CHALMERS | UNIVERSITY OF GOTHENBURG

DIT045 H17 Requirements and User Experience

Intro to UX & Prototyping

Jennifer Horkoff
Email: jenho@chalmers.se

What is User Experience?

- "Know they users, for they are not you!"
- Step 1: figure out what users are trying to accomplish
  - E.g., no one wants to fill out a form for the sake of filling a form
- Step 2: design, make familiar by using patterns

(Tidwell)

- User experience: the experience the product creates for the people who use it in the real world
- "UX is not about the inner workings of a product or service. User experience is about how it works on the outside, where a person comes into contact with it. When someone asks what it's like to use a product or service, they're asking about the user experience. Is it hard to do simple things? Is it easy to figure out? How does it feel to interact with the product?"

(Garrett)

What is User Experience? (part 2)

- UX has three main defining characteristics:
  - A user is involved
  - That user is interacting with a product, system, or really anything with an interface
  - The user's experience is of interest, and observable and measurable
- In absence of a user doing something, we might just be measuring attitudes and preferences
  - Or requirements!

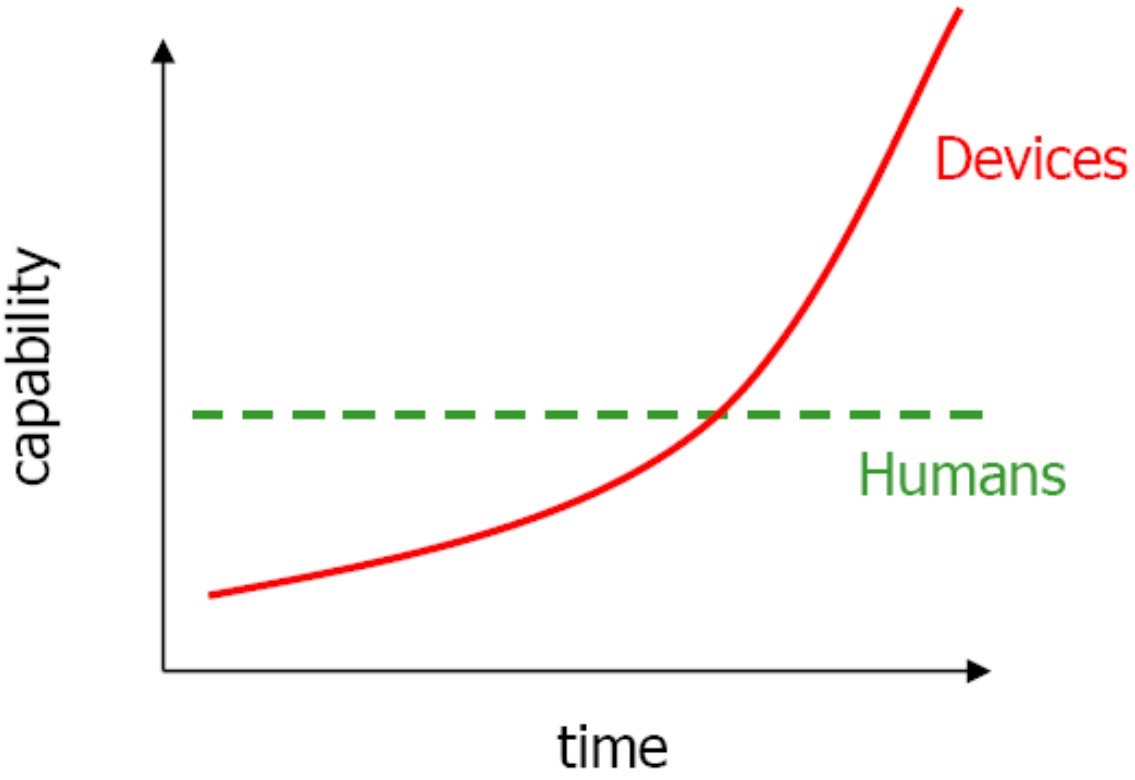
(Tullis & Albert)

- User experience can mean the difference between life and death
  - 98,000 Americans die each year due to medical error
  - UI design at least partially to blame

Why is UX Important?

- Efficiency, Time
- User satisfaction
- Sales, attracting and keeping customers
- Safety
- Sanity

Creeping Featurism



Buxton, W. (2001). Less is More (More or Less), in P. Denning (Ed.), The Invisible Future: The seamless integration of technology in everyday life. New York: McGraw Hill, 145 – 179.

Based on:

•Y. Rogers, H. Sharp and J. Preece. Interaction Design: Beyond Human-Computer Interaction. Willey, 2011.

•on-line lecture material: http://www.id-book.com

Terminology (Part 1)

- Usability: The ability of a user to use a thing to carry out a task successfully
- UX (User Experience): a broader view, looking at the individual's entire interaction with the thing, as well as thoughts, feelings and perceptions
- UI (User Interface): the part of the system that the users sees and interacts with (screens, buttons, etc.)

(Tullis & Albert)

Terminology (Part 2)

- HCI (Human-Computer Interaction):
  - "researches the design and use of computer technology, focused on the interfaces between people (users) and computers.
  - Researchers observe the ways in which humans interact with computers and design technologies that let humans interact with computers in novel ways.
  - human-computer interaction is situated at the intersection of computer science, behavioral sciences, design, media studies, and several other fields of study. " (Wikipedia)
- UCD (User-Centered Design) (or User-Driven Development (UDD))
  - "a framework of processes (not restricted to interfaces or technologies) in which usability goals, user characteristics, environment, tasks and workflow of a product, service or process are given extensive attention at each stage of the design process."
  - "The chief difference from other product design philosophies is that user-centered design tries to optimize the product around how users can, want, or need to use the product, rather than forcing the users to change their behavior to accommodate the product." (Wikipedia)

Terminology Continued

- UX vs. HCI
  - HCI is theoretical research, research which should be (more or less) generally applicable
  - UX practice focuses on how to design the experience for specific systems
  - HCI theories and findings should contribute to UX practice
  - UX practice should influence HCI research

https://www.uxmatters.com/mt/archives/2014/08/what-is-the-relationship-between-hci-research-and-ux-practice.php

- UCD vs UX
  - UX is the experience of the user, while
  - "UCD is about choosing from a collection of activities and methods from the disciplines of Human Factors and Psychology to form a strategy for engineering the user experience that businesses and organizations want their users and customers to have."

https://chaione.com/blog/ux-ucd/

UCD

Research>	Concept>	Design>	Development>	Implementation>
Stakeholder interviews	Card Sorts	Wireframes	Usability Testing	Usability Testing
Metrics	Information Architecture	Paper Prototypes	Bug Testing	Bug Testing
Competitive Analysis	Flowchart	Interactive Prototypes	Content Creation	Post-Launch Surveys
Surveys	User Stories	Desirability Testing		Metrics to Demonstrate Improvements/ Success
Interviews	User Interaction Flowchart	Usability Testing		Continued User Research
Focus Groups	System Interaction Flowchart			
Ethnographic studies	Content Inventory			
Field Studies	Content Maps			
Task Analysis	Accessibility Planning			
Diary Studies				
Desirability Testing				
Usability testing				

Process is iterative!

https://blogs.uoregon.edu/uxuo/2013/09/20/ucd-ux-usability-so-whats-the-difference/

And... Interaction Design

- A *systematic* way to go about developing *usable* interactive products and interfaces
- What is "systematic" and why do we care?
  - Unsystematic: Rely on your intuition, talent and.. good luck!
  - Systematic: follow defined processes and principles, established by decades of development.

Based on:

•Y. Rogers, H. Sharp and J. Preece. Interaction Design: Beyond Human-Computer Interaction. Willey, 2011.

•on-line lecture material: http://www.id-book.com

Definitions

"*Designing interactive products to support the way people communicate and interact in their everyday and working lives*"

Sharp, Rogers and Preece (2007)

"*The design of spaces for human communication and interaction*"

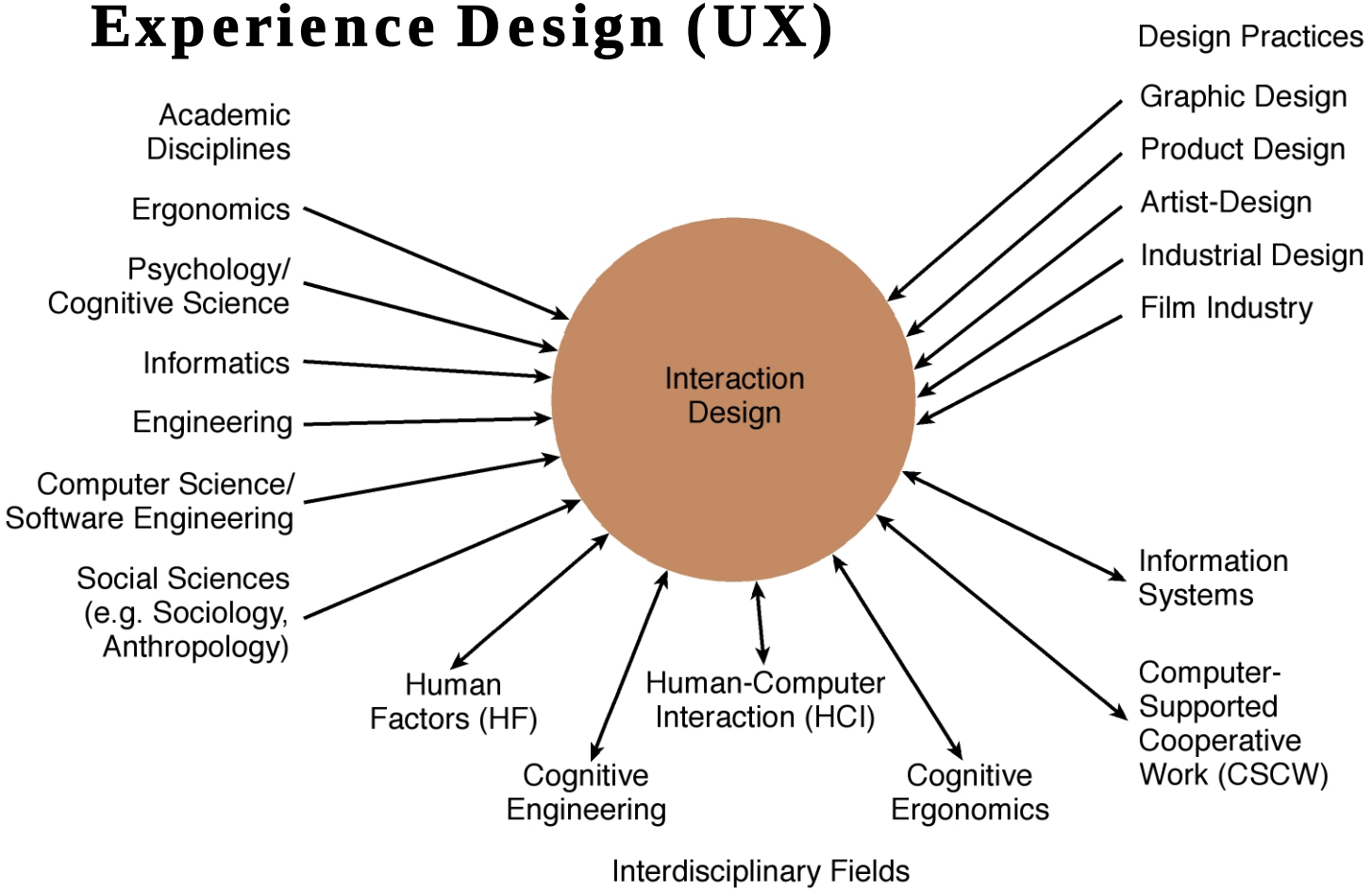
Winograd (1997)

Jennifer's notes:

User-centered design ≈ Interaction Design

Other Names and Related Disciplines

- Related terms: User Interface Design, Software Design, User-centered Design, Web Design, **Experience Design (UX)**



Careers Related to Interaction Design

- **interaction designers** - people involved in the design of all the interactive aspects of a product
- **usability engineers** - people who focus on evaluating products, using usability methods and principles
- **web designers** - people who develop and create the visual design of websites, such as layouts, navigation schemes
- **information architects** - people who come up with ideas of how to structure information (e.g. corporate web-sites)
- **user experience designers (UX)** - people who do all the above but who may also e.g. carry out *field studies* to inform the design of products (how they are used, *appropriated* etc)

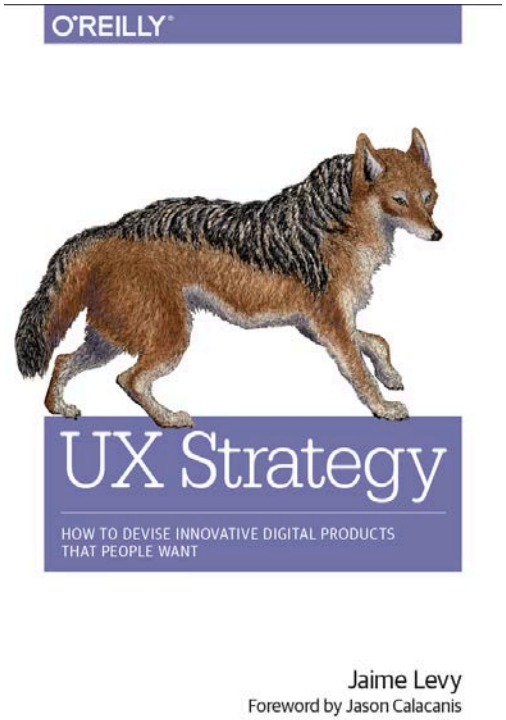
What is Involved

- Identifying needs and establishing requirements: **functional** and **usability goals**, **experience goals**, **context** and **user** characteristics
- Developing **alternative designs** to meet these requirements
- Building **interactive prototypes** that can be communicated and assessed
- **Evaluating** what is being built throughout the process and the user experience it offers
- Process is **iterative** and **user-centered.**

UX Strategy

- Can think of UX Strategy as UX at a high-level
- What to build and why?
- UX Strategy consists of:
  - Business Strategy
  - Value Innovation
  - Validated User Research
  - “Killer” UX

(Levy, Chapter 1)



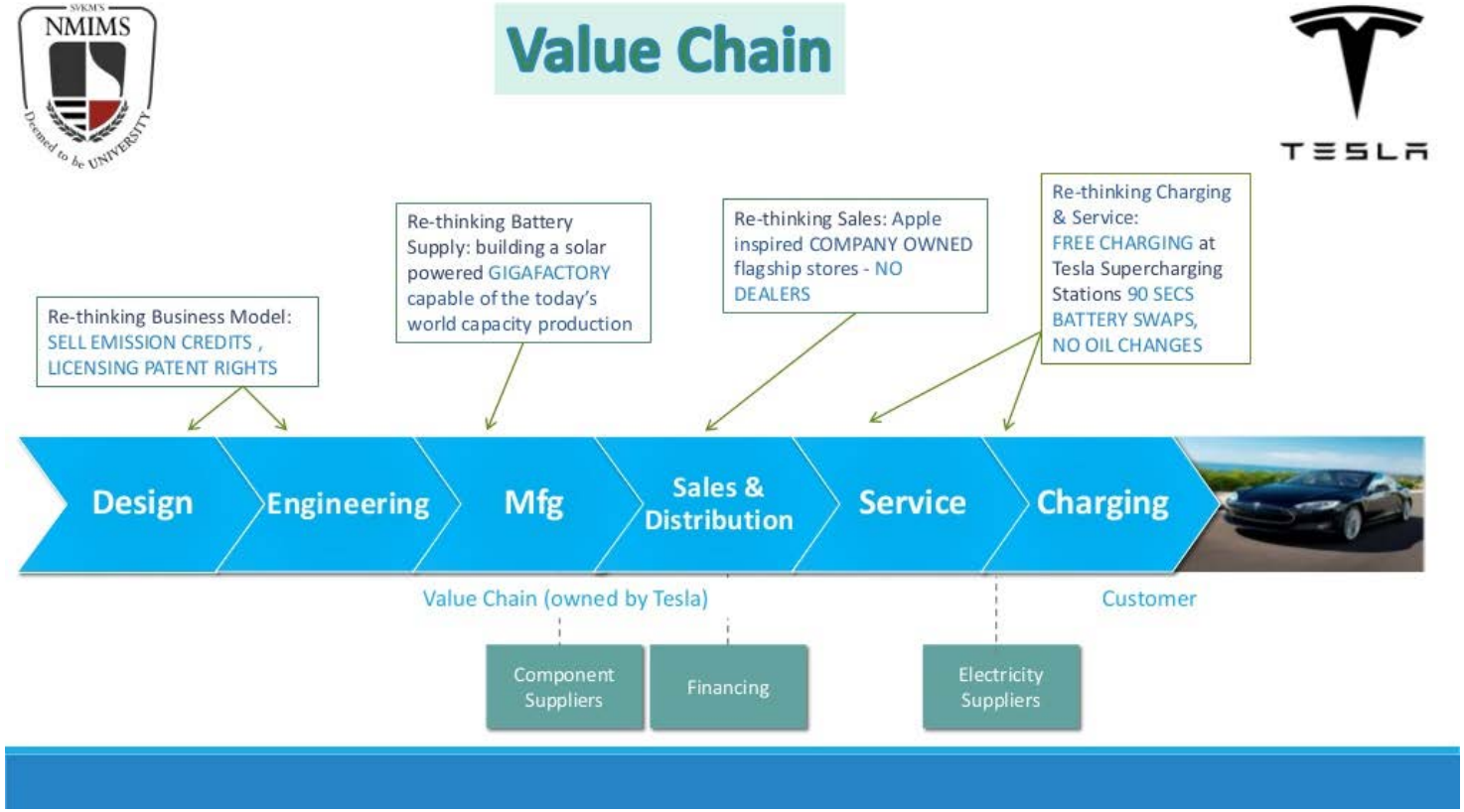
Business Strategy

The Business Model Canvas (Osterwalder, 2009)

Key Partners 	*Key Activities* 	*Value Proposition* 	*Customer Relationships* 	*Customer Segments* 
	Key Resources 		*Channels* 	
Cost Structure 		*Revenue Streams* 		

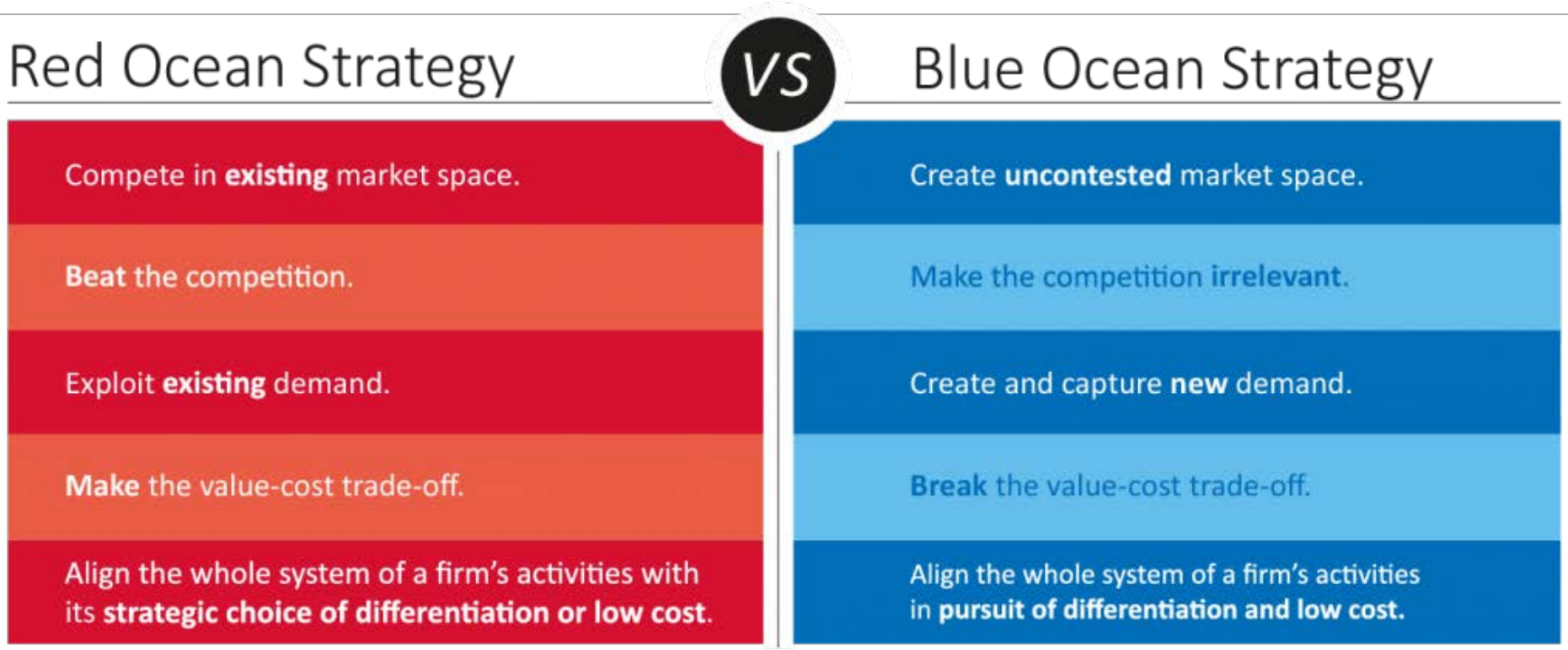
Value Innovation

- Product must deliver value to be useful (Levy, Chapter 1)
- Value chain (Porter), the chain of activities that allows an organization to provide value



https://www.slideshare.net/chetanpalta/tesla-value-chain-presentation

Blue Ocean Strategy



- Example: Airbnb

https://successfulculture.com/your-experience-is-your-blue-ocean-strategy/

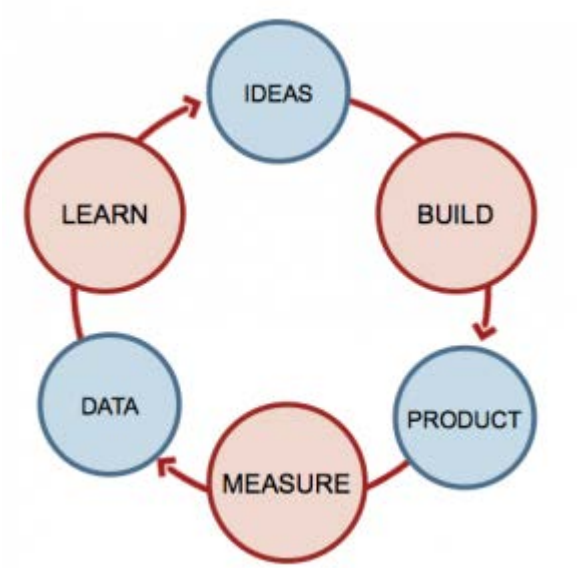
https://www.blueoceanstrategy.com/what-is-blue-ocean-strategy/

(W. Chan Kim and Renée Mauborgne)

Validated User Research

- Can use traditional means:
  - Field studies, focus groups, eye-tracking, personas, etc.
  - i.e., very similar to Elicitation, as we've covered
- Levy recommends:
  - Lean Startup: Confront your users early and often
    - Build-measure-learn feedback loop

http://thestartupmag.com/lean-start-up/



  - Minimum Viable Product: create the minimum product you can release
    - This is very similar to an agile way to thinking

“Killer” UX

- Killer UX designers guide the value innovation of a product in the following ways:
  - Work collaboratively with stakeholders
  - Help determine key moments and features critical to product, primary utility
  - Learn everything about existing marketplace to identify UX opportunities
  - Talk directly to potential users to validate primary utility
  - Weave UX through all touchpoints in a process that is frictionless
    - Example: Airbnb (again), Uber, process starts on web, moves to the physical world, then goes back to the web to write reviews

Our Plan

- In the UX part of our course we focus on two main topics
  - UX Design (Week 1, next week)
    - Prototypes
    - UX Design Patterns (Tidwell Book)
  - Usability and Usability Testing (Week 2, week after next week)
    - How to test if what you've designed is actually usable

- A2 has some UX Design
- A3 has more UX Design and Usability Testing

User (UX) Research

- Product research, Similar to Market Research

- "The main goal of design research is to inform the design process from the perspective of the end user. It is research that prevents us from designing for one user: ourselves."

- At the start of the project, design research is focused on learning about project requirements from stakeholders, and learning about the needs and goals of the end users.
  - Researchers will conduct interviews, collect surveys, observe prospects or current users, and review existing literature, data, or analytics.

- Then, iteratively throughout the design process, the research focus shifts to usability and sentiment.
  - Researchers may conduct usability tests or A/B tests, interview users about the process, and generally test assumptions that will improve the designs.

http://www.uxbooth.com/articles/complete-beginners-guide-to-design-research/

UX Research vs. RE Elicitation

Requirements Elicitation

- Documentation
- Data Sampling
- Interviews
- Surveys/Questionnaires
- Focus groups
- Prototyping
- Participant Observation
- Think aloud protocol
- Models
- Scenarios
- Personas
- Social Media

UX Research

- System analytics
  - User flows
  - User analytics
- Surveys
- Tree Jacking
  - Tests navigation
- Eye tracking
- A/B Testing (Nunally & Farkas)
- Card sorting
- Customer feedback
- Landscape analysis
  - Look at competitors
- Usability heuristics
- Contextual inquiry
  - Observations
- Product testing and validation

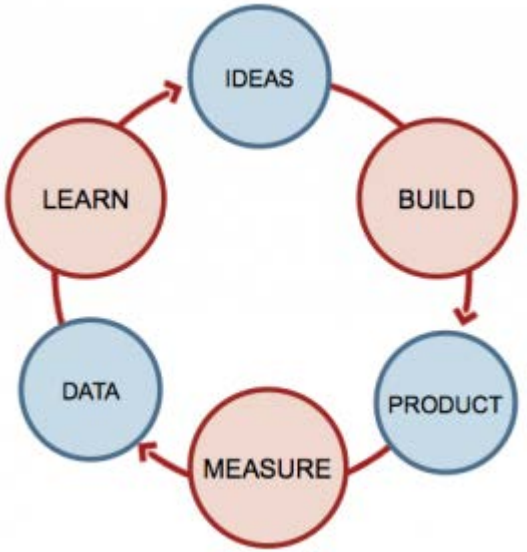
UX Research vs. RE Elicitation

Requirements Elicitation

- Usually assumes there is no existing product
- Or the new product will be radically different
  - Less emphasis on system analytics (as there is no system)
- Traditionally stops when the system is built

UX Research

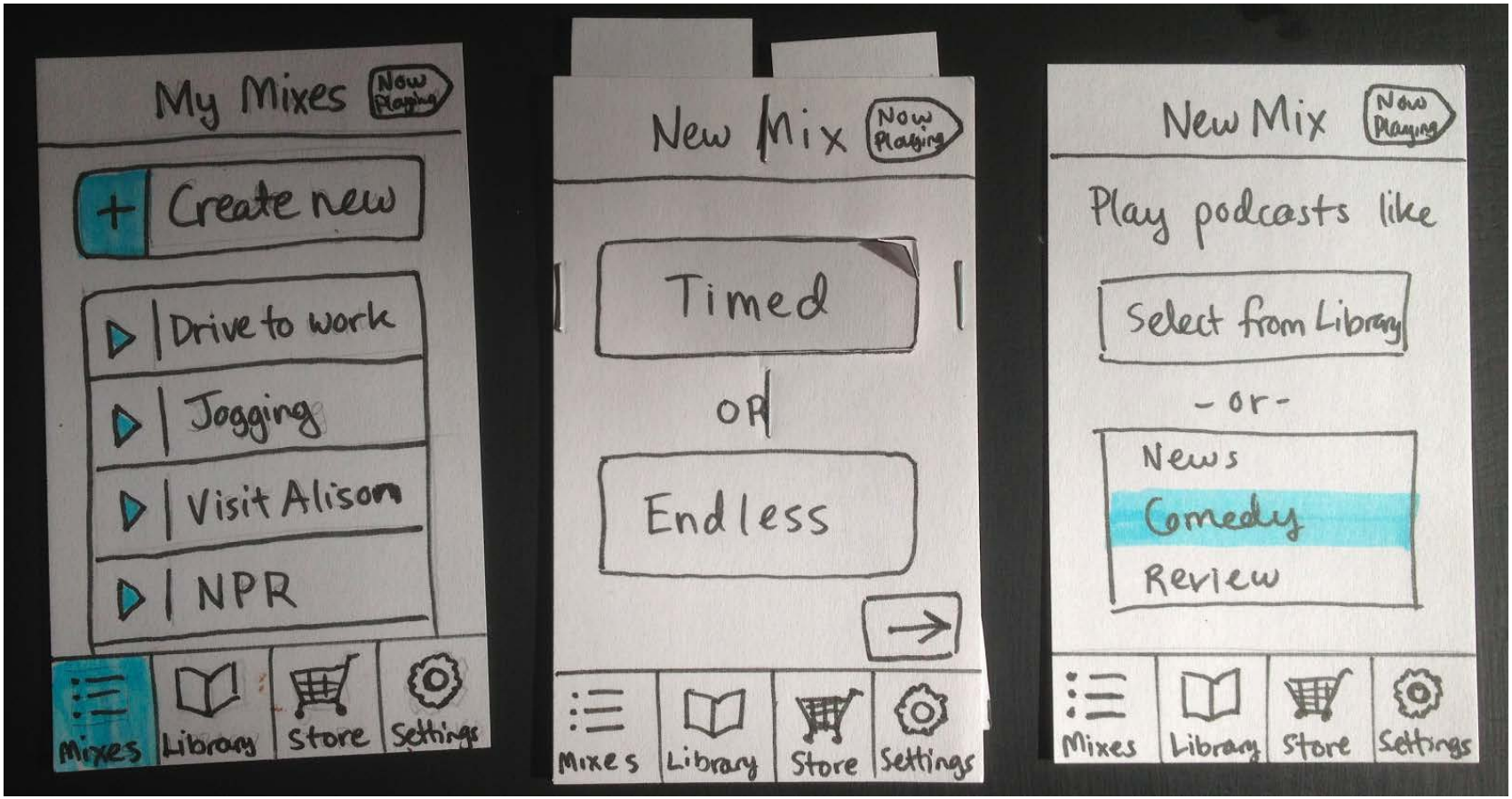
- Assumes there is an existing product to measure
- Continues after the system has been built



Prototyping

Prototyping

- Making a “mock-up” design of your interface



https://www.uxpin.com/studio/blog/what-is-a-prototype-a-guide-to-functional-ux/

Approaches to Prototyping

- Prototyping "A software prototype is a partial implementation constructed primarily to enable customers, users, or developers to learn more about a problem or its solution." [Davis 1990]
- "Prototyping is the process of building a working model of the system" [Agresti 1986]
- Approaches to prototyping (Easterbrook)
  - Presentation Prototypes
    - used for proof of concept; explaining design features; etc.
    - explain, demonstrate and inform – then throw away
  - Exploratory Prototypes
    - used to determine problems, elicit needs, clarify goals, compare design options
    - informal, unstructured and thrown away.
  - Breadboards or Experimental Prototypes
    - explore technical feasibility; test suitability of a technology
    - Typically no user/customer involvement
  - Evolutionary (e.g. "operational prototypes", "pilot systems"):
    - development seen as continuous process of adapting the system
    - "prototype" is an early deliverable, to be continually improved.

Throwaway or Evolve? (Easterbrook)

Throwaway Prototyping

- Purpose:
  - to learn more about the problem or its solution…
  - discard after desired knowledge is gained.
- Use:
  - early or late
- Approach:
  - horizontal - build only one layer (e.g. UI)
  - "quick and dirty"
- Advantages:
  - Learning medium for better convergence
  - Early delivery → early testing → less cost
  - Successful even if it fails!
- Disadvantages:
  - Wasted effort if reqts change rapidly
  - Often replaces proper documentation of the requirements
  - May set customers' expectations too high
  - Can get developed into final product

Brooks: "Plan to throw one away - you will anyway!"

Evolutionary Prototyping

- Purpose
  - to learn more about the problem or its solution…
  - …and reduce risk by building parts early
- Use:
  - incremental; evolutionary
- Approach:
  - designed to be extended/adapted
- Advantages:
  - Requirements not frozen
  - Return to last increment if error is found
  - Flexible(?)
- Disadvantages:
  - Can end up with complex, unstructured system which is hard to maintain
  - early architectural choice may be poor
  - Optimal solutions not guaranteed
  - Lacks control and direction

Types of Prototypes

- Paper
  - Advantages: fast, inexpensive, (can be fun), concrete
  - Disadvantages: unrealistic, distracting, awkward
- Digital
  - Advantages: fast, more realistic, flexible (can change)
  - Disadvantages: have to learn software, doesn't transition to code
- HTML
  - Advantages: can test on any device, technical foundation, shortcut
  - Disadvantages: hard to make (need to code), inhibits creativity

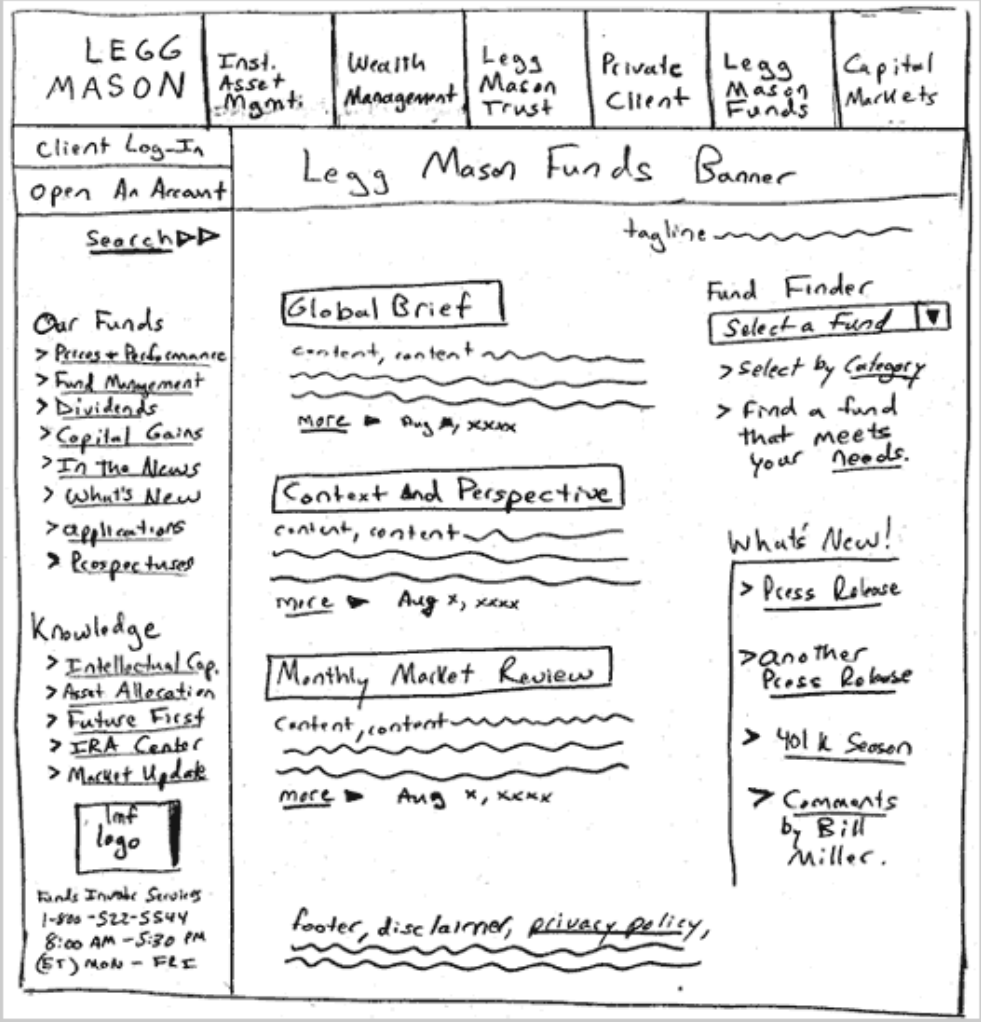
https://www.uxpin.com/studio/blog/what-is-a-prototype-a-guide-to-functional-ux/

Paper Prototypes

- Draw screens on paper
- When the user “clicks” or “selects” something you manually trigger the action:
  - Open a new “screen” (new paper)
  - Add on a menu (with more paper)
  - Etc.
- Dynamic and movable
- Don’t have to be perfectly drawn, but should be neat and understandable
- Helpful video (advertising for a different course :p):
  - https://www.lynda.com/User-Experience-tutorials/What-paper-prototyping/534422/577191-4.html

Example

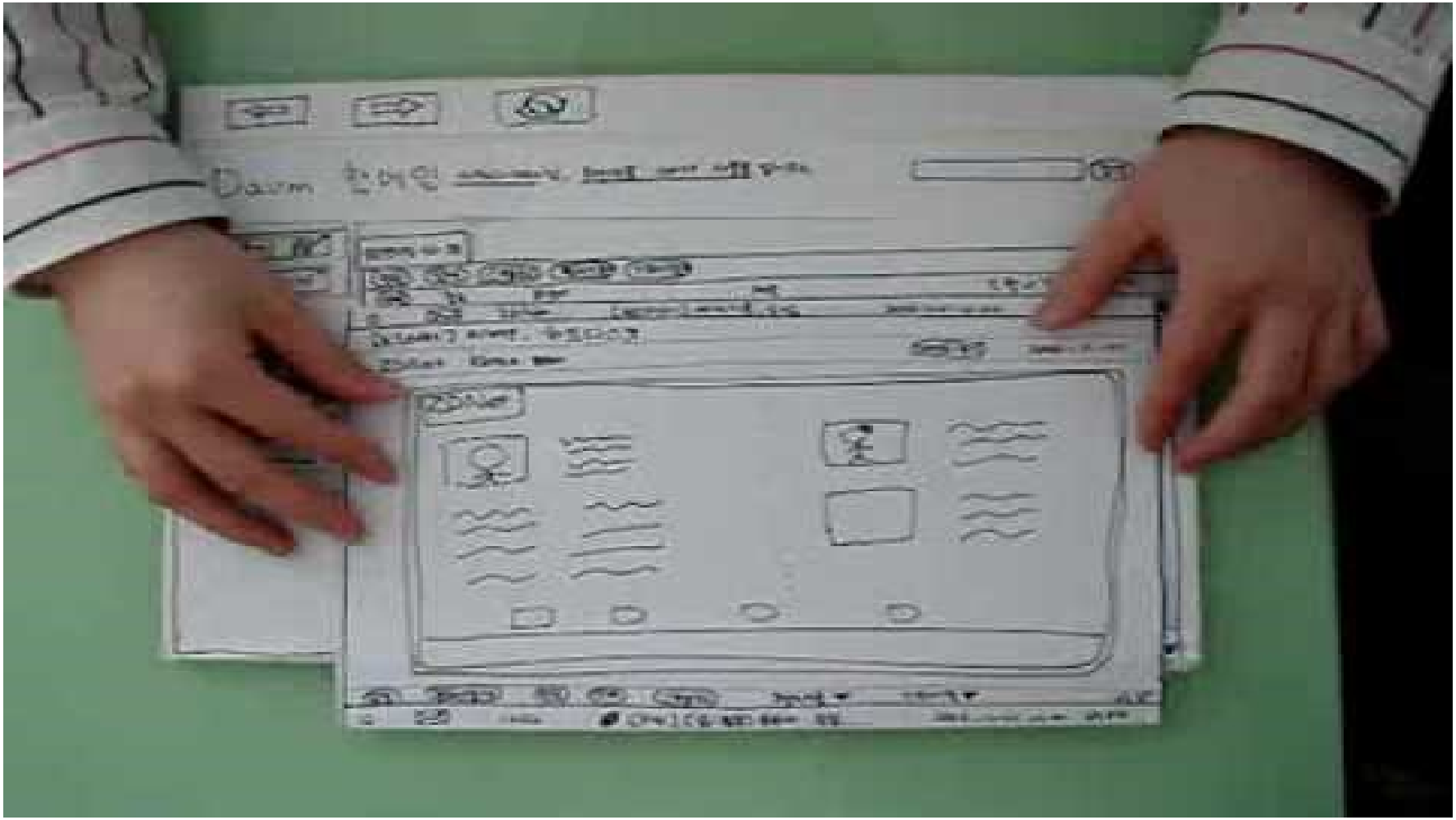
Paper Prototype for leggmasonfunds.com landing page



If the user pointed to the "Fund Finder" drop down menu, the full menu (below) would be presented.

http://conorogohagan.blogspot.se/2010/10/paper-prototyping.html

Another example



https://www.youtube.com/watch?v=GrV2SZuRPv0

Digital Prototypes

- Make a digital picture which looks like your UI design
- Could have dynamic elements
  - E.g., “real” buttons which move you to the next screen
  - But no code
- Tools
  - Powerpoint
  - Visio (not free)
  - Balsamiq (30 day cloud trial)
  - Mockingbird (try it for free, for 6 days!)
  - Photoshop (not free)
  - https://moqups.com/ (Free Plan offers 1 project (limited to 300 objects) and 5MB of storage)
  - https://proto.io/ (15 day full featured trial)

Example (early Creative Leaf)

Creativity Activities

Preparation

- Context Diagram: Actor Identification
- Context Diagram: Data Flows
- Customer Journey Map
- i* Strategic Dependency Diagram
- i* Simple Strategic Rationale Diagram
- Check Differences
- i* Full Strategic Rationale Diagram

Transformation

- Context Diagram Transformation
- Journey Map Transformation
- Hall of Fame
- Assumption Busting

Exploration

- Negative Brainstorming
- why? why? why? why? why?
- Role Play

Combination

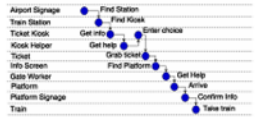
- Pair-wise Comparison

Evaluation

- i* Analysis

Creative Outputs

Context Diagram
(Open on Drive with Draw.io Pro)



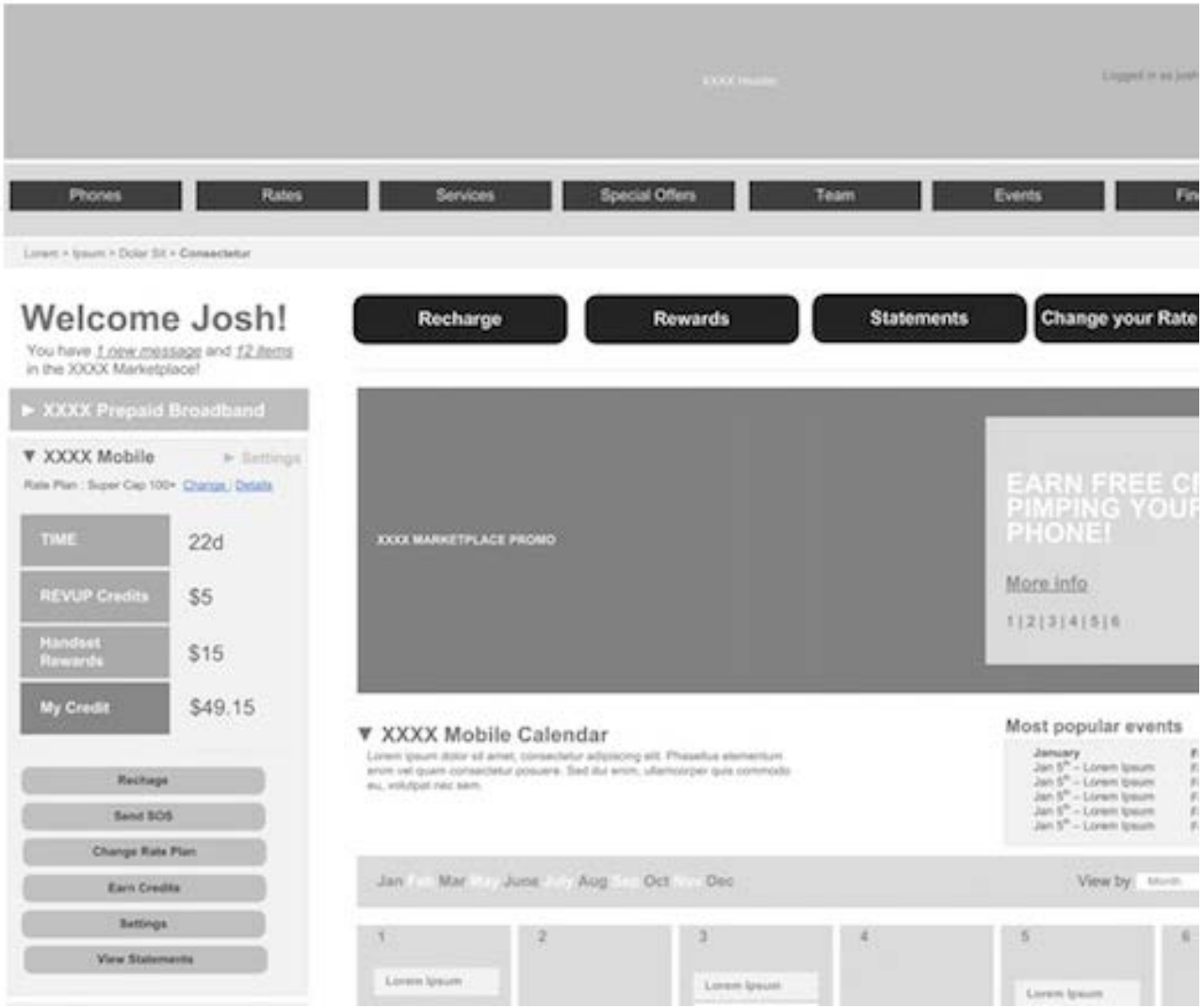
Customer Journey Map
(Open on Drive with Draw.io Pro)

i* Strategic Dependency Model

i* Strategic Rationale Model

Unmodelled Ideas

Another Example



http://www.pfnp.me/how-to-choose-a-wireframing-tool/

Wireframes vs. Prototypes

- Very similar
- (According to source) Prototypes are more complete, wireframes more rough
- Wireframes don't get into design aesthetics (things don't yet look pretty or slick) just basic function and actions
- Prototypes mimic final product, without underlying code.
- …
- But what about paper prototypes?

https://www.webpagefx.com/blog/web-design/wireframes-vs-prototypes-difference/

Questions?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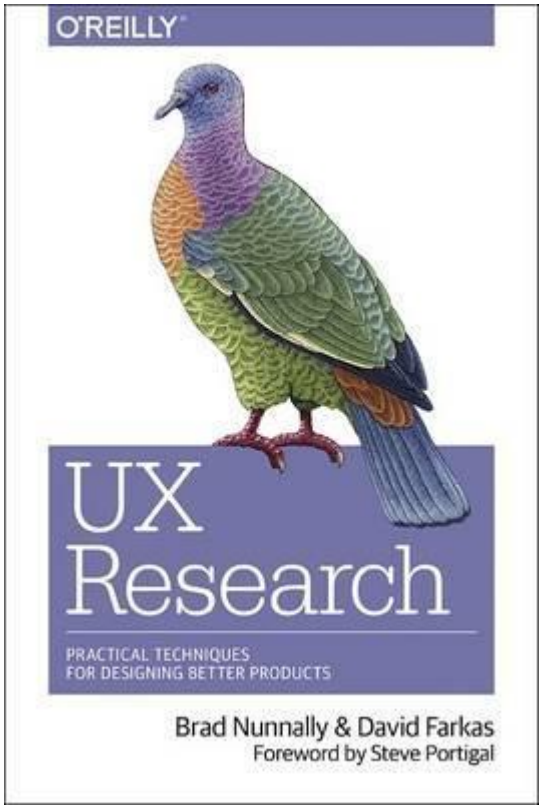
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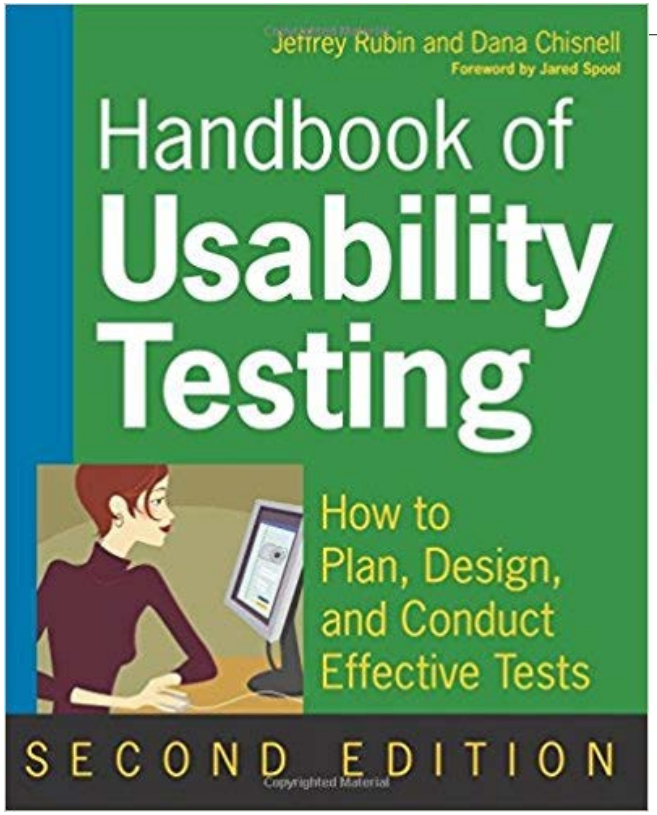
Brad Nunnally & David Farkas
Foreword by Steve Portigal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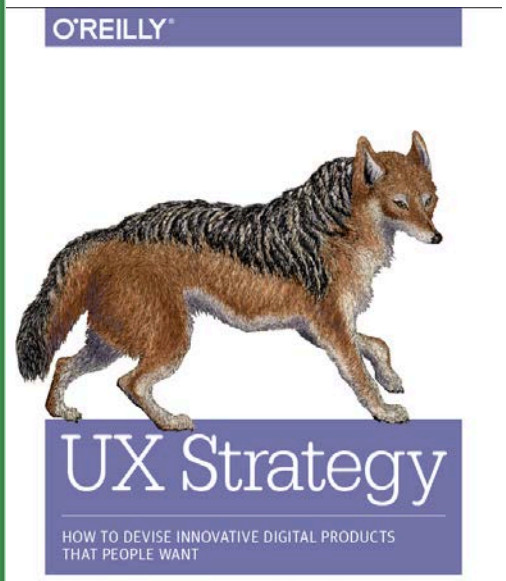
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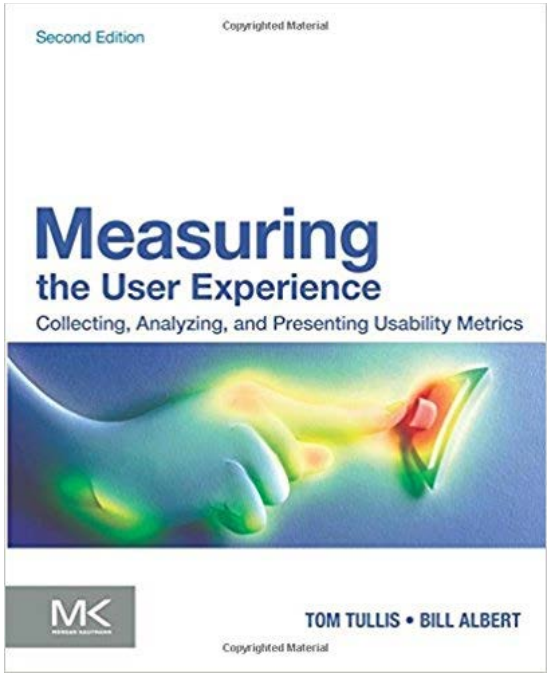
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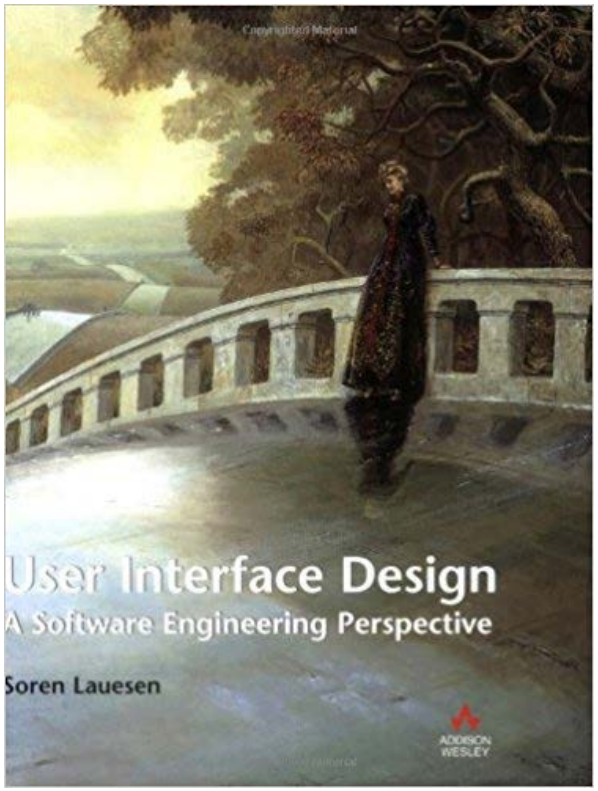
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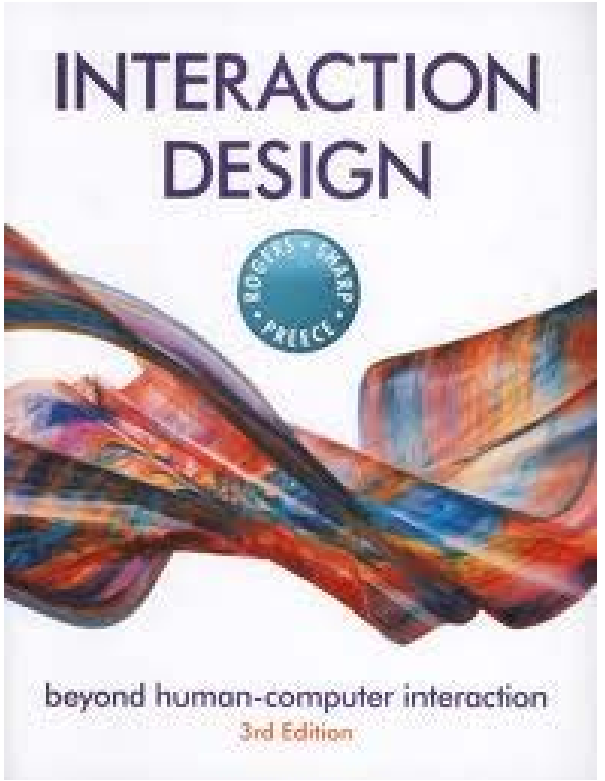
Soren Lauesen
ADDISON WESLEY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