Interaction design

Univerzitet u Kragujevcu
Prirodno-matematički fakultet
Institutat za matematiku i informatiku

Interaction design

How to specifically design the behavior of complex interactive system?

What drives design of interaction? -> USER

You must know your users

- Who are users
- Needs
- Goals
- Cognitive, behavioral, anthropomorphic, and attitudinal characteristics
- Contexts

You should be aware of human behavior drivers

- Cognitive aspects
- Social aspects
- Emotional aspects

User-centered design

Watch

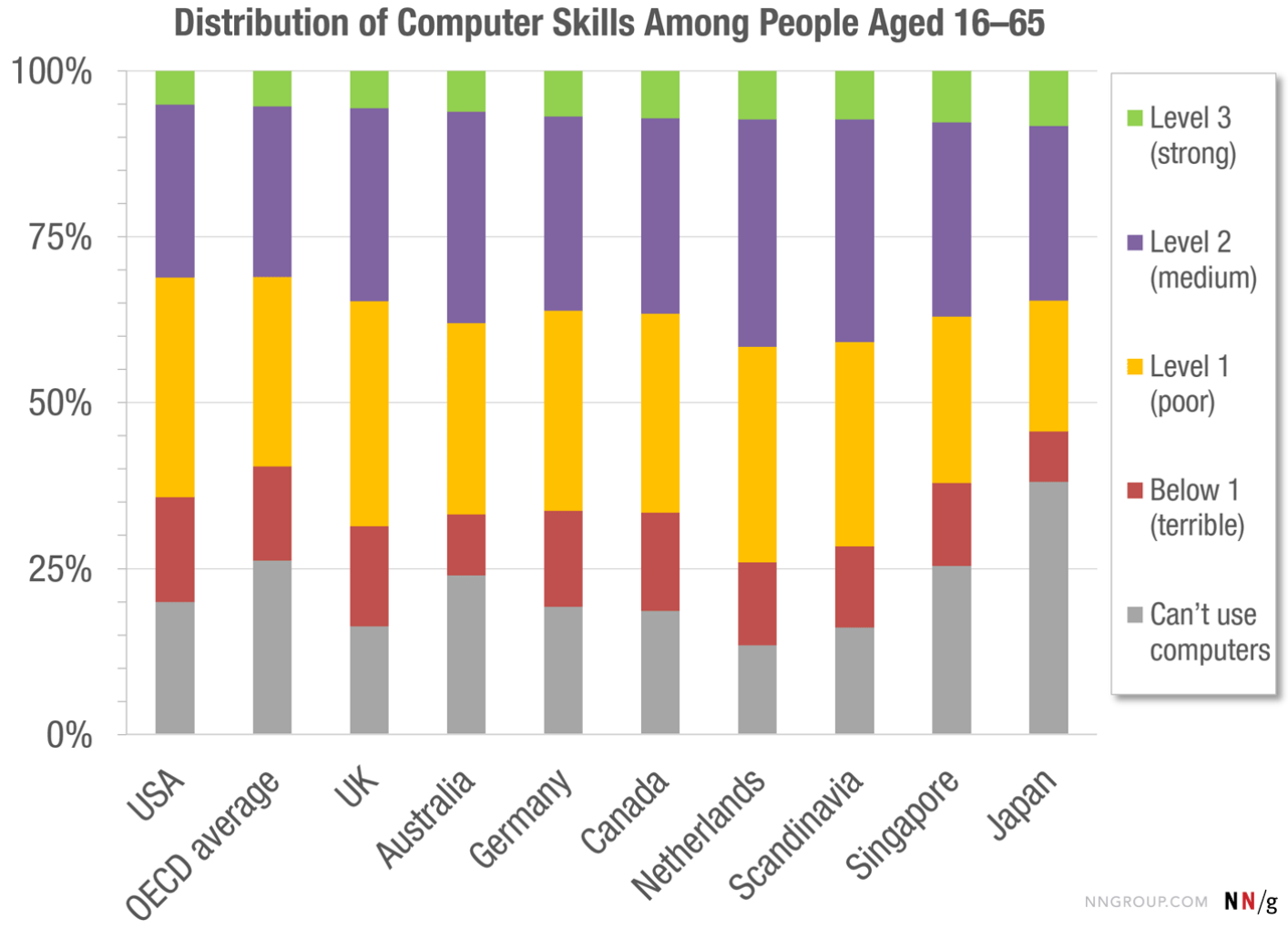
Why user-centered design?

Interaction Design In the Real World: an Industry Perspective

Lecture 12 Guest Lecture (David Bishop) (panopto.com)

Who are users?

- People who will use a product.
- “Designers” - people who create the system
- Designers < > Users



The Distribution of Users’ Computer Skills: Worse Than You Think (nngroup.com)

Know your users – how?

You must

- incorporate the users into the design process
- Integrate empirical studies early into the design

Human-centered design

Design process

problem

solution

Design process stages

pre design: understand the problem

early design: explore design space

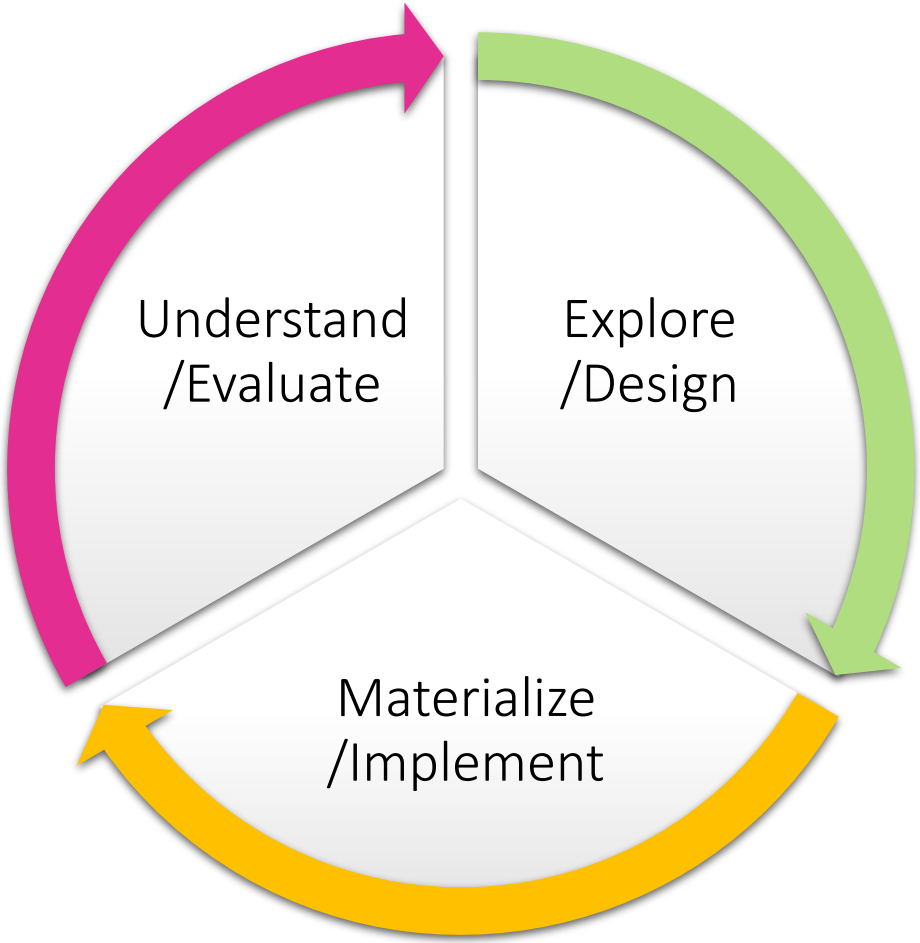
mid design: develop the chosen approach

late design: integrate and start to deploy

User-centered design process

based on:

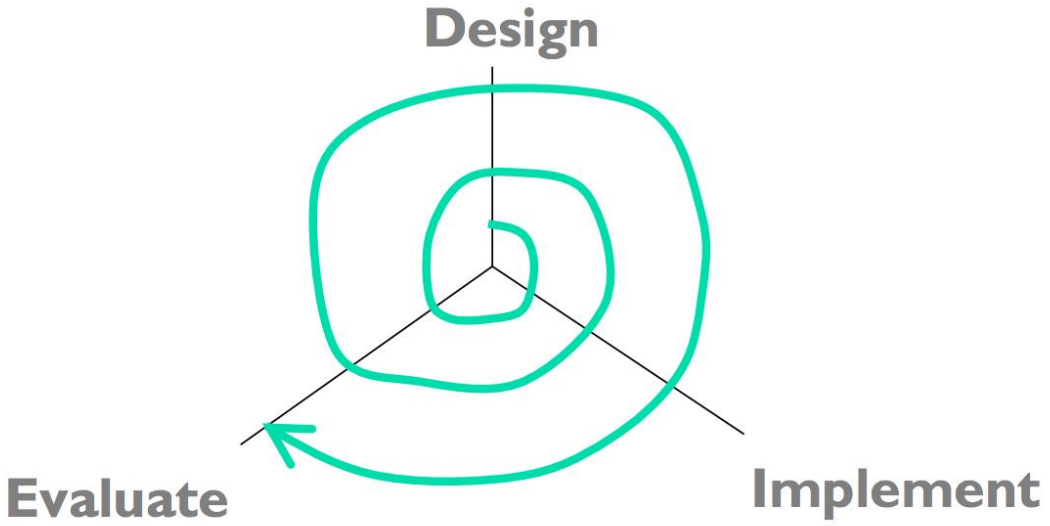
- Early focus on users and tasks: directly studying cognitive, behavioral, anthropomorphic, and attitudinal characteristics
- Empirical measurement: users' reactions and performance to scenarios, manuals, simulations, and prototypes are observed, recorded, and analyzed
- Iterative design: when problems are found in user testing, fix them and carry out more tests
  the solution is **refined by repeated trips** around a design cycle: first imagining it (design), then realizing it physically (implementation), then testing it (evaluation)



Iterative Design

Iterative design process

- You won't get it right the first time!
- The radial dimension of the spiral model corresponds to **the cost of the iteration step** - or, equivalently, its **fidelity or accuracy**.
- Early iteration as cheap as possible - prototypes.

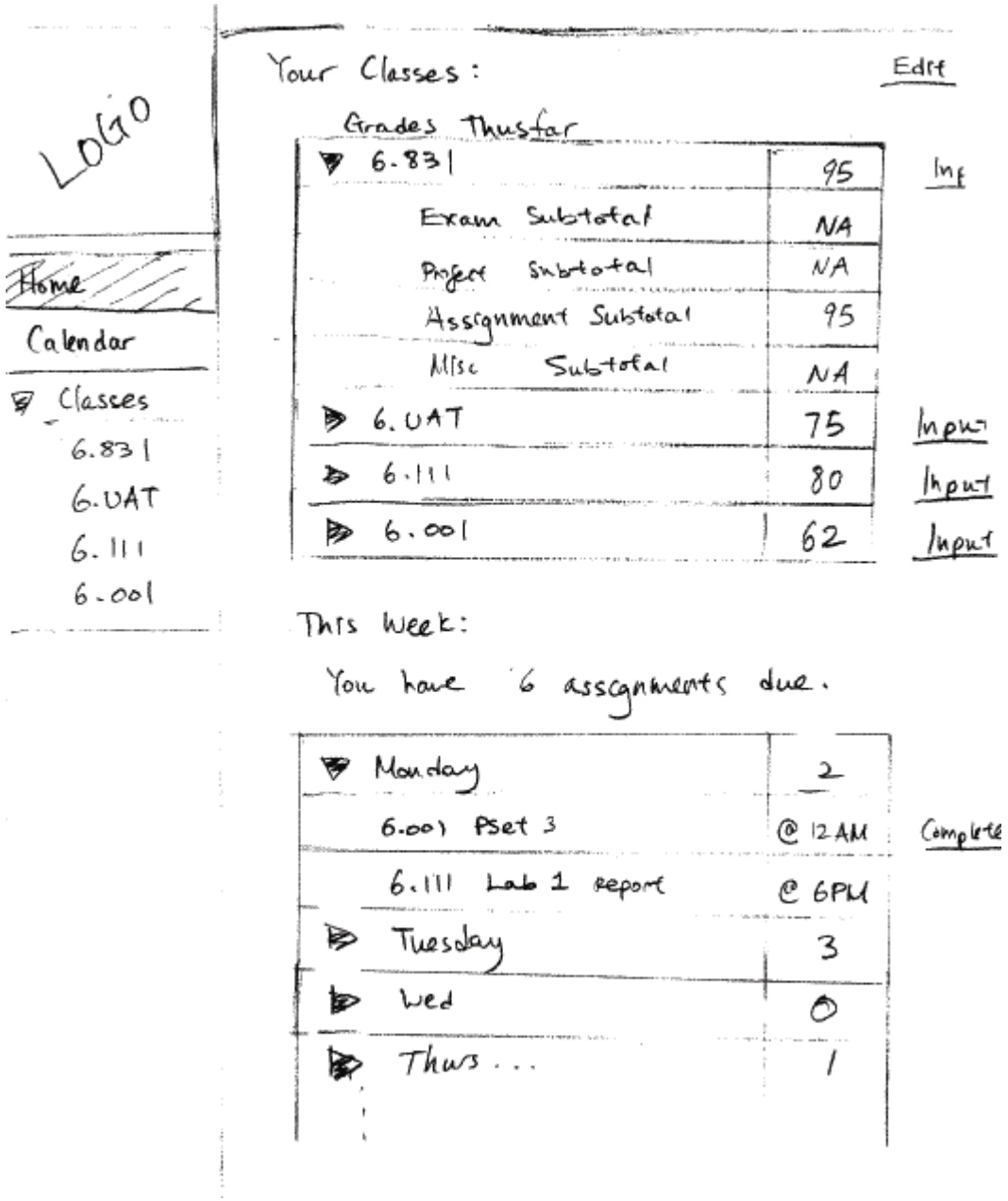


Spiral development model

http://web.mit.edu/6.813/www/sp18/classes/06-user-centered-design/

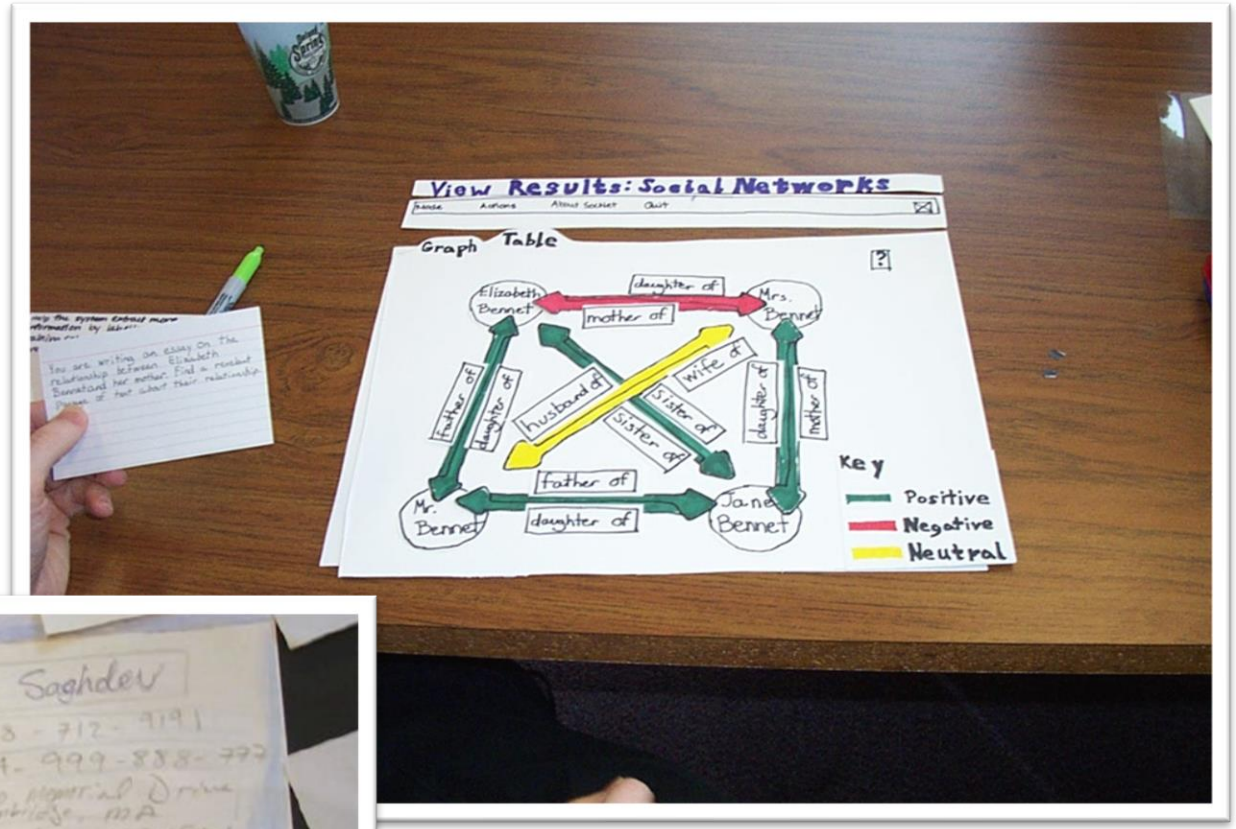
Early Prototyping

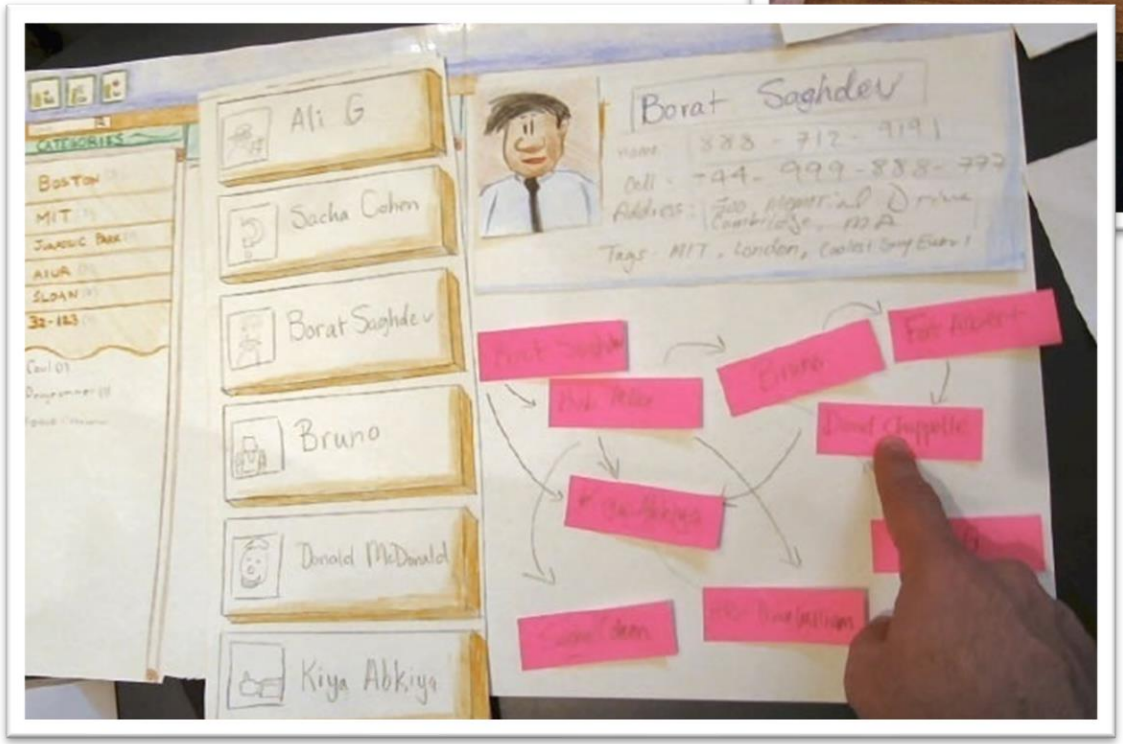
- Sketches
- Paper prototipes
- Digital mockups



Early Prototyping

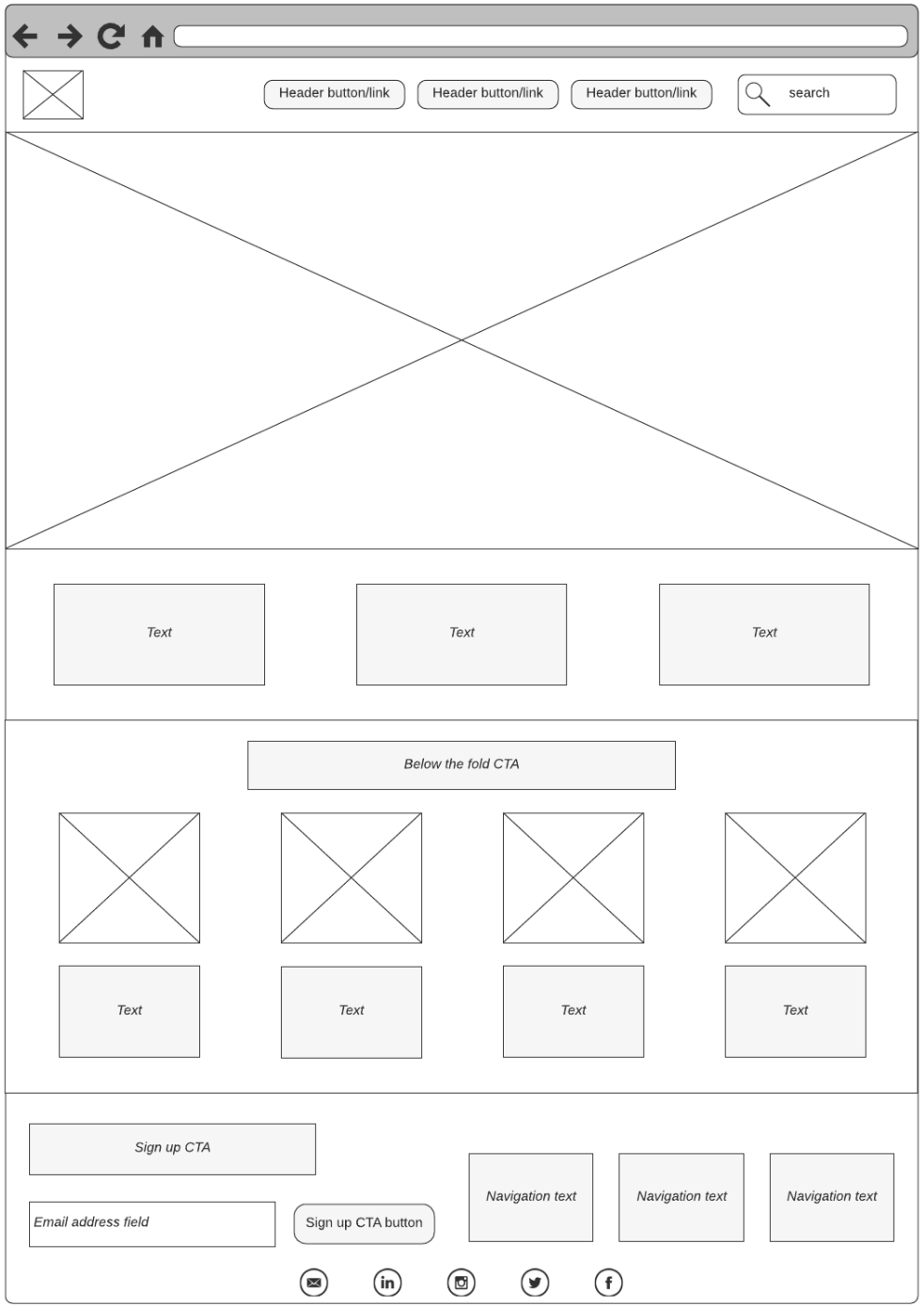
- Sketches
- Paper prototipes
- Digital mockups





Early Prototyping

- Sketches
- Paper prototipes
- Digital mockups

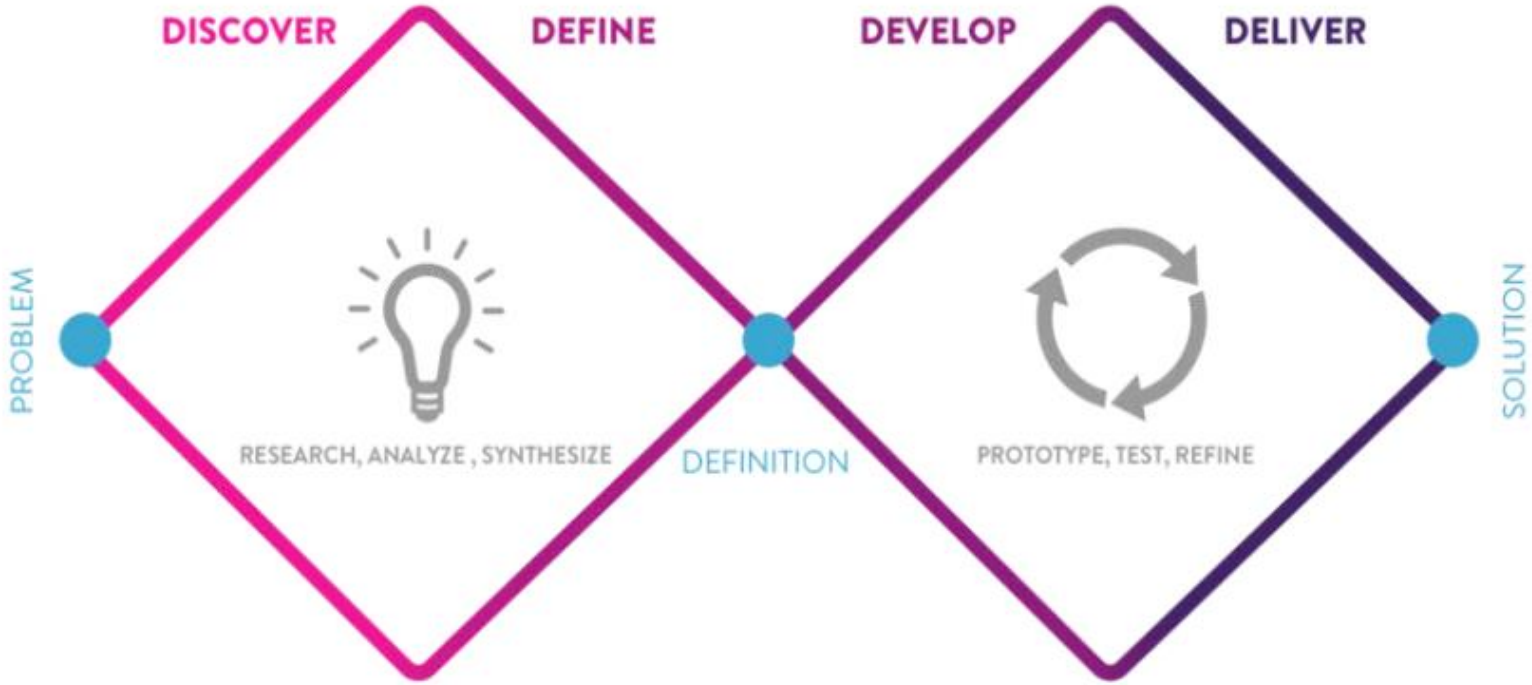


Early Prototyping

- Early prototypes can detect usability problems
- Cheap
- Quick
- Testable

User-centered design process

human activity needing better support



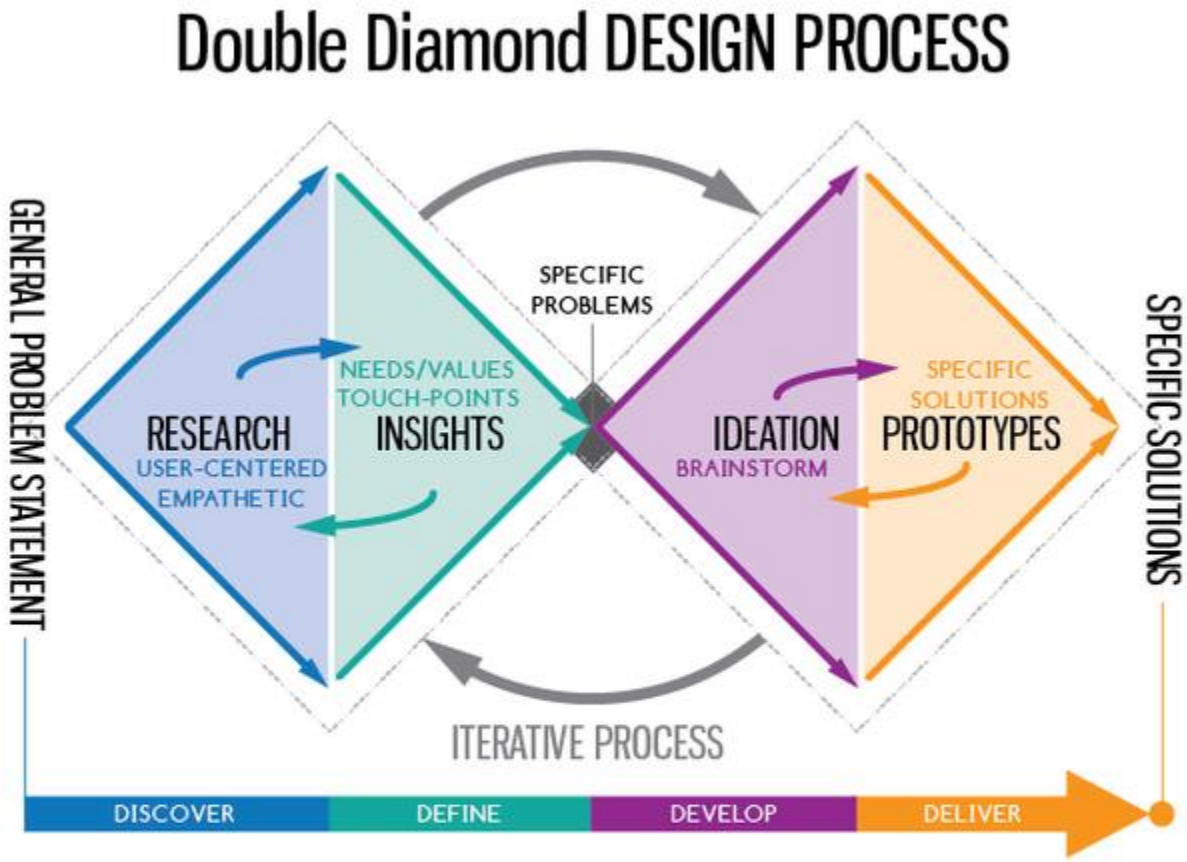
usable and useful interactive system that addresses

Understand the problem

Pre design questions

- Recognize human needs
- do users really have the problem you think they do?
  - is it an important problem for them?
- who are the users? who cares? what is the task?
  - what are your users like? how varied are they? expertise, abilities, priorities, special needs, constraints, ..
  - what non-users are involved in the problem and its potential solution?
  - What are they really trying to do, and what is getting in the way?
- What properties must a solution have?

- OUTPUT: REQUIREMENTS



Service Design Vancouver

User research

- Know your users
  - Age, gender, culture, language
  - Education
  - Physical limitations
  - Technology experience
  - Motivation, attitude
  - Domain experience
  - Application experience
  - Work environment and other social context
  - Relationships and communication patterns with other people
- How?
  - Information-collection
    - Observe
    - Interview
    - Survey
    - Contextual inquiery
  - Analysis

READ

https://hci.stanford.edu/courses/cs447/docs/NeedFindingCribSheet.pdf

WATCH

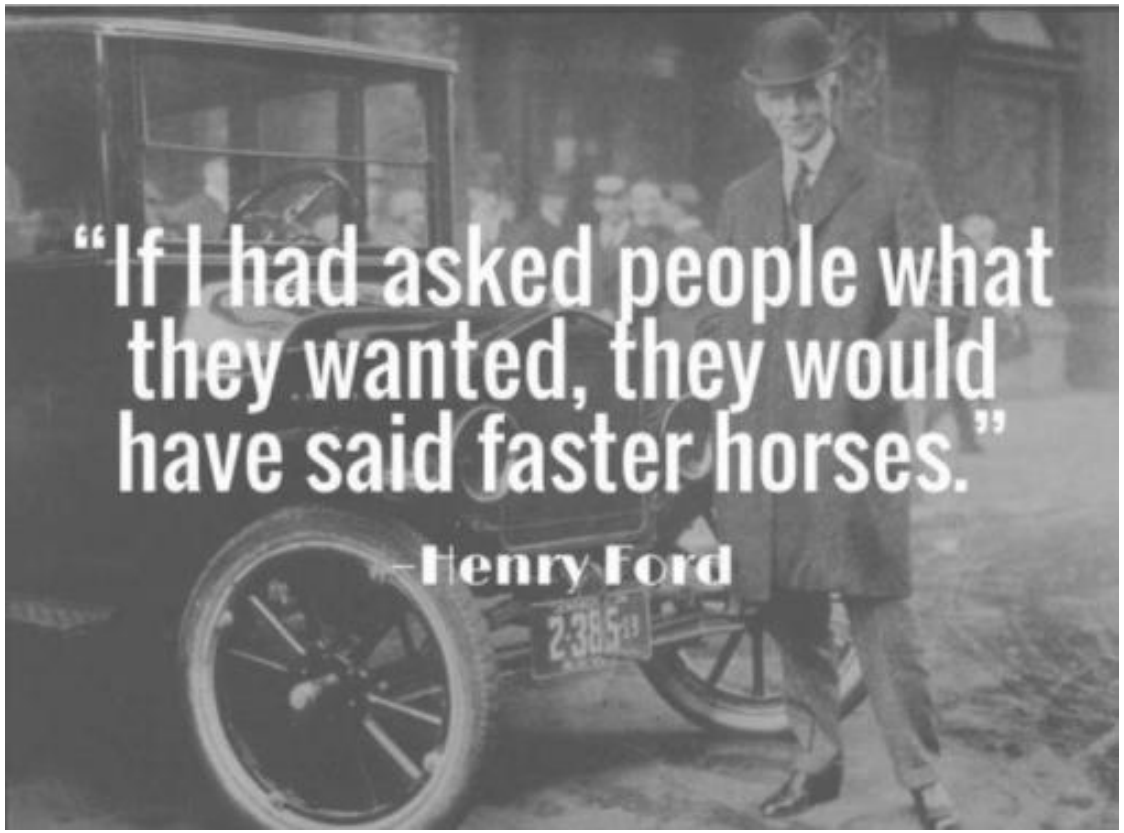
Contextual inquiry lecture 1. part

Contextual analysis lecture 2. part

Contextual inquiry example

Needfinding (user model)

- Establishing design requrements
- Study real users
- Identify user's goals. Question is what problem do you want to solve, NOT what system do you want to build.
- Identify the goals involved in the problem
  - Decompose them into subtasks
  - Abstract them into goals
- Define essential goals, not concrete tasks
  - "Save file to disk" – concrete task (what user do)
  - vs. "Make sure my work is kept" – essential goal (why)

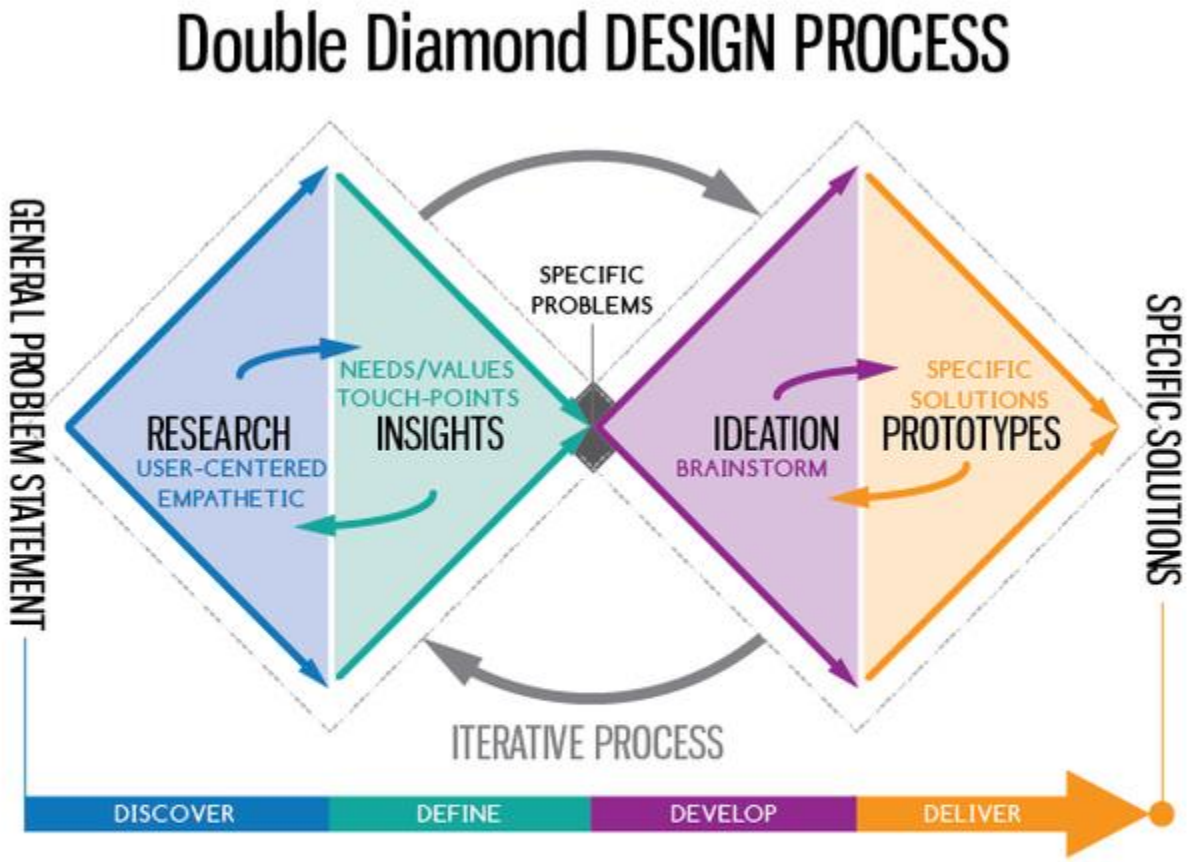


Explore design space

Early design questions

- have you considered all relevant approaches?
- what are the ‘metrics’ that you should be considering as you compare approaches? feasibility, price, complexity, functionality, fit to company focus/intellectual property, …
- what are the high-risk elements of your likely approach, and can you address them?

- OUTPUT: CHOSEN DESIGN APPROACH



Service Design Vancouver

Idea Generation

- Generate ideas individually first
- Then come together as a group and brainstorm
- Write down everything on a board
- IDEO's Rules for Brainstorming
  - Be visual
  - Defer judgment
  - Encourage wild ideas
  - Build on the ideas of others
  - Go for quantity
  - One conversation at a time
  - Stay focused on the topic

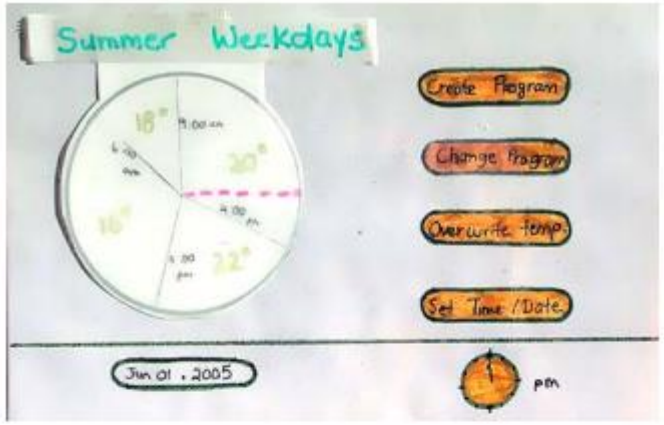


Figure 1. The "Circular" paper prototype

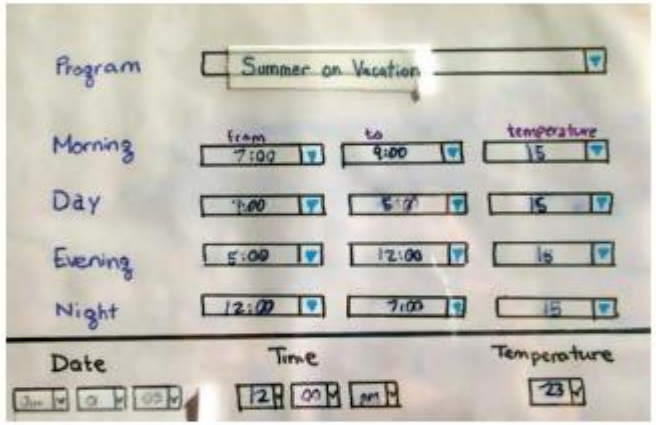


Figure 2. The "Tabular" paper prototype

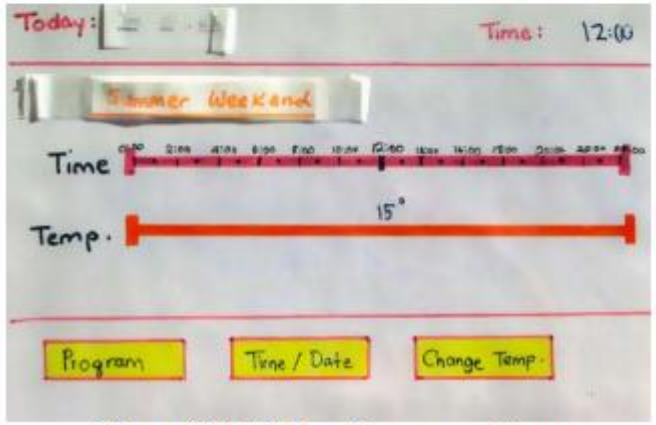


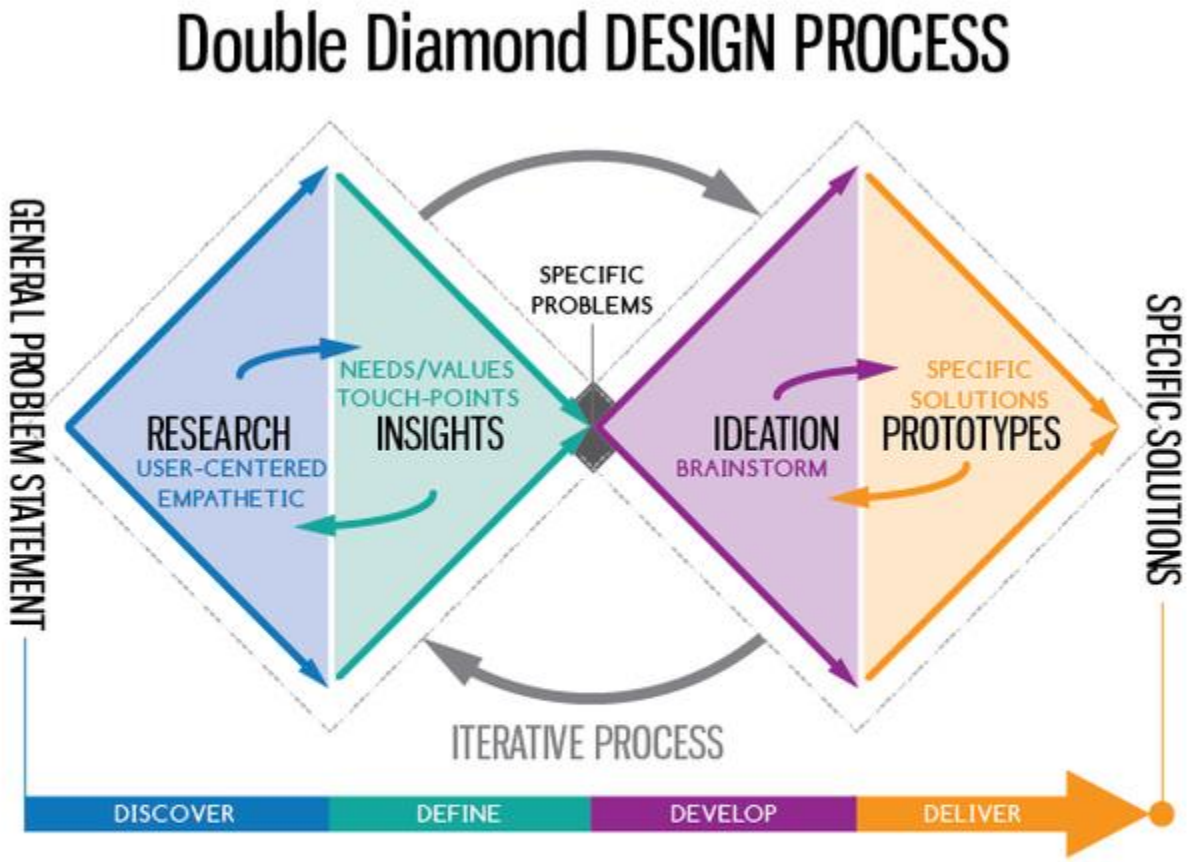
Figure 3. The "Linear" paper prototype

Develop chosen approach

Mid design questions

- are there major “elements” of your design that can be advanced separately? e.g. layout and flow, look-and-feel, technical interface implementation
- what are the major questions / uncertainties / risks associated with each design element?
- what user input will you need to verify your design progress? when, where; how much will it cost and can you afford it?
- what prototypes do you need to support problem solving, including getting user input on your design?

- OUTPUT: DESIGN ELEMENTS CONFIRMED & MOCKED-UP



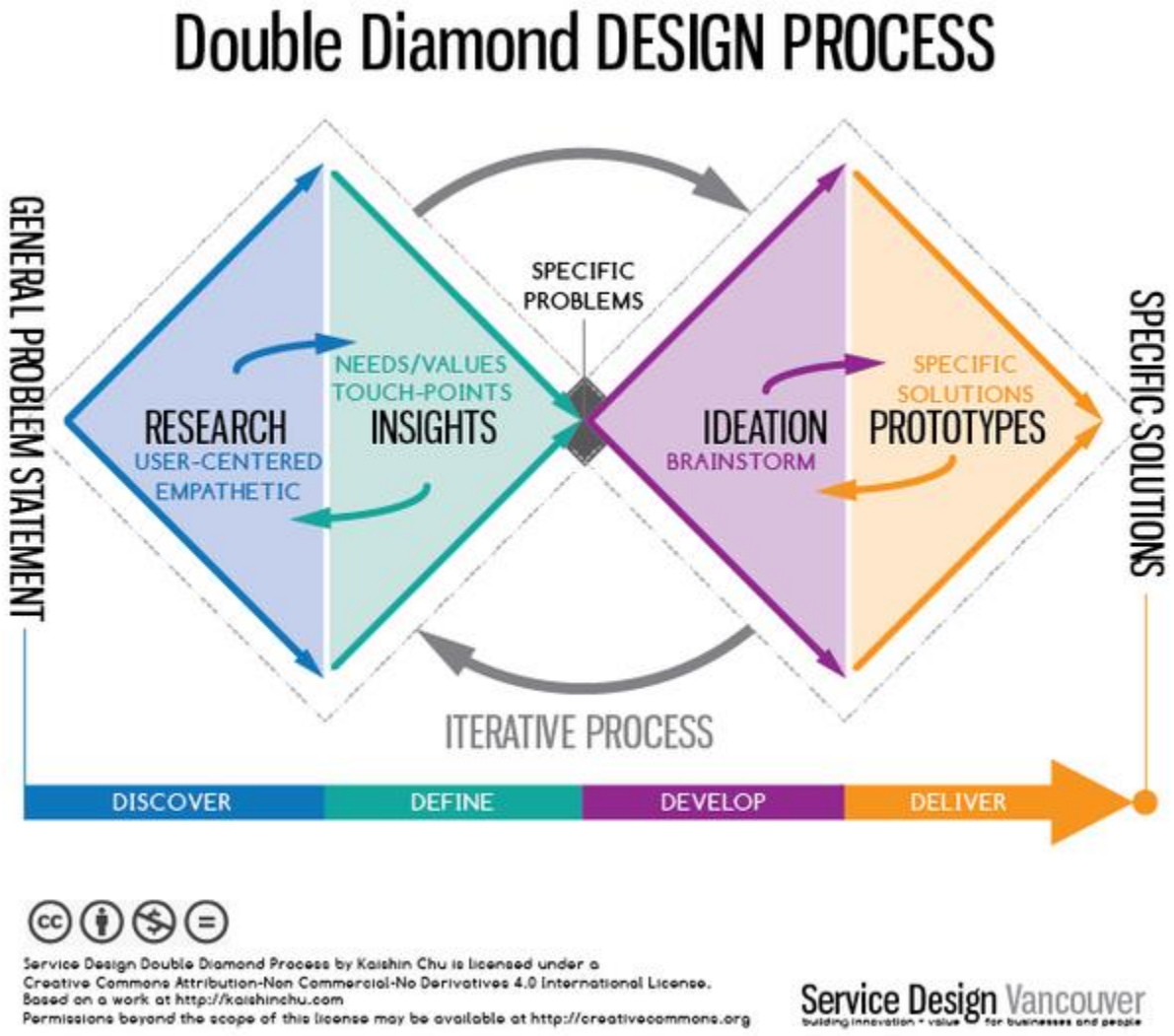
Service Design Vancouver

Field test

Late design questions

- integrate the different design elements
- final delivery platform
- put systems in real users' hands in real contexts for longer durations
- fine-tune, debug

- OUTPUT: RELEASEABLE SYSTEM



Service Design Vancouver

How to involve users?

Pre design	Early design	Mid-late design
ethnography	Interviews, focus groups, observation,	observation, interviews, questionnaires, surveys using advanced prototypes
observation	questionnaires surveys,	heuristic evaluation
interviews	contextual inquiry & work modeling	formal performance / usability testing
focus groups	task analysis, task / cognitive walkthroughs	
questionnaires	participatory design	
surveys	heuristic evaluation	
contextual inquiry		

Who and how?

- early: for understanding
- later: for input on your design approach and details
- Problems:
- deadlines and budget limit
- challenges to involve the right users in right time
- direct users may not be the only one affected by the system—**stakeholders**

- stakeholder = anyone who has some reason to care about the interface
  - direct users: convenience, functionality, …
  - manager of the direct users: work-efficiency, cost-efficiency
  - developer: ease of development—deadlines, budget
  - manufacturer: cost of production
  - advertiser: visibility
- how to figure out who your stakeholders are:
  - who will ask for it?
  - who will use it?
  - who will decide whether to use it? (or if someone else will use it?)
  - who will pay for it?
  - who has to make (design / build) it ?
  - who has to make a profit from it?
  - who will otherwise make your life miserable if they don't like it?