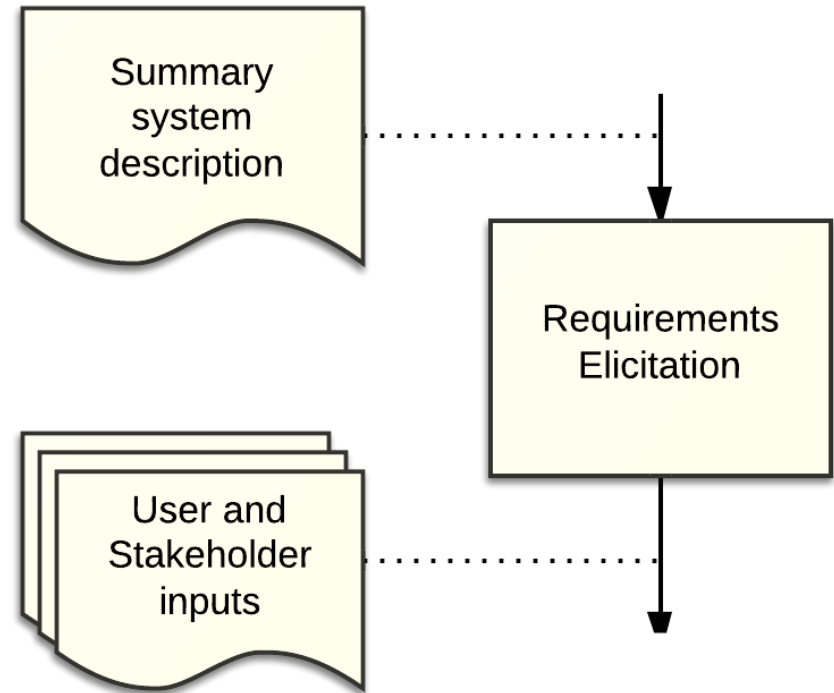
- Each user requires their own personalized wake-up experience. Users will never miss a wake-up call, every morning will be a pleasing experience and they will never be late. Your house, your devices, your calendars, will team up to personalize the optimum wake-up call, personalized to you, and personalized to your day's schedule, location, and mood.
- The system will exploit different means to wake up users in the morning. It will combine ringing, turning on the lights, the radio, and other methods, according to the available devices and to user preferences. It will automatically adjust time according to the user's agenda. When the user is not at home (e.g., hotel) it avoids activating at-home devices, and only users user devices. It will detect when the user actually wakes up (or is already up).

# WakeKill



I absolutely love the  
user experience  
that WakeKill gives  
me



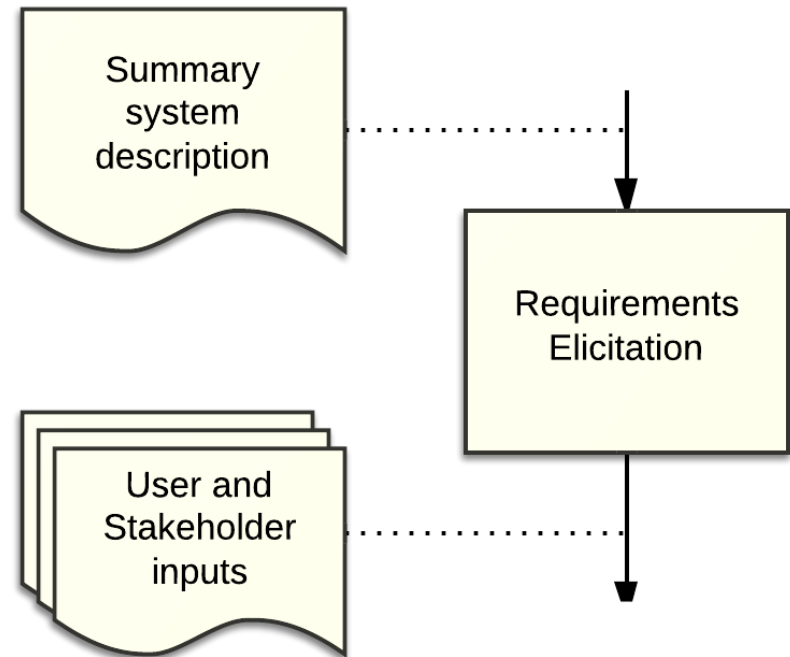


Aml Design Process

# STEP 2: REQUIREMENTS ELICITATION

# Elicitation

- Consider the needs and the opinions of
  - Users of the system
  - Stakeholders for the system
- Collect and evaluate carefully and objectively
- If needed, adapt your vision



# Elicitation

- Consider the opportunities for elicitation
  - User requirements
  - Stakeholder requirements
- Collect requirements carefully
- If needed, create a vision

Due to time restrictions, this step is **not formally required** in the Aml course.

In the course, just try to get as many user inputs as possible, even in an informal and unstructured way, and consider them in building your vision.

It is, however, **essential** for successful ICT products.

Requirements  
Elicitation



# Roles

## Users

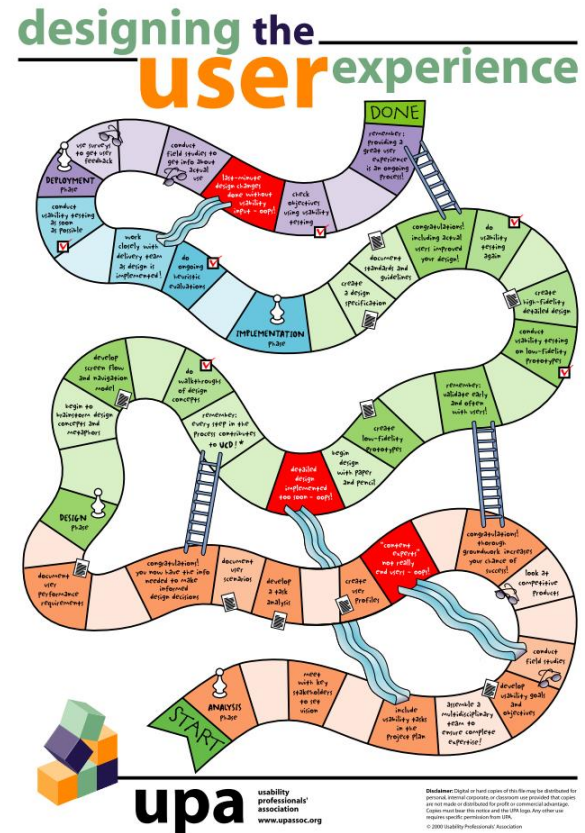
- Persons that will be the final targets of the system and will interact with the system
- Or, at least, persons with similar characteristics to the actual final targets
- Don't need to understand how the system works
- Need to understand how they will interact

## Stakeholders

- Persons (or institutions) that will have an interest in the success of the system
- May not be users
- “Interest” may be economic, better efficiency, user satisfaction, higher control or security, better understanding, ...
- May be involved in funding the system

# Users know better

- Serving users should be the cornerstone of Aml
- “User Centered Design” (UCD) is a methodology that includes a set of techniques for involving users throughout the design process

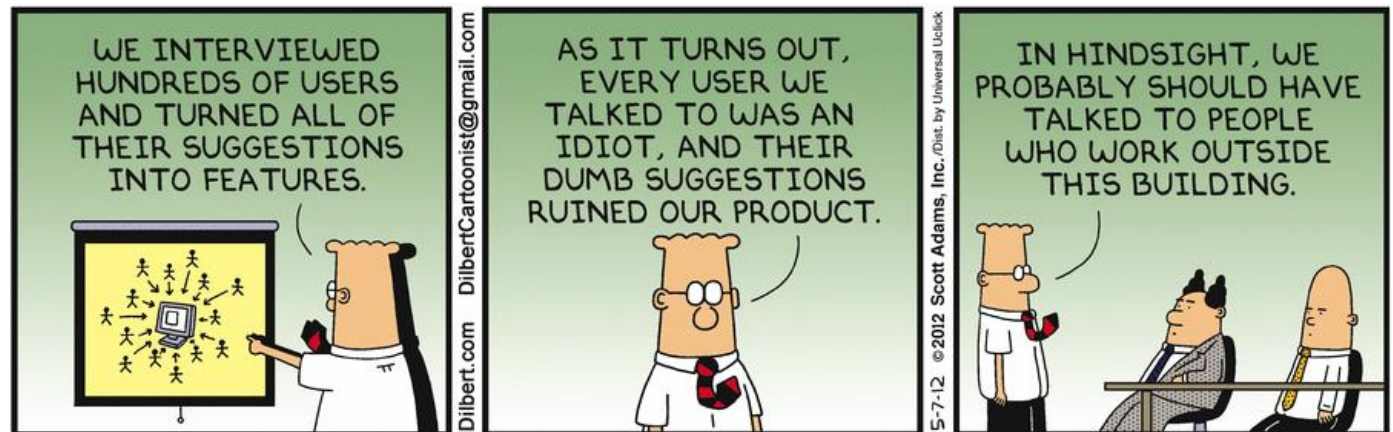


[http://www.mprove.de/script/00/upa/\\_media/upaposter\\_85x11.pdf](http://www.mprove.de/script/00/upa/_media/upaposter_85x11.pdf)

# Listening to users...



<http://dilbert.com/strip/2010-01-13>



# UCD requirements

- ISO standard Human-centered design for interactive systems (ISO 9241-210, 2010)
  - The design is based upon an explicit understanding of users, tasks and environments.
  - Users are involved throughout design and development.
  - The design is driven and refined by user-centered evaluation.
  - The process is iterative.
  - The design addresses the whole user experience.
  - The design team includes multidisciplinary skills and perspectives.

# UCD tools and techniques

## Conceptual tools

- Personas
  - a fictional character with all the characteristics of a “typical” user
- Scenario
  - a fictional story about the "daily life of" or a sequence of events with personas as the main character
- Use Case
  - the interaction between an individual and the rest of the world as a series of simple steps for the character to achieve his or her goal

## Design techniques

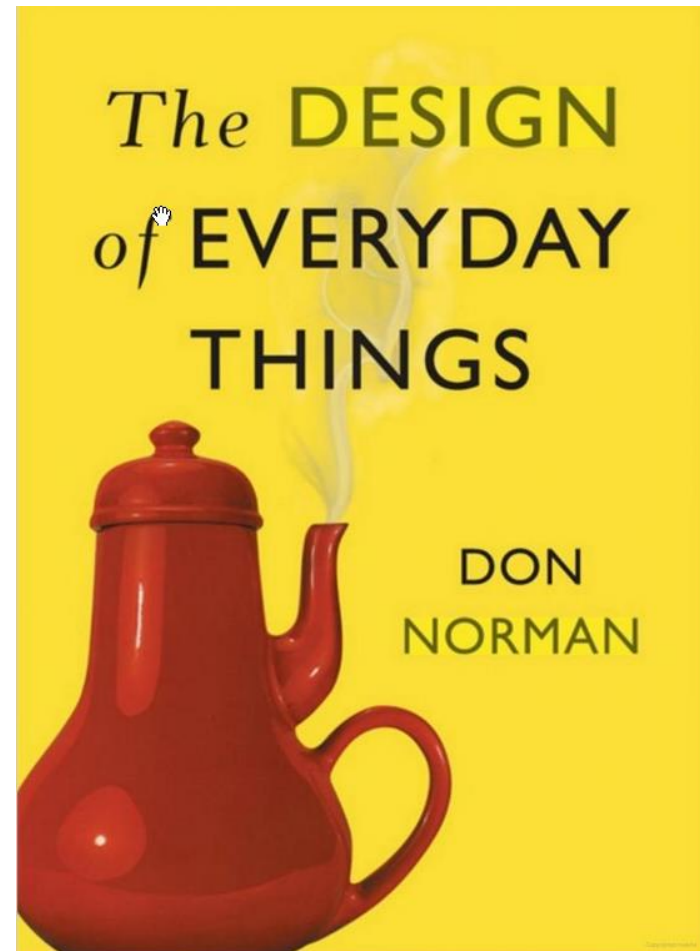
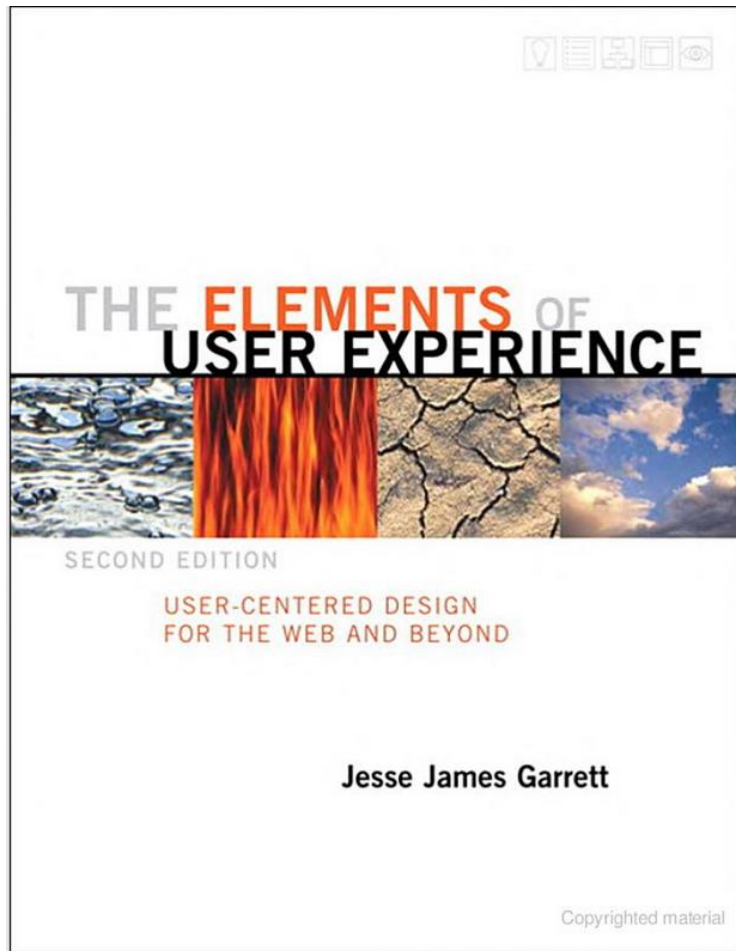
- Field research
- Focus groups
- Interviews
- Design walkthroughs
- Low-fi and Hi-fi prototypes
- Mock-up evaluation
- Usability testing

# Result

- Increased awareness of user perception in your proposed system
- Priority for different system features (some will be abandoned, some will be new)
- Gather design constraints (price, size, aesthetics,
- Mediate user inputs with product strategy
- Transform “a good idea” into “a system that users want”



# Guru References



# Beware...

