Human-Computer Interaction

BMEVITMMA11

User Centered Design

- Users
- Tasks
- Environment

User Centered Design

- Standard:
  - Arguments for user-centered design
  - Preparations for user-centered design
  - Basic principles of user-centered design
  - Activities of user-centered design

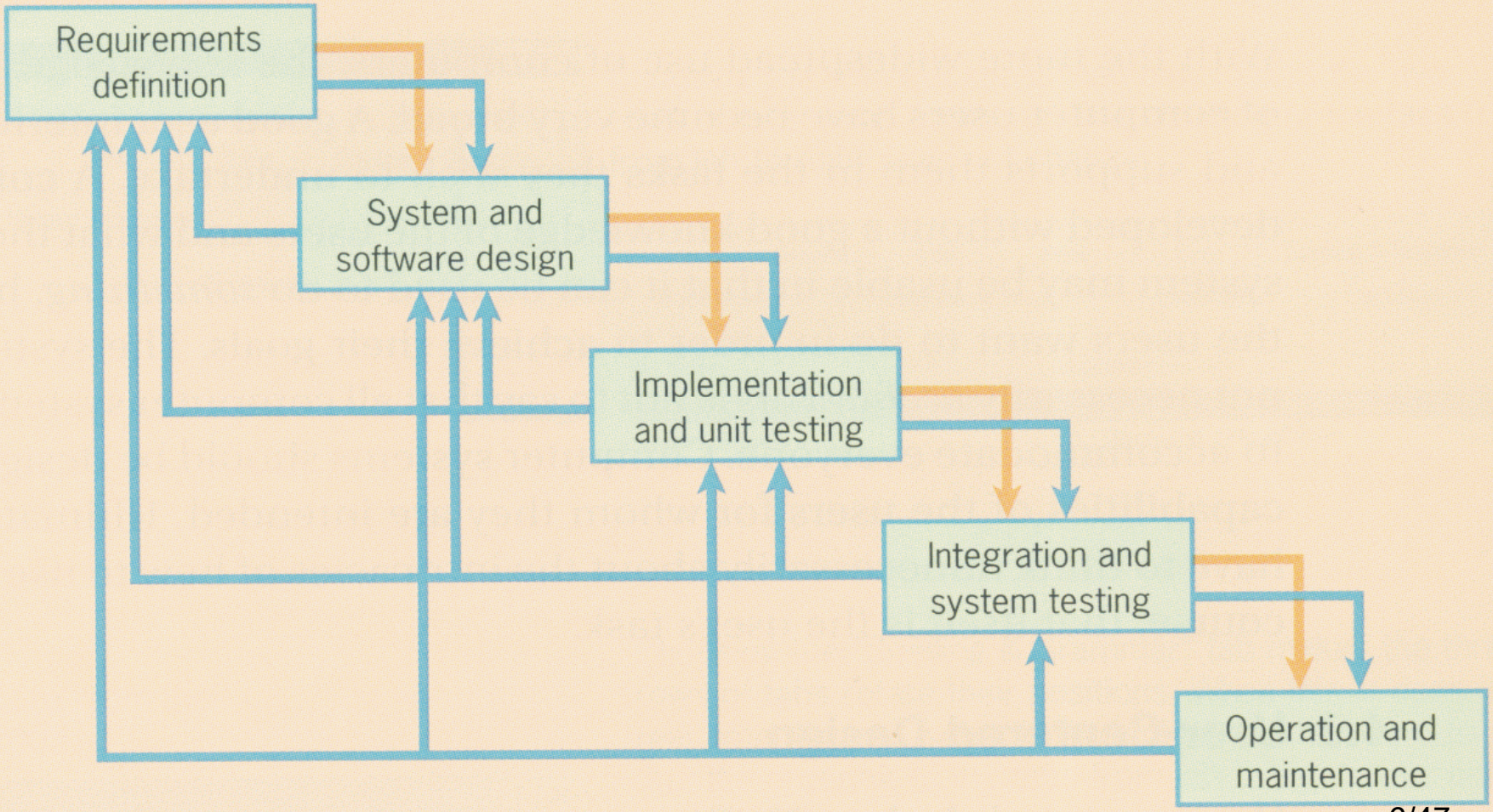
Basic Principles

- Active involvement of users and understanding of user and task related requirements
- Definition and separation of user and technology roles
- Iteration of design solutions
- Multi-disciplinary design

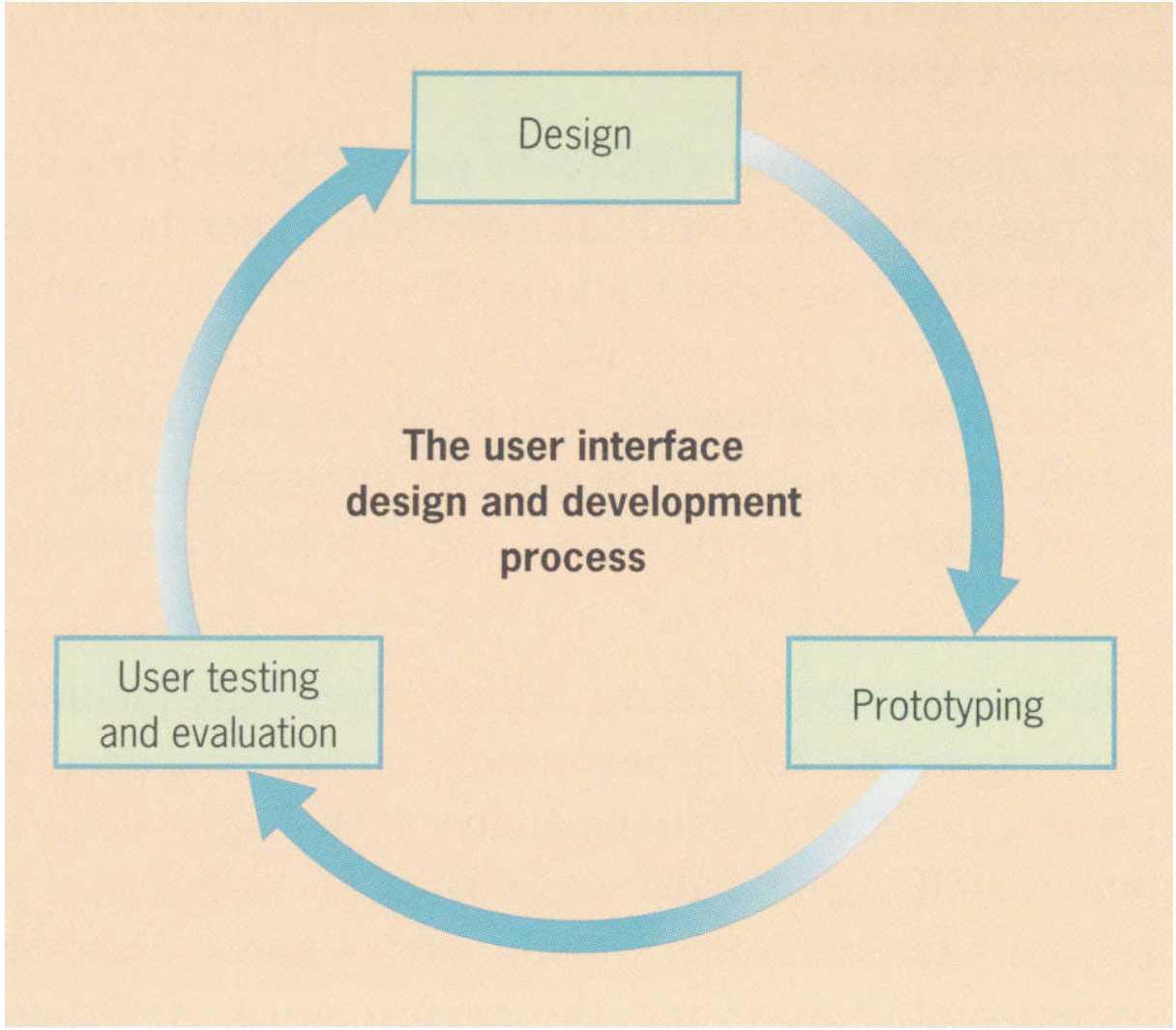
Activities

- Definition and understanding of usage context
- Definition of user and organizational requirements – definition of usability related targets
- Implementation of solutions
- Evaluation of solutions based on requirements

Waterfall model



Iterative


Design
The user interface design and development process
Prototyping
User testing and evaluation

Involvement of users

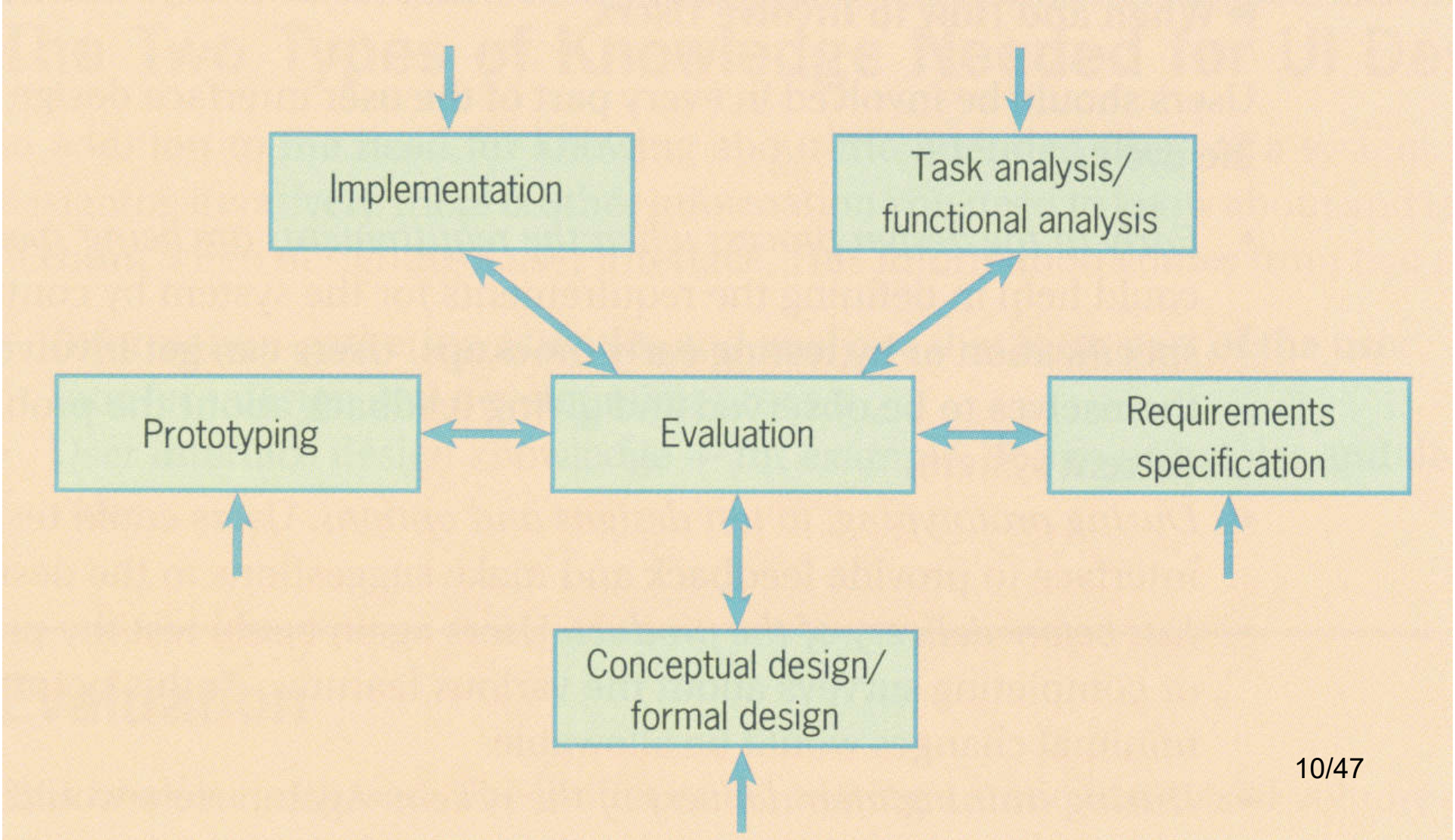
- Observation
- Models
- User involvement

- Testing and evaluation

Who are the users

- Customer
- Users inside an organization
- End-users

Star


Implementation
Task analysis/
functional analysis
Prototyping
Evaluation
Requirements
specification
Conceptual design/
formal design

Development team

- Managers
- Marketing
- Sw engineers
- Programmers
- Graphic artists
- HCI specialists
- Other researchers
- Development workforce
- …

- Users

Information collection

- User observation
  - Original environments
  - Laboratory environment
- Observation effect

Information collection

- Interview
  - Structured
  - Flexible
- Questionnaires
  - Closed questions
  - Scales
  - Open questions

Interview (participation)

- choosing participants
  -target users (representative)
  -current users (similar systems)
  -others (e.g. new system)

- recruiting
  -stakeholders
  -money
  -other motivation

Interview Script (Setup&Intro)

- Setup
  - location (good choice for authentic responses)
  - list of equipment (e.g notebook, smartphone)

- Intro & Participant Background
  - intro script explicitly shares interview goals (why participant is there are what results are sought).

Interview Script (main questions)

- at least 8 questions focused on the project topic
  - questions for specific case (e.g., “tell me about a time...”, “in the last month” rather than “When do you think people...”)
  - all require a ‘real’ response - with opportunities for elaboration - NO “Yes/No”
  - a question asking the participant
    - about their motivations / goals
    - what the participant finds frustrating / enjoyable
    - a specific interesting / unusual example of the participant

Interview (questions)

- Questions
  -not general
  -not yes/no
  -not hypothetical
  -not scale

- Good question
  - open ended question
  - silence (help)

Interview Script (wrap-up)

- In Closing
  - the wrap-up includes an open-ended prompt for dreaming / brainstorming or anything missed
  - thanks for the participant.

Design principles: 7±2

- Memory capacity (English digits)
- Menu structures
- Selection options

2 sec rules

- System should react
- Hour-glass

3 clicks

- If information is not provided user will leave
- May be more, by certain conditions
  - Where
  - From where
  - Where to

Pareto principle

- 20 % -> 80 %
  - for many events, roughly 80% of the effects come from 20% of the causes
- Define
- Implement

Golden rules

1. Strive for consistency
2. Shortcuts
3. Informative feedback.
4. Design dialog to yield closure

Golden rules II.

5. Simple error handling
6. Undo
7. Sense of control for the user
8. Reduce short-term memory load

Fitts' law (1954)

$$T = a + b \log_2 \left(1 + \frac{D}{W} \right)$$

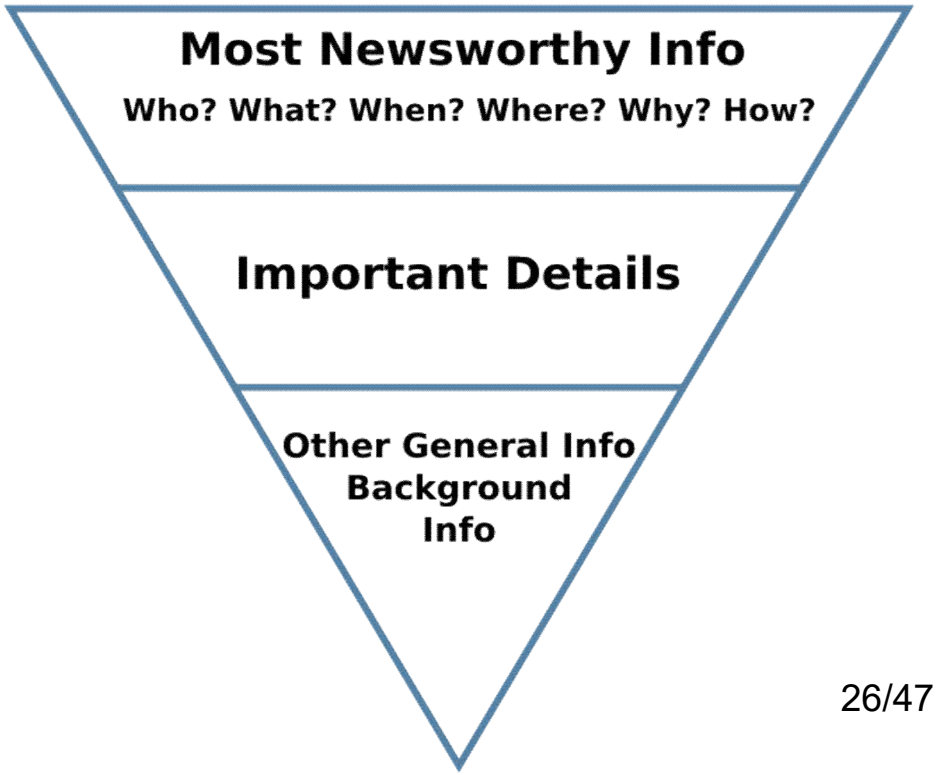
- Take into account during design

- Extended to Accot-Zhai steering law (1997)

$$T = a + b \int_C \frac{ds}{W(s)}$$

Inverted Pyramid

- Originally writing style
- Conclusion in the front
- Others later



Quick’n’dirty-solutions

- Just sufficient
- Will not search for the best available

Graceful degradation

- If something is not available
- Reduced mode to be usable

Walk-Up-And-Use Design

- Serving first time users
- Will return after the first failure?

Cliffhanger-Effect (Zeigarnik-Effect)

- Uncertainty is not preferred
- Advertisers exploit

Adress a wide audience

- Different user abilities
- Different needs

Information amount handling

- Cognitive load
- Filling forms

Colours

- The content should remain meaningful even without colours
- Colour-blindness (www.vischeck.com)


ORSZÁGOS METEOROLÓGIAI SZOLGÁLAT
2009. október 13. 12:45 (10:45 UTC)
Radar térkép (Magyarország)
-Csoportok-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Speech and audio

- Equal alternative
  - Error signal – noisy environment

Clear language

- Adequate wording
- Polite
- Multi-layer communication

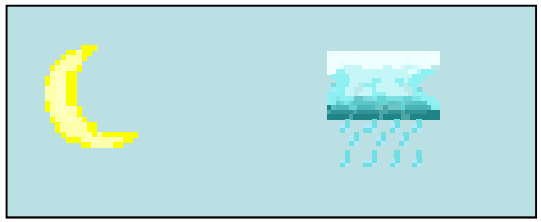
Structure

- Correct usage of structure
- Same structure for the same tasks

Tables

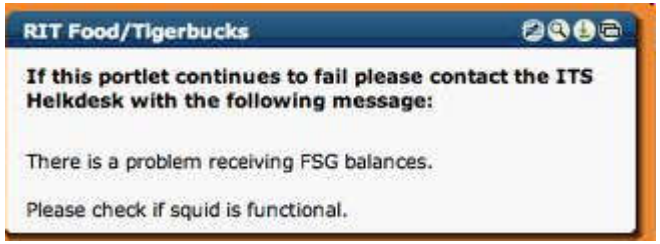
Time-varying elements

- Allow user to stop it
- Increases cognitive load
- Distracts attention
- May be informative



Error handling

- Undo
- Meaningful error messages



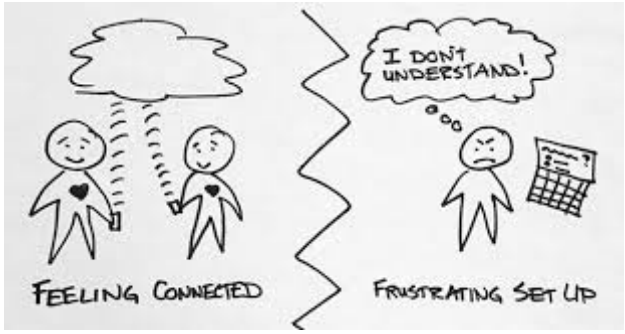
Task

- You've learned about
  - interviewing and definition of user needs,
- Implement an experiment
  - What are the goals, problems, and contexts of the people who might use your design?
  - How might their goals and opinions motivate you to create new applications, and services?

Storyboard

- Storyboard
  - communicate ideas about functions NOT UI
  - no need for nice drawings
  - you can use „stick” or „star” people

  Not more than 10 minutes for a storyboard



Storyboard

- Basic situation:
  - which people participate
  - what is the environment
  - which problem to solve

- Process:
  - important steps (no need for UI)
  - why would anyone use it
  - how would it be used for solving a problem

Interview steps

1. Create an interview script.
   – Topic: team's own project (4 parts: Setup, Intro & Participant Background, Main Interview Questions, Concluding)

2. Find participants, and interview them using your script.