

User Interface Design & Implementation

UI Design Methods

Week 4 – Lecture 8

Design Methods

- Day-to-day activities in the design process
- Understand users and requirements
 - Ethnographic observation (aka contextual inquiry or field studies)
 - Surveys, interviews and focus groups
- Ideate and design
 - Scenarios, storyboards, personas
 - Collaborative sketching
 - Design patterns
- UI prototyping [covered in later lecture]
- UI evaluation [covered in later lecture]

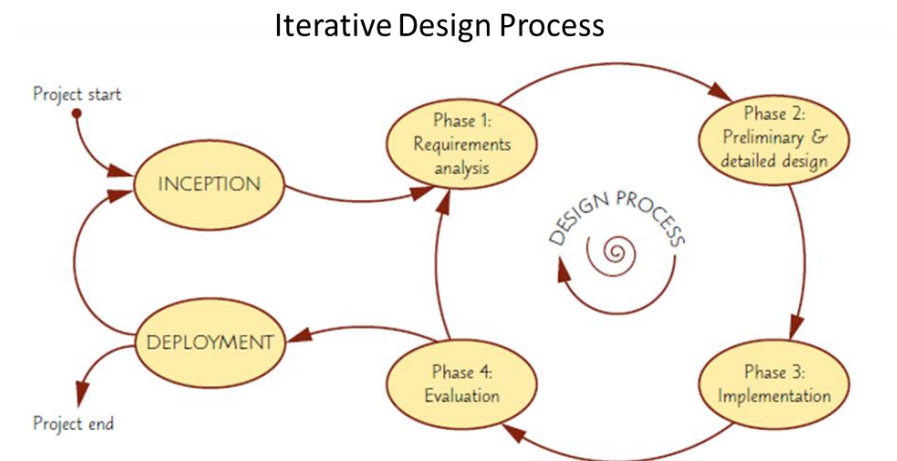
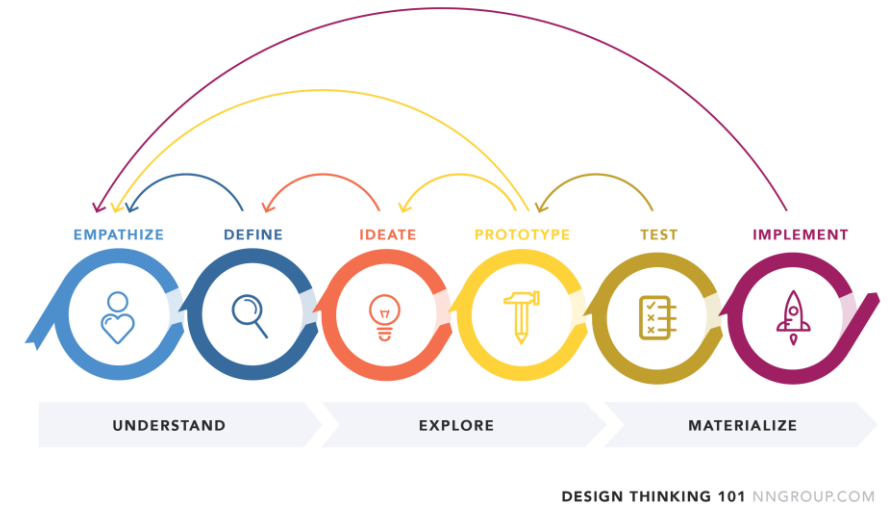


Image from *Designing the User Interface*, 6th Ed.

Ethnographic Observation

- Gather data and insights through **direct observation** of users in action
 - Users' physical environment
 - Users' tasks, intentions and goals
 - People the users work with
 - Artefacts the users work with
 - Cultural influences (expectations, desires, policies, values, etc.)
 - Workarounds and breakdowns in current processes
- Understand what will help users achieve their goals
- Help define requirements, set priorities, and influence the design of solutions.

Articles about ethnographic observation:
<https://www.nngroup.com/articles/field-studies/>
<https://www.nngroup.com/articles/field-studies-done-right-fast-and-observational/>

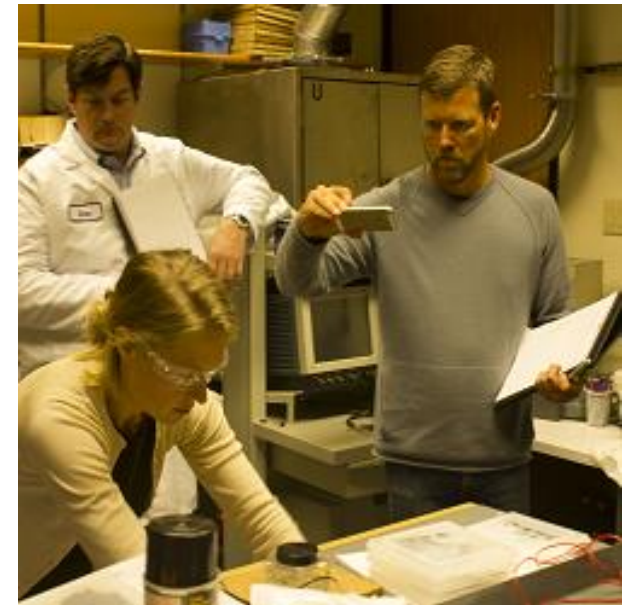


Image from PARC

Contextual Inquiry

Some of the following slides adapted from HCII (CMU) course material.

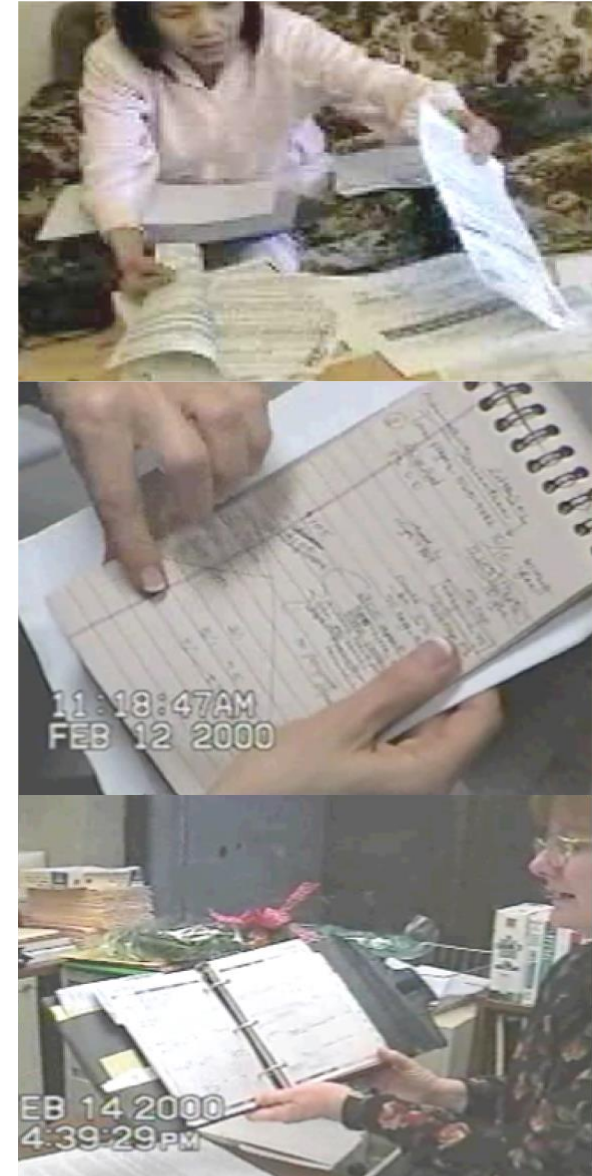
- A framework for doing ethnographic observation
 - Objective: design/redesign work processes, software, products, etc.
 - Developed by Karen Holtzblatt
 - Recommended readings (available in SUTD eLibrary)
 - *Contextual design: design for life* (2016)
 - *Rapid contextual design: a how-to guide to key techniques for user-centered design* (2005)
- Principles in Contextual Inquiry
 - Context
 - Understand user's needs in their environment
 - Partnership
 - Work with users as co-investigators
 - Interpretation
 - Assign meaning to observations
 - Focus
 - Listen and probe from a clearly defined set of concerns

Book chapter on
Contextual Inquiry/Design:
<https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/contextual-design>

Videos about Contextual Inquiry:
<https://www.youtube.com/watch?v=5gLe6PBZLzo>
<https://www.youtube.com/watch?v=JV6br-npgfw>

Contextual Inquiry – Context

- Go to the user(s) & see their work as it unfolds
- Seek concrete data
 - Direct conversation about ongoing work
Customer: *"I usually record appointments in my calendar"*
Interviewer: *"Could you go ahead & walk me through the process"*
 - If direct observation is not possible, elicit retrospective accounts
"Think about the last time you used System-X. Take me through the steps you went through with the system to get the job done."



Contextual Inquiry – Context

- Avoid summary information
 - Don't ask:
"What do you dislike about the ordering system"
 - Instead ask:
"Could you show me what you have to do in order to place an order. Let me know about things you like and don't like about the process as we go through it"
- Avoid abstract data
 - Watch out for words like "usually", "generally" etc.
 - Abstractions are open to interpretation & can compromise the concrete data needed to guide design
 - Instead, direct conversation towards ongoing work or recent past events
 - You want responses that include words like:
"Let me show you..."
"Here's how I do it ..."
"Last time, I ..."

Contextual Inquiry – Context

- Pay attention to what user(s) are doing and saying
 - Flow of work
 - Sequence of work
 - Culture of work
 - Artifacts used in the work
 - Physical environment that supports the work
- Follow-up on items in focus
 - Pick up on words and concepts the user used
 - Make sure you fully understand
 - Ask users to give examples, step-by-step accounts
- Be enthusiastic, interested, and understanding
 - A good listener
 - Pay attention to communication that is non-verbal



Image from UXMastery

Contextual Inquiry – Partnership

- Make the user and you collaborators in understanding the user's activities
- Do not assume role of interviewer
 - Ongoing work ceases in a question & answer mode
 - Instead, questions should be in context of ongoing work
- Do not assume role of expert
 - Answering user questions about system alters their behaviour
 - Instead: *"Why don't you go ahead & do what you'd do if I weren't here, I'll answer any questions you may have at the end."*
- Do not assume role of guest
 - Being overly polite may inhibit the kind of interaction that may lead to a better understanding of work.
 - Instead, be nosy! Watch, clarify and probe.

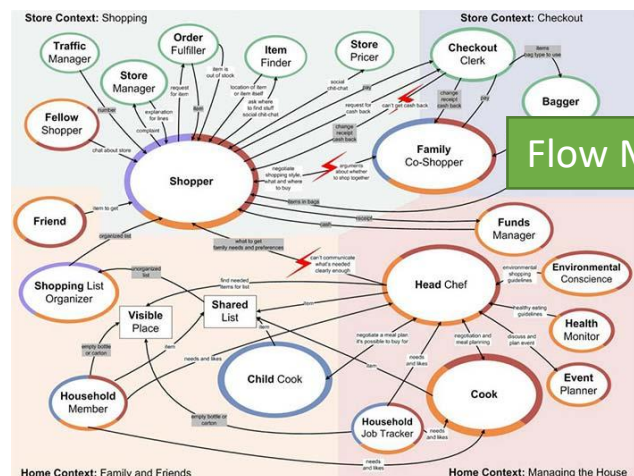
Contextual Inquiry – Interpretation

Data and insights

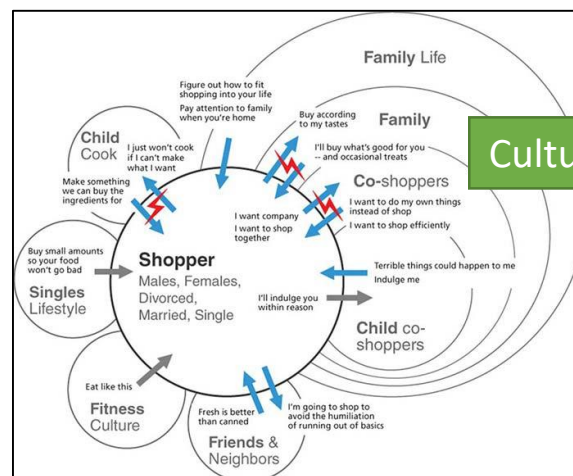
Work models

Implications for design

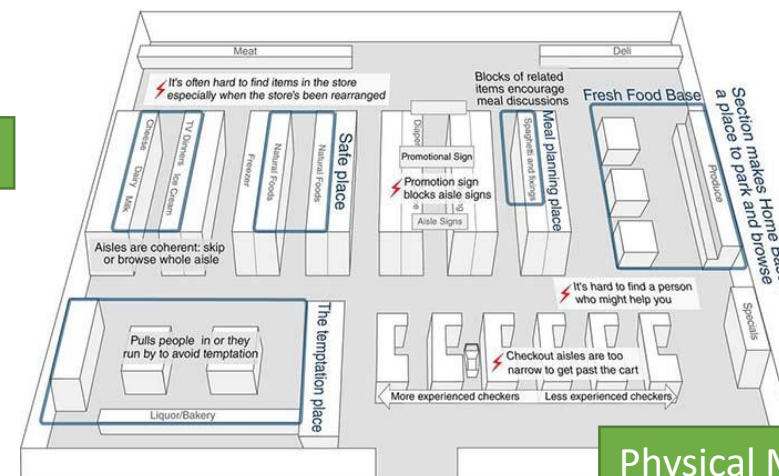
Design ideas



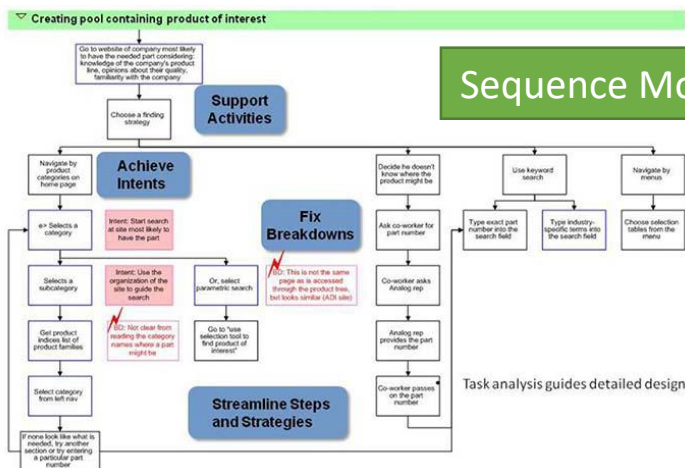
Flow Model



Cultural Model



Physical Model



Sequence Model



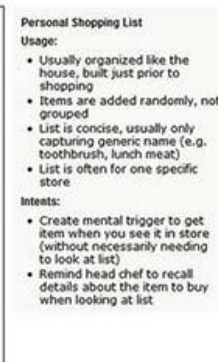
Consolidated Shopping List



Family Shopping List



Personal Shopping List



Personal Shopping List

Images from *The Encyclopaedia of Human Computer Interaction*, 2nd Ed.

Contextual Inquiry – Focus

- The key concerns/issues in the contextual inquiry session
 - Set of assumptions and beliefs
 - Directs the selection of participants
 - Directs questioning and helps keep conversation on useful topics
 - Supports understanding and gathering of rich data
- Do allow focus to steer conversation
- Do allow **focus to change**
 - Probe surprises & contradictions
 - Probe what you don't know or understand
 - Be wary of nodding in agreement (Do you REALLY understand?)
- Do challenge focus assumptions instead of trying to validate them
- Focus will be different at different stages of design development

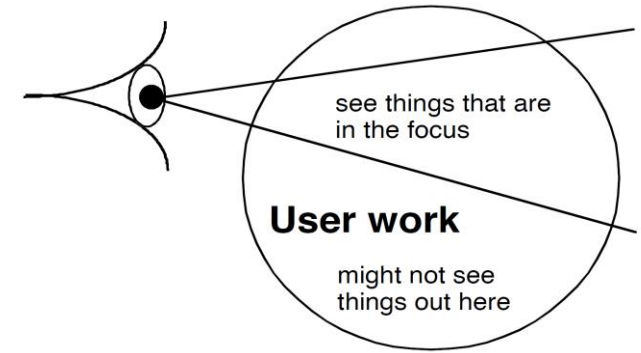


Image from HCII (CMU) course material

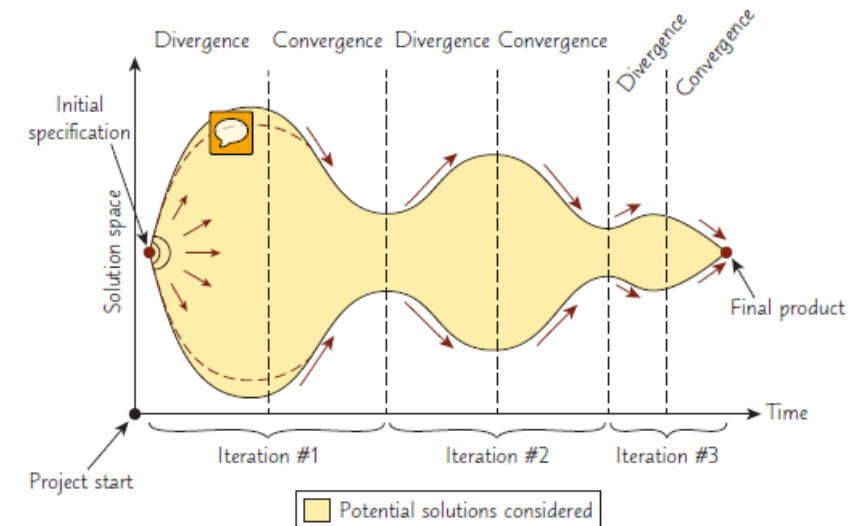
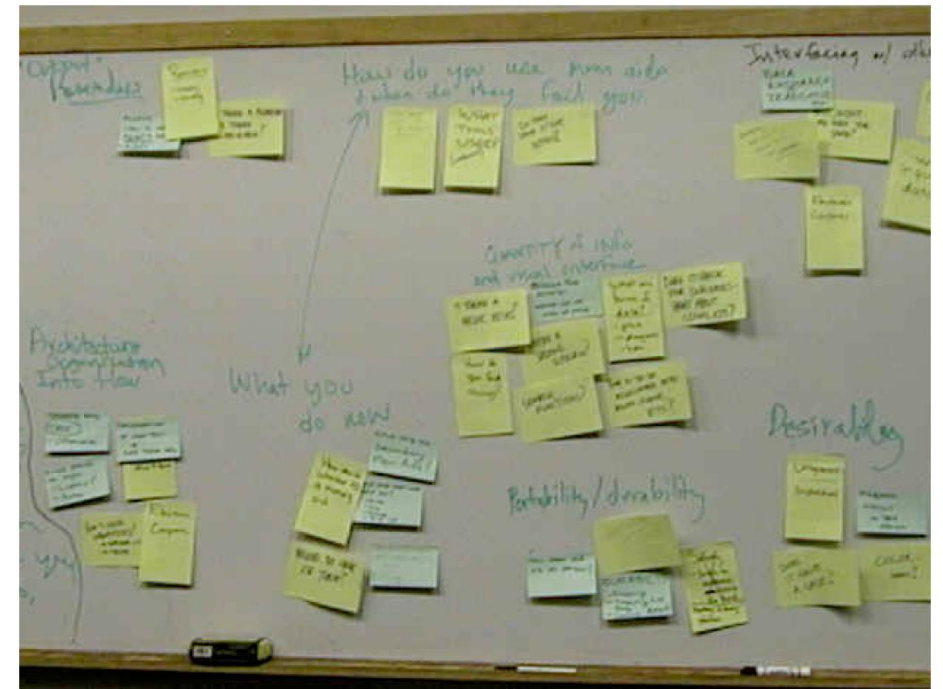


Image from *Designing the User Interface, 6th Ed.*

Contextual Inquiry – Focus

- Seven steps to setting focus
 1. Form team of stakeholders
 2. Brainstorm: questions, assumptions, design ideas
 3. Record items generated
 4. **Prune** items
 - E.g. questions that participants are unable to answer
 5. Do an affinity diagram of remaining items
 6. Develop generalized focus statements
 - Reduce to a few statements that summarize the focus
 7. Review the focus with team
 - Can the team understand the focus?
 - Can the team generate new open-ended questions from the focus?



Affinity Diagram
Image from HCII (CMU) course material

Surveys, interviews and focus groups

- Survey

- A person answers written questions in a questionnaire, or
- An interviewer administers a fixed set of questions as in a telephone or street survey
- Factual data: “fixed choice” questions usually best, plus “open-ended” questions
- Reach **larger sample** of user population

- Interview

- Researcher asks a person questions interactively
- Opportunity to clarify questions and to ask follow-up questions and probe
- Richer data, more details and in-depth exploration
- **More expensive and time-consuming** – smaller sample of user population

- Focus group

- Researcher facilitates a group discussion on focus question(s)
- Not a group interview – data and insight produced by the interaction between participants
- Artefacts may be used to promote lively discussion

Interview techniques

- What good interviewers do:
 - Repetition and rephrase
 - Get behind the behavior
 - Ask for examples
 - Ask for step-by-step
 - Clarify terms and concepts (even if you think you know it)
 - Summarize and draw out a conclusion or concept
- What novice interviewers do (so don't do these!):
 - They give their opinions
 - People want to please and interviewer opinions shape what people tell them
 - They do all the talking
 - They forget the interview is not about them
 - The interviewer should aim for 20-25% of total interview word count
 - They fail to follow up interviewee remarks
 - When inspiration fails, ask *“can you tell me more about that?”*

What people do and do not often know

- What people do know:
 - What they do
 - How they do things
 - Their opinions about their current activities
 - Their complaints about their current activities
 - How much they like one thing that they know compared with another thing that they know
- What people do not often know:
 - What they would do/like/want
 - E.g. asking people if they would like a new feature, option or product
 - The last time they did something
 - How often they do things
 - How much they like things on an absolute scale
 - If you ask, they will “guestimate”
 - How to design a user interface
 - Anything that makes people imagine hypothetical situations

Scenarios, Storyboards and Personas

- Scenarios (aka **use-cases**)
 - Descriptions of how users engage with the interactive system to perform tasks to achieve goals
 - Can be represented in written paragraphs, tables of task sequences, flowcharts, transition diagrams, etc.
 - Can be acted out as a form of physical walkthrough and made into videos
- Storyboards
 - Illustrated scenarios
- Personas
 - Fictional, yet realistic, description of a typical or target user
 - Based on data and insights from contextual inquiry, surveys, interviews, focus groups, etc.
 - Compelling identities that reinforces “the user is not like me”

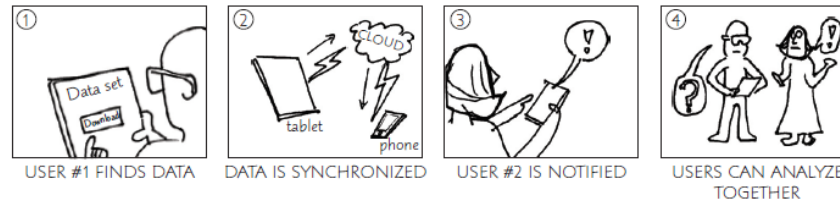


Image from *Designing the User Interface*, 6th Ed.

Articles about personas:

<https://www.nngroup.com/articles/persona/>

<https://www.interaction-design.org/literature/article/personas-why-and-how-you-should-use-them>

Collaborative Sketching

- A popular method for ideation of designs in Design Thinking
- Steps (adapted from linked article)
 1. Everyone gets a sheet of paper and a pen (same type and colour).
 2. Discuss what should be sketched
 - depending on how far into the design process,
 - everyone sketches a different idea (for idea creation; divergence), or
 - everyone sketches the same idea (for enriching an idea with details; convergence).
 3. Limited time to sketch.
 4. After time period, everyone hands their sketch over to the next person.
 5. Limited time to understand what is there and add on to the sketch.
 6. Circulate each sketch until everyone has contributed.
 7. Present and discuss the outcome in the group.

Article about collaborative sketching:
<https://experience.sap.com/skillup/collaborative-sketching-drawing-a-bridge-between-ideation-and-prototyping/>

Interaction Design Patterns

- Best-practice solutions to commonly occurring problems
- Specified in such a way that they can be reused and applied to slightly different variations of a problem
- Examples of interaction design patterns mentioned in *Designing the User Interface 6th Ed.*:
 - Model-View-Controller (MVC)
 - Document interface (SDI, MDI, TDI)
 - Web application page architecture (MPA, SPA)

More examples of interaction design patterns:

<https://www.nngroup.com/articles/footers/>

<https://www.nngroup.com/articles/popups/>

<https://www.nngroup.com/articles/ui-accelerators/>

<https://www.nngroup.com/articles/cancel-vs-close/>

<https://www.nngroup.com/articles/animation-purpose-ux/>

Dark Patterns

- Dark patterns are UI design tricks that make users do things that they didn't mean to.

Resources, articles and video about dark patterns:

<https://www.darkpatterns.org/>

<https://www.shopify.com.sg/partners/blog/dark-patterns>

<https://uxdesign.cc/dark-patterns-in-ux-design-7009a83b233c>

<https://www.youtube.com/watch?v=5yj1GH111Xc>

- Do not use dark patterns!
 - Product may gain short-term benefits (more signups, larger mailing lists, etc.)
 - Users will abandon the product in due course