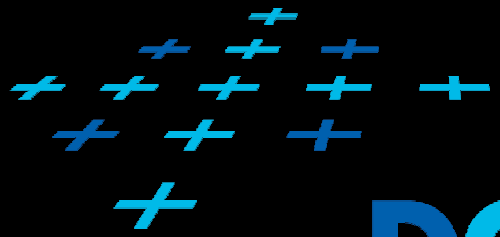


DCGI

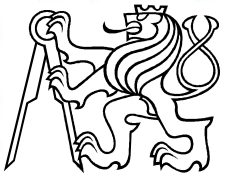
DEPARTMENT OF COMPUTER GRAPHICS AND INTERACTION

NUR - Introduction to HCI

Big picture, design process, UCD, UI issues

Goal of the course

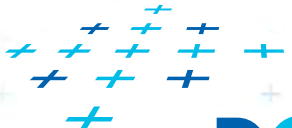
- Theoretical lectures (knowledge)
  - formalisms used for UI design (UI models, user models)
  - principles for UI design (user behavior, formative evaluation, visual design, interaction styles, typography)
  - history of UI design
- Practical lectures (skills)
  - user research, problem description
  - sketching & low/hi-fi prototyping
  - designing in context
- Experts from industry
  - user research
  - prototyping



What it will be good for?

- to predict user behavior
- to predict of future evolution of UI design
- to predict, what will be the next innovation
- to know what time ahead should we think when designing
- to know where to find inspiration for innovations
- to eliminate mistakes very early
- to be able to realy design a product (not to engineere it)

Product development process

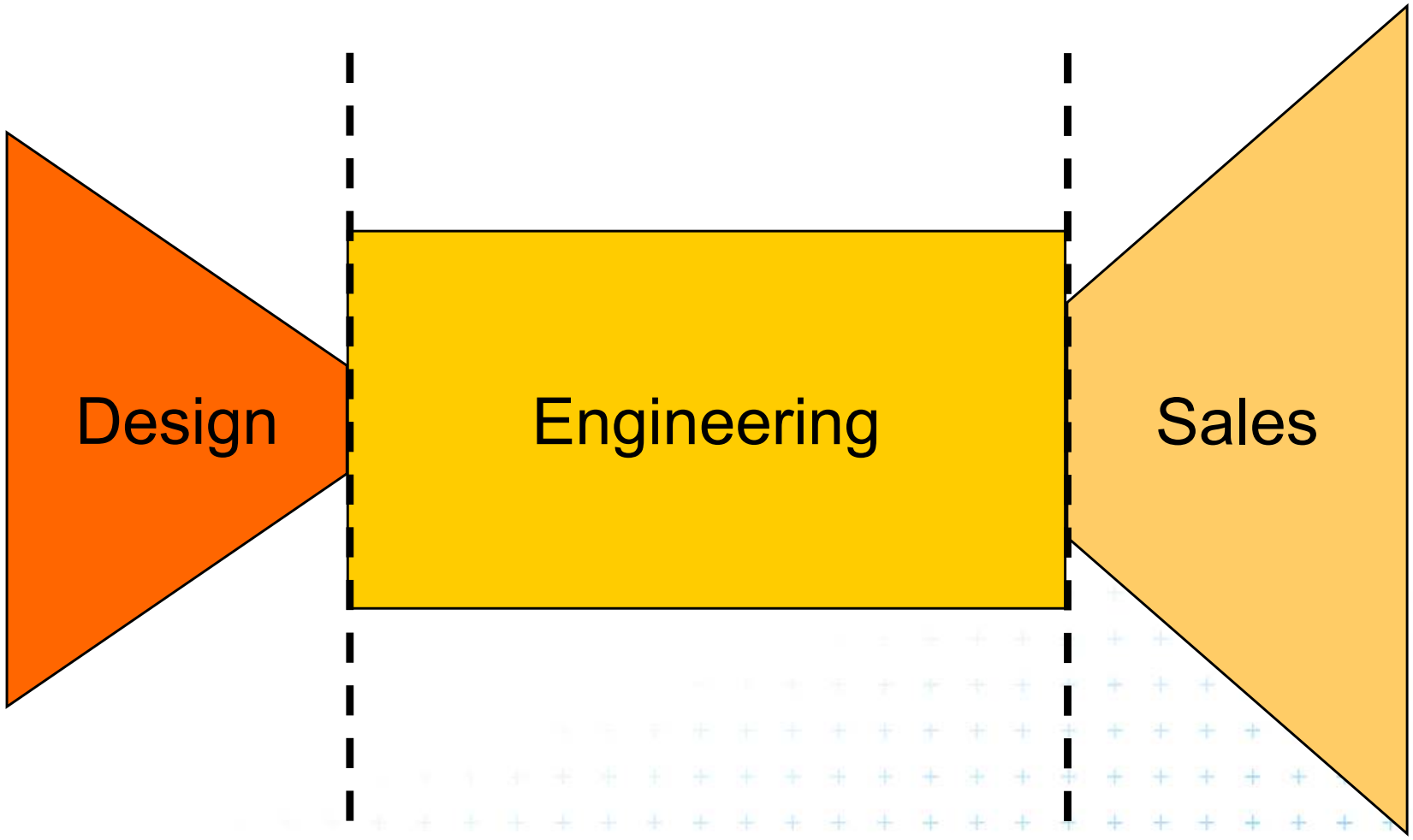


Product development process phases

- Application domain: Personal Weather Forecast

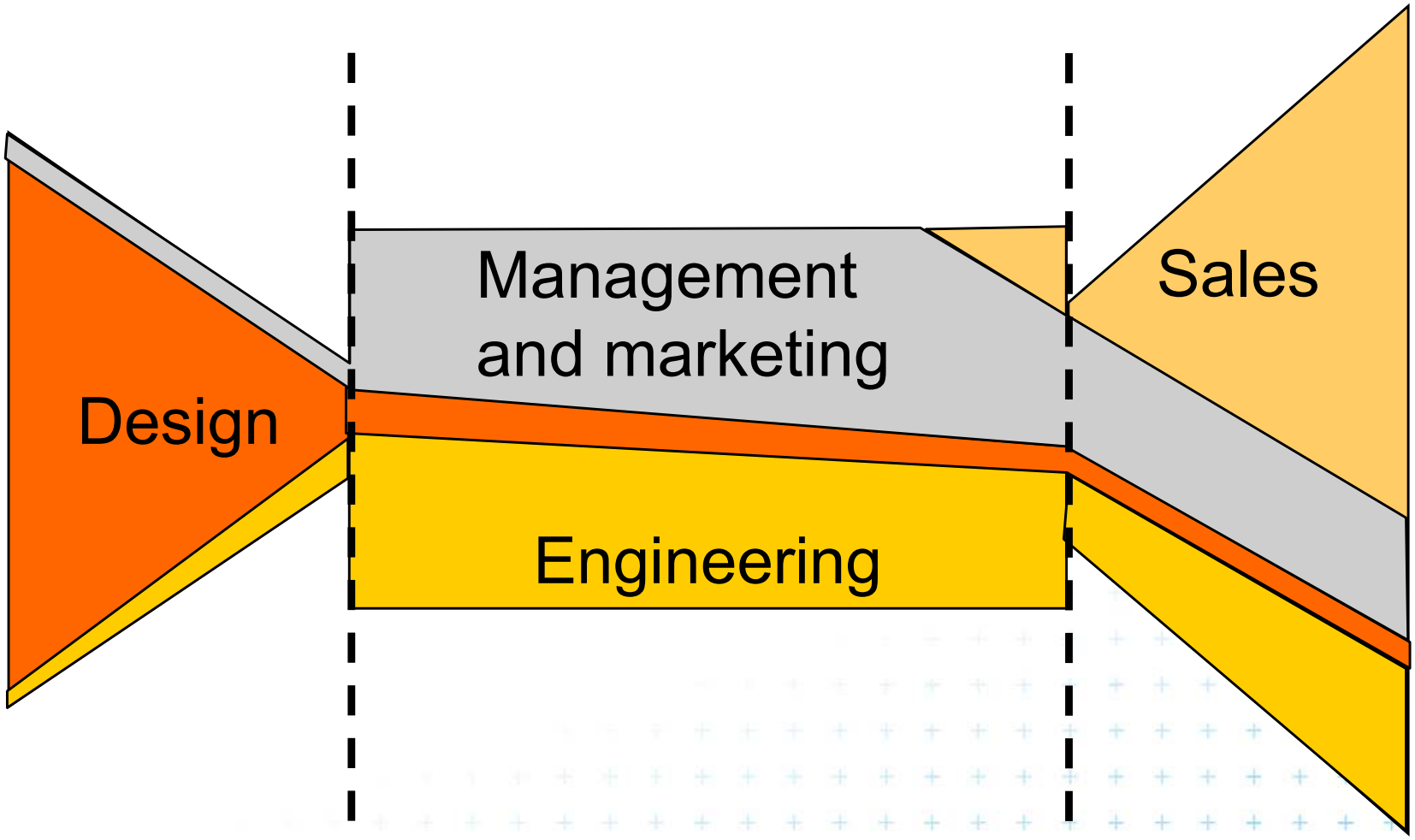
- Development process phases
  - problem analysis
    - user research (ethnography study)
    - user modeling (persona)
  - design
    - sketching
    - prototyping (low-fid, high-fid)
  - engineering
    - programming, manufacturing, assembling
    - testing & evaluation
  - sales

Strictly distinguish design and engineering



Source: Buxton 2007

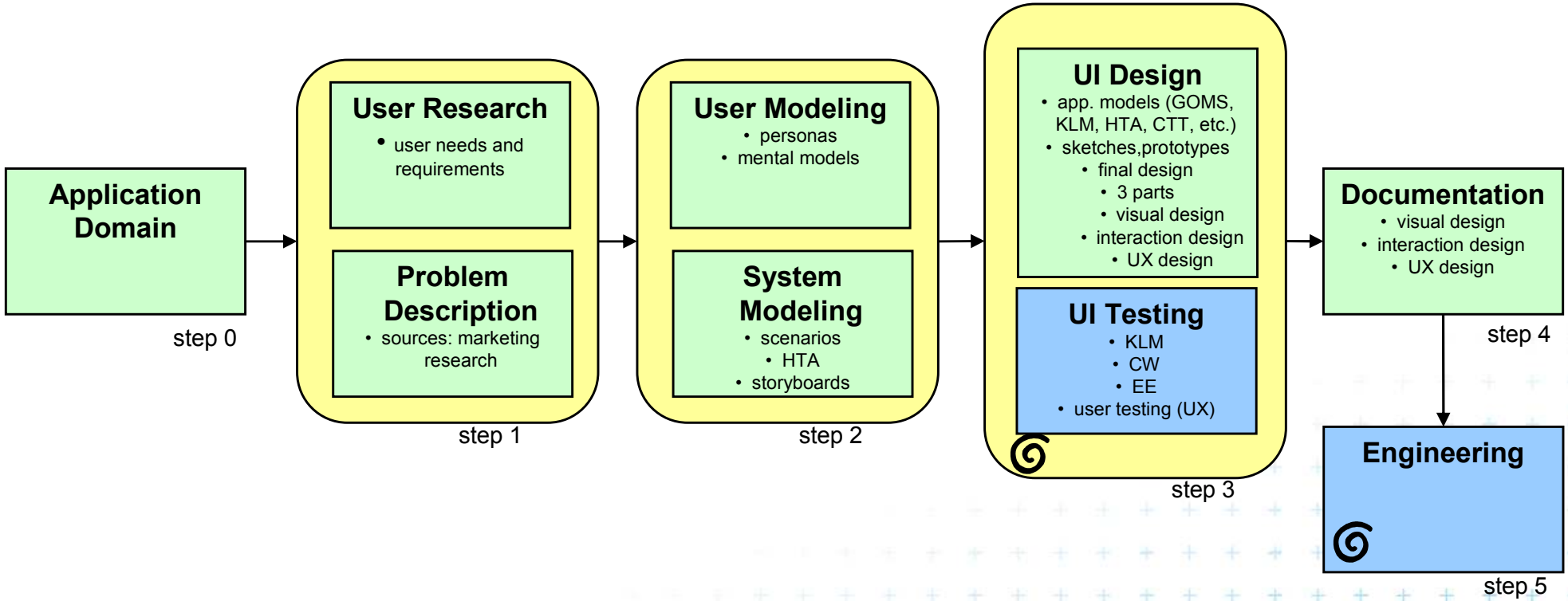
In reality it is a bit more complicated



Source: Buxton 2007

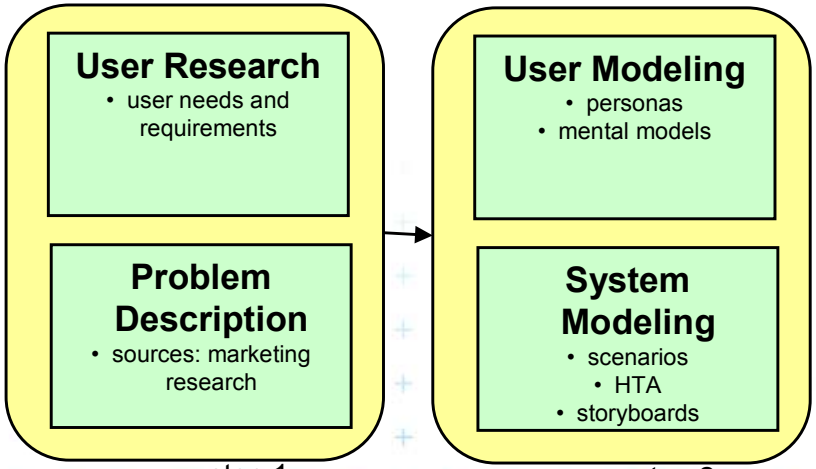
Systematic approach to the UI design

User interface design - big picture



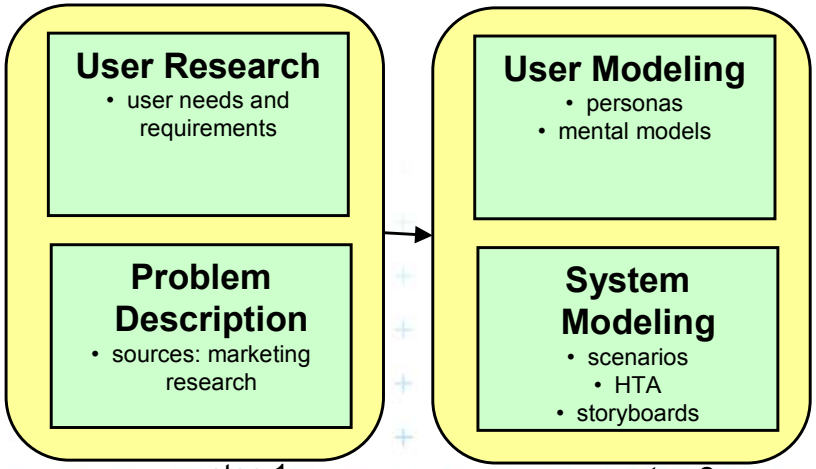
Analysis of the problem to be solved by IS

- Identification of activities
  - which will be supported by IS
- Identification of the users
  - those, who will perform the activities
- Definition the level of support (usability)
  - support the IS will provide
- Selection of the form of solution of the problem



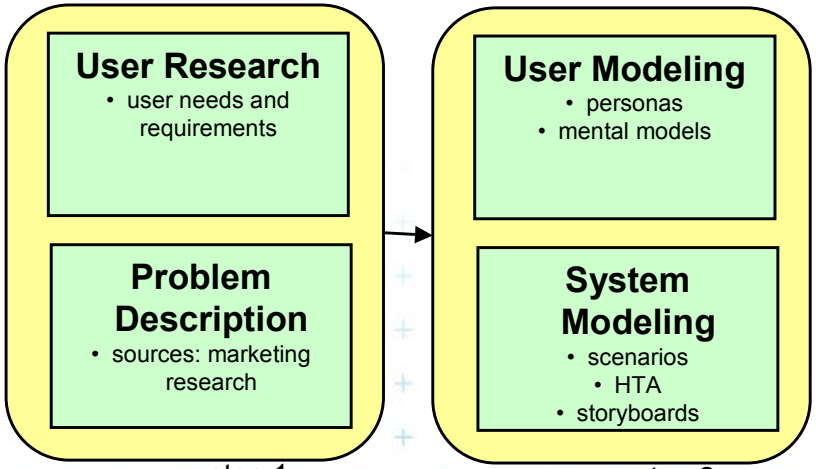
Users

- User requirements
  - general user requirements
    - physical, cognitive, social
  - specific user requirements (related to the problem solved)
- User models
  - KLM, personas



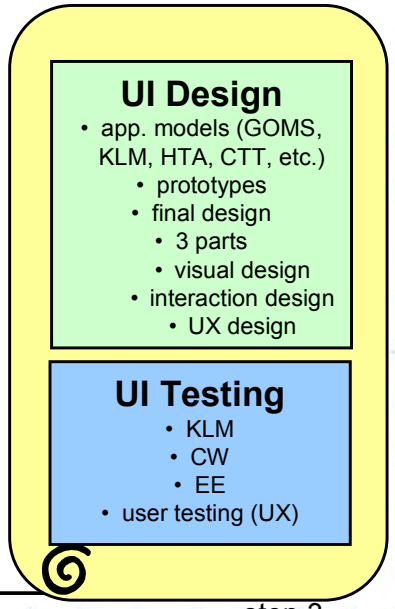
Level of support

- Designed solution must fulfill the user requirements
- Usability - see TUR course



Form of solution

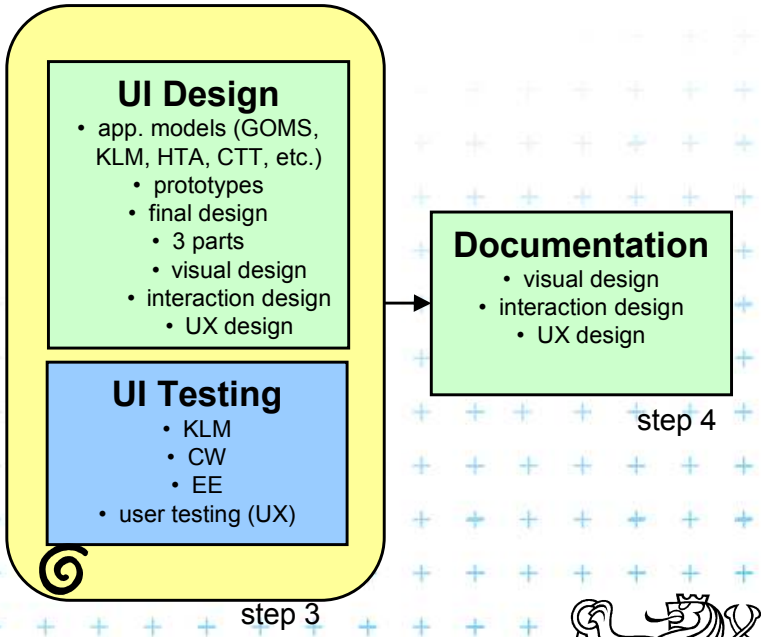
- Influenced by technology, resources and context
  - form of user interface
  - application SW supporting the UI
  - operating system
  - system resources (memory, network bandwidth, etc.)
  - hardware
  - context (e.g., environment)



step 3

IS design process

- 1. Problem description
- 2. UI design
- 3. UI testing
- 4. Documentation for future engineering



Why study HCI?

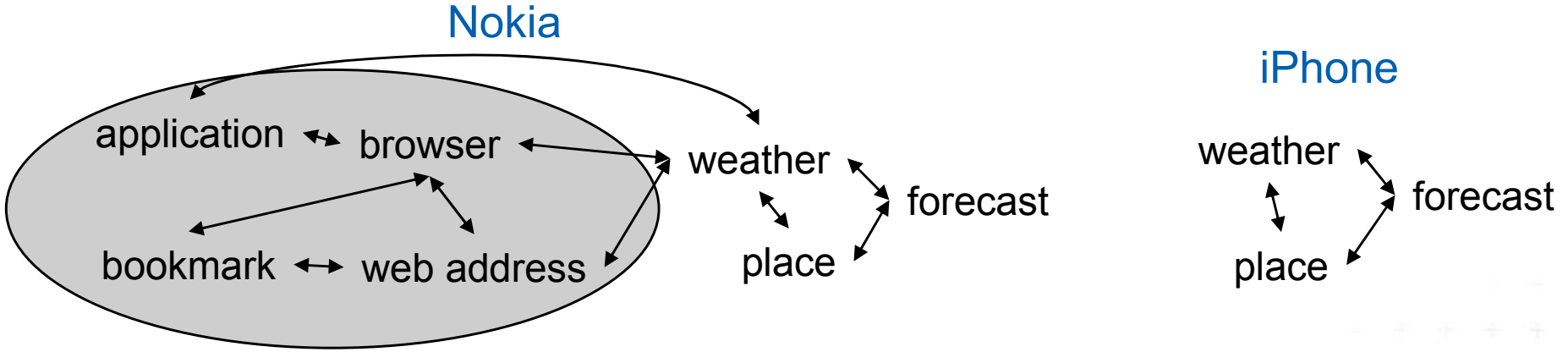
- You will be designing real applications
  - they will be used by other persons
- UI represents the majority of the IS code
  - over 50% (some authors speak about 80%)
  - more than 50% of implementation effort is UI!
- Costs related to bad UI design
  - financial (commercial success of IS is strongly dependent on UI quality)
  - life (airline crashes, explosions in the factory)
- Successful UI design requires
  - knowledge of the human capabilities and general requirements
  - knowledge of the UI design principles and lifecycle

Weather forecast - Nokia

Weather forecast - iPhone

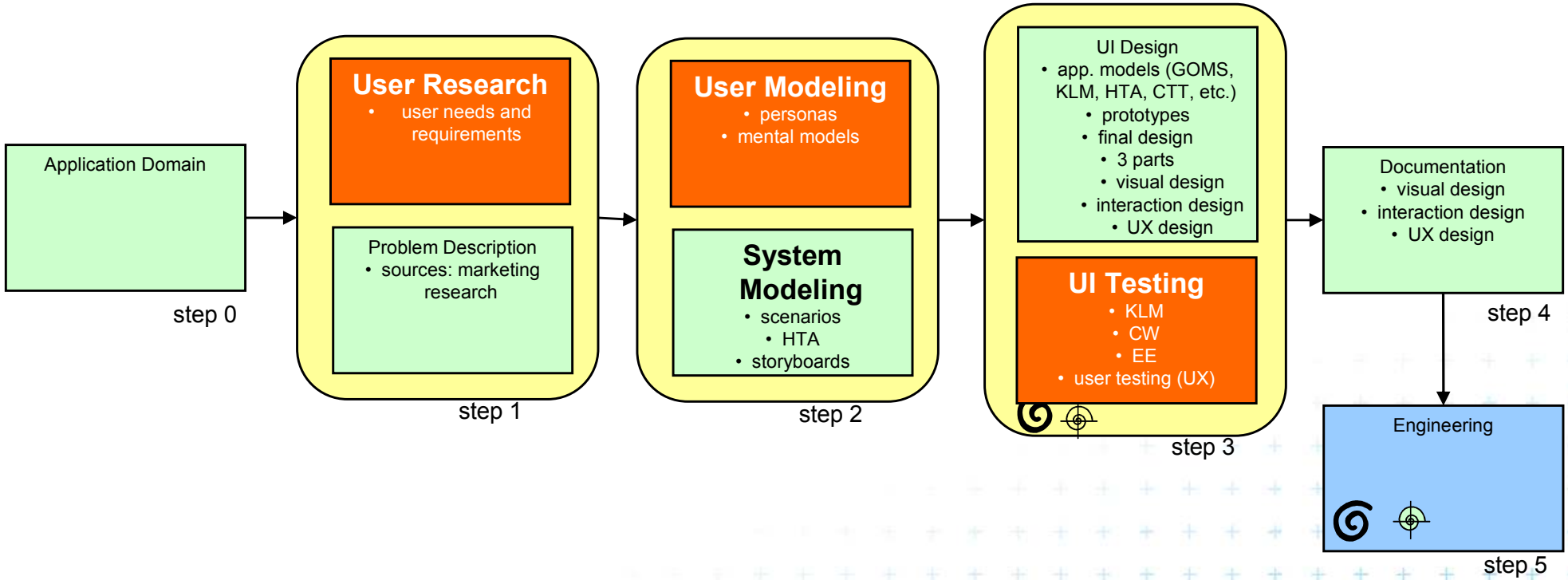
Weather forecast: What is the main difference?

- Number of "clicks"?
  - NOT necessarily
- User's mental model?



- Is there anything wrong?
  - complexity of mental model - NO
  - unknown terms and relations (coming from system mental model)
    - What is the weather in Prague for tomorrow?
- What are the consequences?

What was underestimated in the design process?



What kind of users do we have in mind?

- People are different
- The particular design is always a compromise
  - we do not consider rare extremes (illiterate user)
- Usually 5% “outlier” cases are eliminated
  - the result of this strategy is that some potential users can be discriminated
- Examples
  - car: height, weight
  - computer: font size, use of colors (colorblinds)...

Classes of users

- Novices
  - very limited set of functions available
- Casual users
  - standard set of functions
- Advanced users
  - advanced functionality
- Experts
  - sophisticated functionality

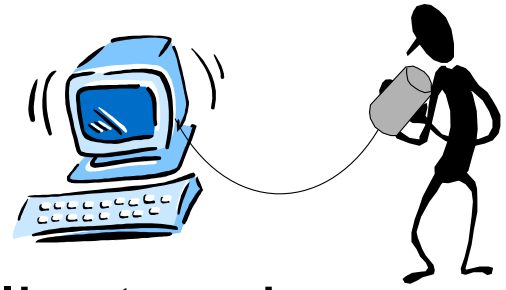
- Consequence: necessity to split functions into individual categories
- How can influence particular class of users implementation of functions?

Introduction into HCI

Basic terms

Human-Computer Interaction (HCI)

- Human
  - End-user of an application
  - Collaborative environment
- Computer
  - The device running the application
  - Execution often distributed among client and server machines
- Interaction – two-way communication
  - User tells the Computer what to do (commands)
  - Computer tells the User what happened (results)



Role of HCI - the bridge

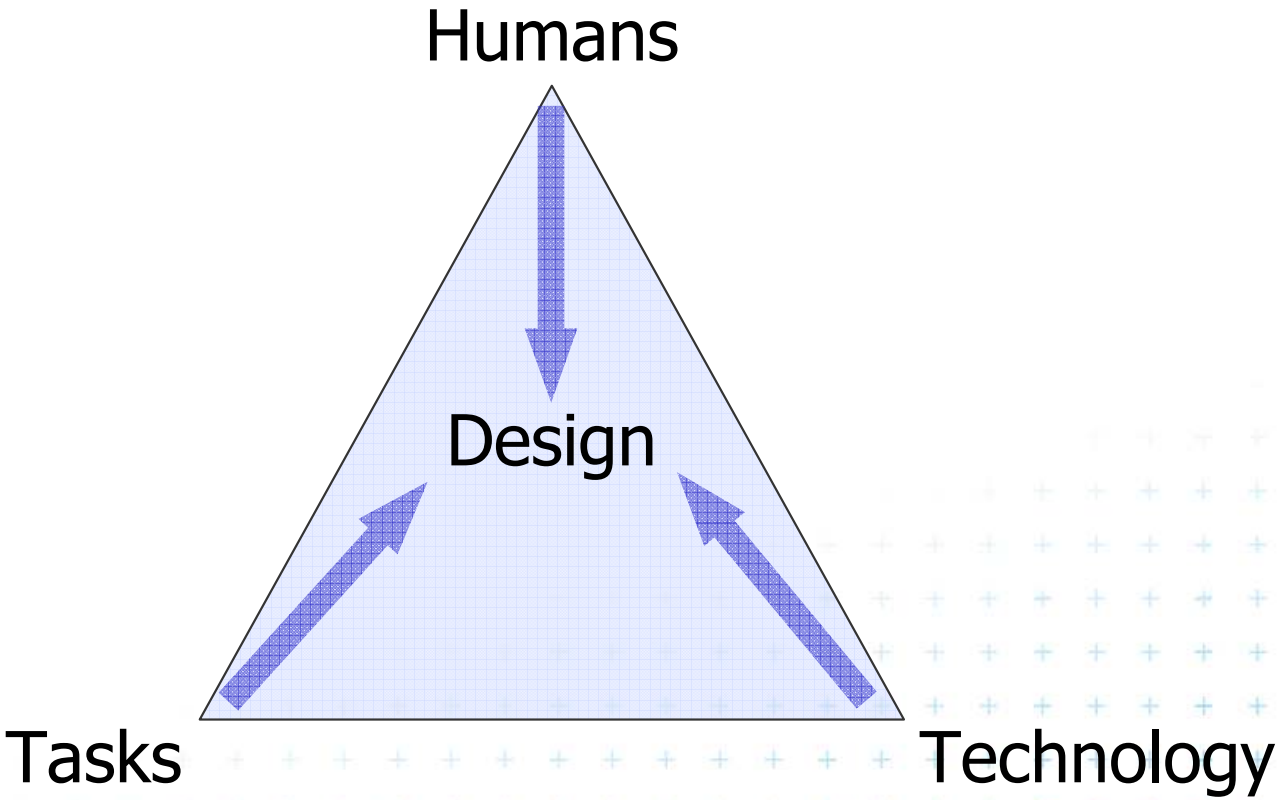
Psychology

Informatics

Human-Computer Interaction

What is HCI?

- Design, Implementation, and Evaluation of the interactive systems from the perspective of use by the human.



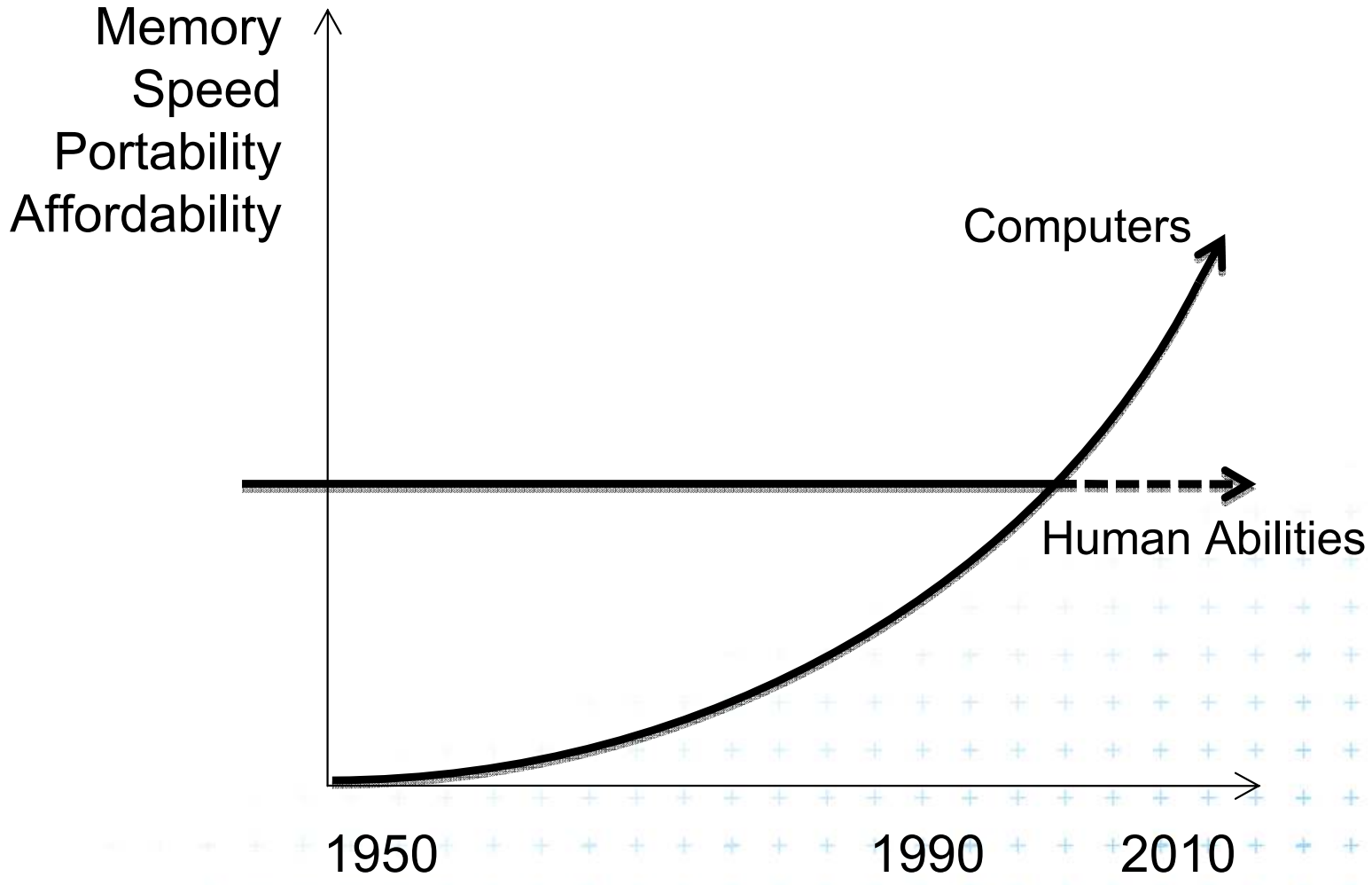
User Interface (UI)

- The part of the technology, allowing people to:
  - Perform their own tasks
  - Interact with the technology
  - Both are indivisible

HCI is sometimes understood as the *design, prototyping, evaluation, and implementation* of the UIs for desktop computers.

Relation between capabilities of a user and capabilities of a computer

Moore's Law


Memory
Speed
Portability
Affordability
Computers
Human Abilities
1950
1990
2010

What are the interactive systems (IS)?

- They support bidirectional communication between human and computer
- What kind of advantages they bring in comparison with batch processing?
  - IS support human activity
    - the results are available much quicker
    - they have higher quality – with few mistakes
  - It is possible to intervene in the course of the problem solution
  - Human can devote his/her capability to creative work
    - the routine work is performed by computer

What we dislike when working with IS?

- We hate to spend our time with remedy of problems that were caused by IS
  - there is not enough time for the work – instead we fight with UI

- That is why we should design high quality UI

Who are the stakeholders?

- Users
- Engineers and designers
- Sales and marketing personnel
- Managers

Resources

- [Buxton 2007] B. Buxton: Sketching User Experiences, Morgan Kaufman, 2007

Thank for your attention