

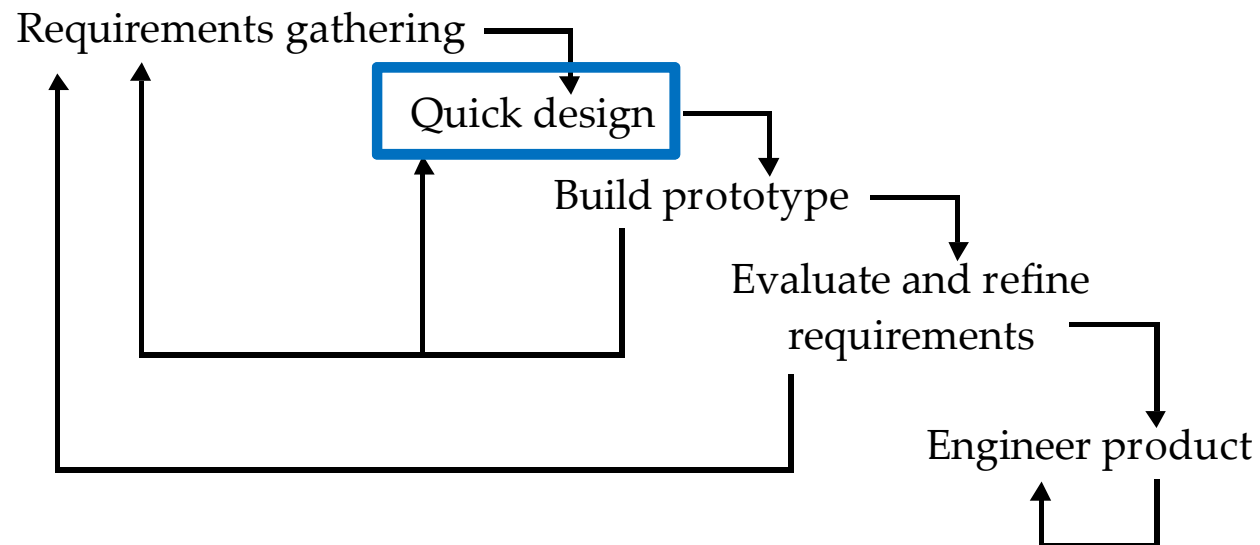
Interaction Design



Design Process & Prototyping

Interaction Design

- **Iterative** user centered design and development



This Lecture

- Participatory design
 - Characteristics
 - Principles & Activities
 - Low fidelity and high fidelity [prototyping](#)

Interaction Design: How?

- Aim
 - **How to** optimise the user's interaction with the system / environment, so that it supports and extends the user's activities in **useful**, **efficient**, and **usable** ways ?
- The route
 - **How to** **ensure** that the designed user interface is **a success** ?
 - **How to** **make** the user interfaces **task- & user-profiled** ?
 - **How to** **involve the users** in the design process ?



User-Centred Design = Participatory Design

Participatory Design

- Developed in Scandinavia
- Aims to keep the whole process of developing a system **user centred**
 - Include users in the design team
 - Rather than treating them as subjects of analysis who remain outside the core design situation
- **Motivation**: users are experts on their work situation

PD Characteristics

- Three main characteristics:
 - **Work focussed** – design concentrates on improving the workers' environment and tasks they perform rather than focussing on the system requirements
 - **Collaborative** – the designers and users collaborate on the design so that the users can contribute at every stage
 - **Iterative** – design does not just happen once, the emphasis of participatory design is on several design and evaluation stages which build to a final design

design → **measure** (against the requirements) → **test** (with users) → **redesign**



Participatory Design: Process

- PD needs to employ various techniques and models to **communicate ideas** between users and designers:
 - Brainstorming
 - Concept development
 - Prototyping
 - Storyboarding
 - Workshops



Participatory Design: Activities

- Identify functionality and usability needs / requirements
- Develop **alternative designs** that meet those needs
- Build **interactive versions** of the designs
- Evaluate

Participatory Design: Activities

- Develop **alternative designs** that meet the identified needs and requirements
 - **design**: suggesting ideas for meeting the identified requirements
 - **conceptual design**:
 - what the product/system will do
 - how the product/system will behave
 - **physical design**:
 - details of the design such as screen and menu structures, icons, and graphics, I/O devices, interaction types / styles
- Alternative designs will **differ in physical design**, but conceptual design will be the same

Conceptual vs. Physical Design: Example

- Conceptual design **abstractly** describes system's **intended behavior**
- Physical design addresses **specific, concrete layout** and **design issues**

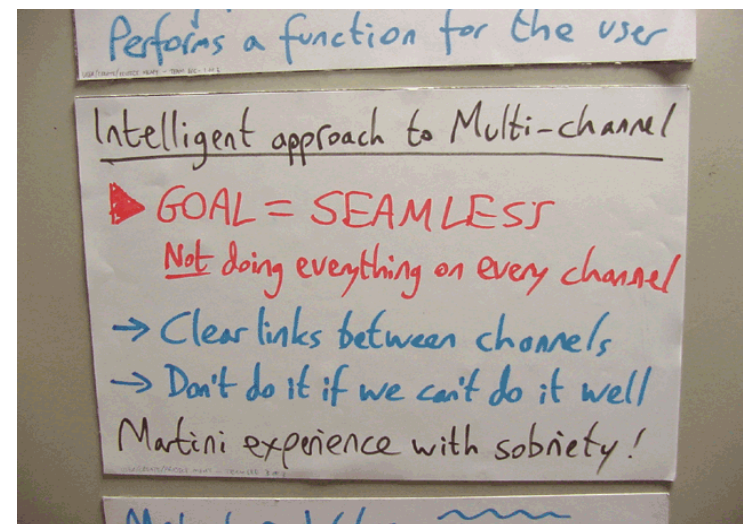
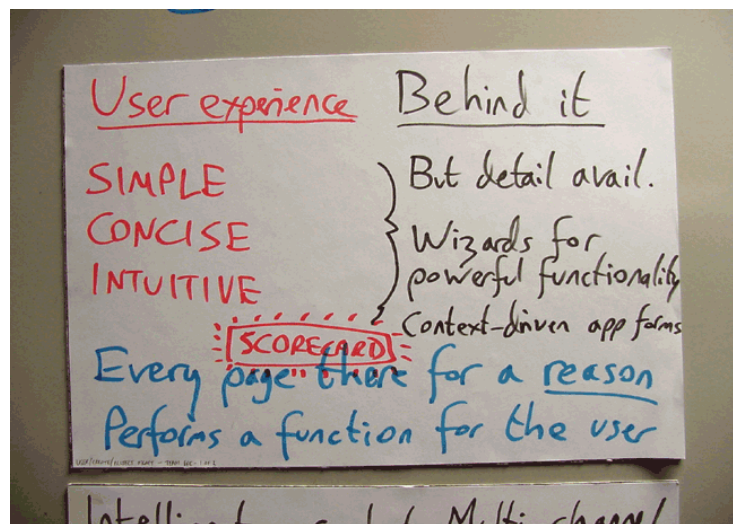
QUESTION

- Consider an **ATM**
 - Describe its conceptual design
 - Describe its physical design



Develop Alternative Designs

- Brainstorming
 - Users and designers generate a range of ideas
 - Developed without judgement
 - Ideas then feed into other techniques to be developed further or dropped



Concept Development

- A **conceptual model** is:
 - “...a high-level description of how a system is organized and operates”
(Johnson and Henderson, 2002, p26)
- Enables
 - “...designers to straighten out their thinking before they start laying out their widgets”
(Johnson and Henderson, 2002, p28)

Concept Development

- What is the **driving concept** or **metaphor** behind the design?
 - This drives design decisions
 - graphic design decisions
 - colours
 - fonts
 - layouts
 - ...
- You need one **strong** concept/ metaphor to make a **coherent design**

Interface Metaphors

- Conceptualizing what we are doing
 - e.g. surfing the web
- A conceptual model instantiated at the interface
 - e.g. the desktop metaphor
- Visualizing an operation
 - e.g. an icon of a shopping cart for placing items into

Concept Development

- Verbal

- might be words you use to describe the interface
 - verbal concepts tend toward the **abstract**
 - they are focused on the **message** your design is to communicate

- Visual

- might be a specific image or colour scheme
 - visual concepts tend to be more **concrete**
 - visual concepts are focused more on the **how** of conveying your message

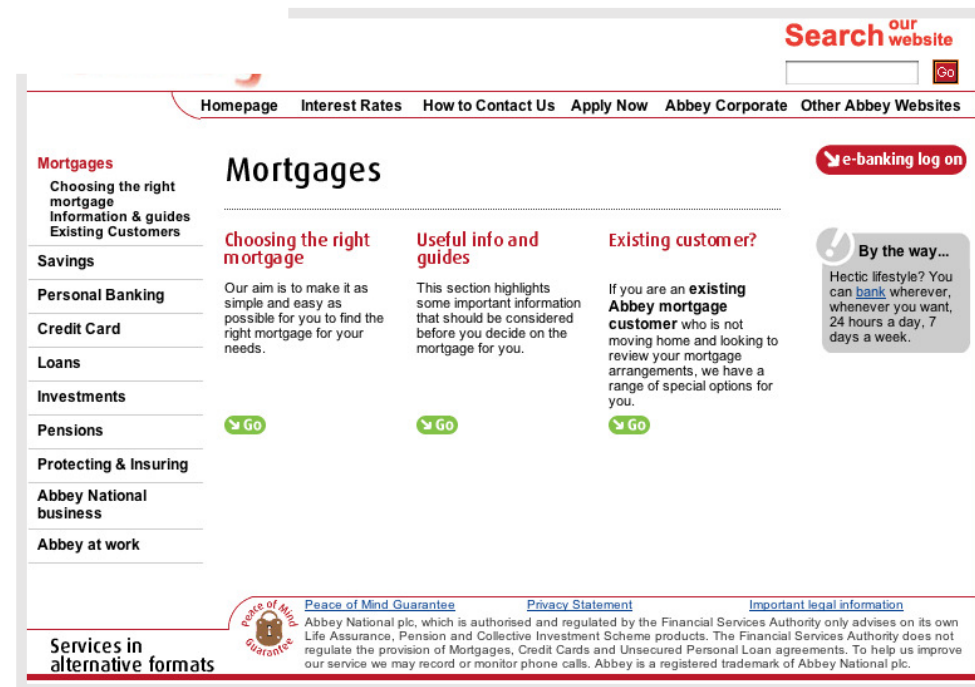
Mood Board

- A type of collage consisting of
 - images
 - text
 - samples of objects in a composition of the choice of the creator
- Designers and others use mood boards to develop their design concepts and to communicate to other members of the design team

Design Concept & Mood Board: Example

QUESTION

- Develop 3 different **design concepts** for a financial management interface based on the following metaphors:
 - Memory
 - Organic
 - Learning



DISPOSABLE CAMERA

"SOLID CORE OF INFORMATION,
WITH INTERCHANGEABLE CONTENT
OBJECTS"



snapshot

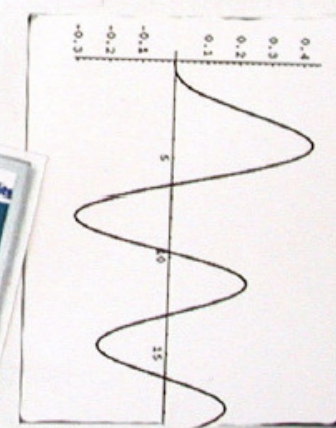


instant
memory

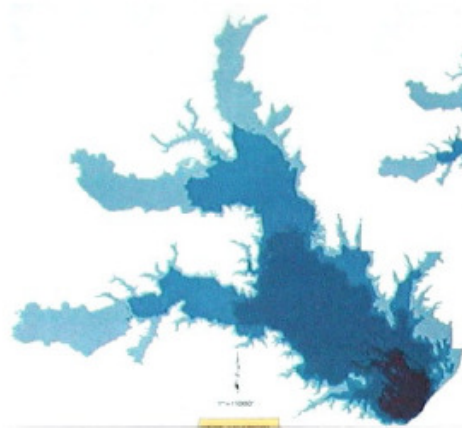
save safe



reminder

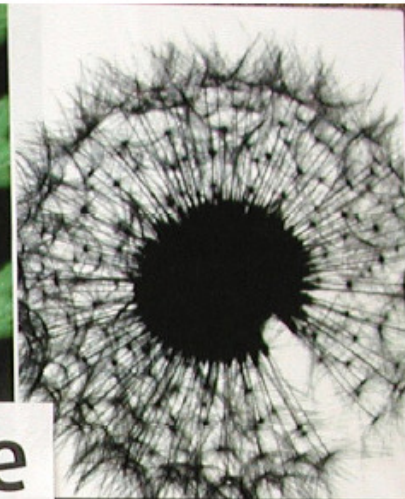


personal
history



organic

depth



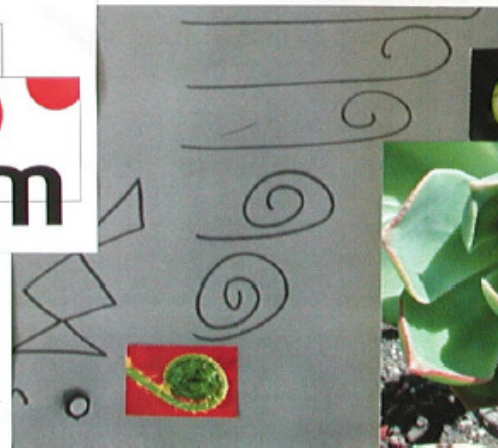
reproduce



structure



zoom



navigation



Build Interactive Versions of the Design

- Best evaluation of alternative designs \Leftrightarrow let the users interact with these designs
- “Interactive version” of a design \neq software version of the design
- Prototyping
 - an **incomplete**, early version of a product
 - a prototype can be as **simple** as a drawing on a piece of paper or as **complex** as a web application
 - or anywhere in between those extremes



Prototyping: Why?

- Sketch – explore a design space through multiple iterations / variations
 - Interaction
 - Form
 - Technology
 - Concepts
 - Content



Prototyping: Why?

- Demo a concept to:
 - Yourself
 - Group members
 - Client
 - Funder
 - ...



Prototyping: Why?

- Develop design
 - Test concepts / assumptions / ideas
 - Find how it should work in real life
 - Thinking through making
 - Identify and prioritize most important features
 - Choose between alternatives

Prototyping: Why?

- User testing – different from interviewing
 - Get more objective feedback – designer/developer is biased!
 - How do people actually perceive it and use it?
 - Does it address needs?
 - Identify opportunities and problems



Prototyping: What?

- Technical aspects
- Workflow, task design
- Screen layouts and information display
- Graphic design, look-and-feel
- Content
 - e.g. taxonomy of objects/widgets, etc.
- Controversial or critical areas
 - e.g. security and privacy issues

Kinds of Prototypes

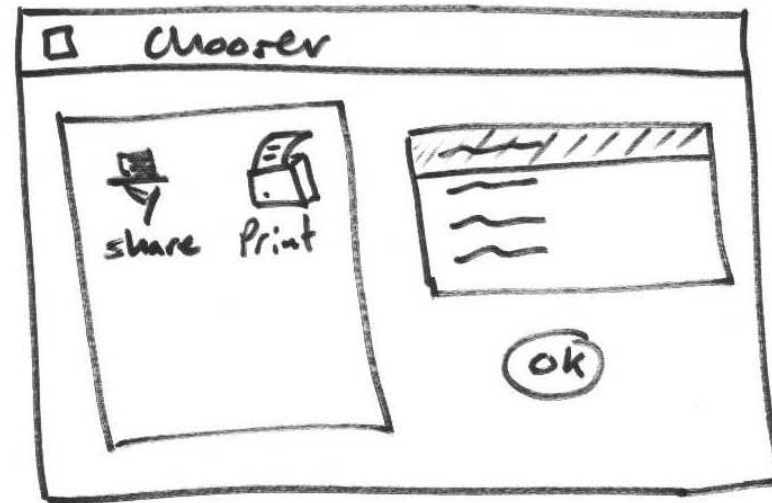
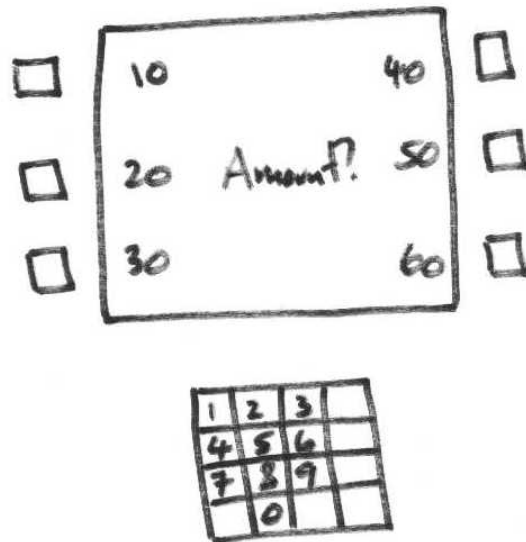
- Low fidelity ↔ High fidelity
 - Lo-fi vs. Hi-fi
 - Fast → low fidelity
 - Slow → high fidelity

Low Fidelity Prototyping

- Typically, **rough** designs are drawn
 - *i.e.* possible designs are modelled using pencil and paper
- Users consider how they **would use** it
 - Move through the design step by step
- **Problems** with the design can be **identified** from trouble the users have as they move through it
- These **problems** can then be **addressed** in the next **iteration** of the design

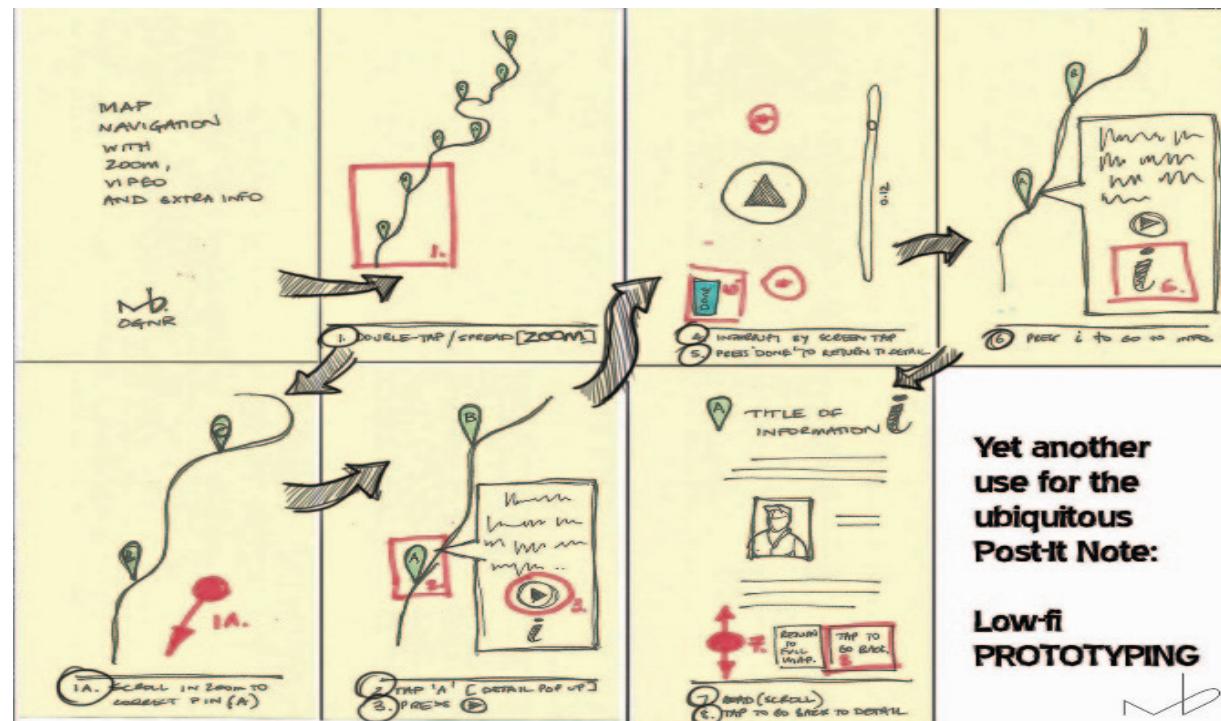
Low Fidelity Prototyping

- Hand drawn designs
- Quick, cheap, easy to change and update
 - Examples: sketches of screens & task sequences, post-it notes, etc.



Lo-fi Prototyping

- Need to detail what each element does and how you interact with it





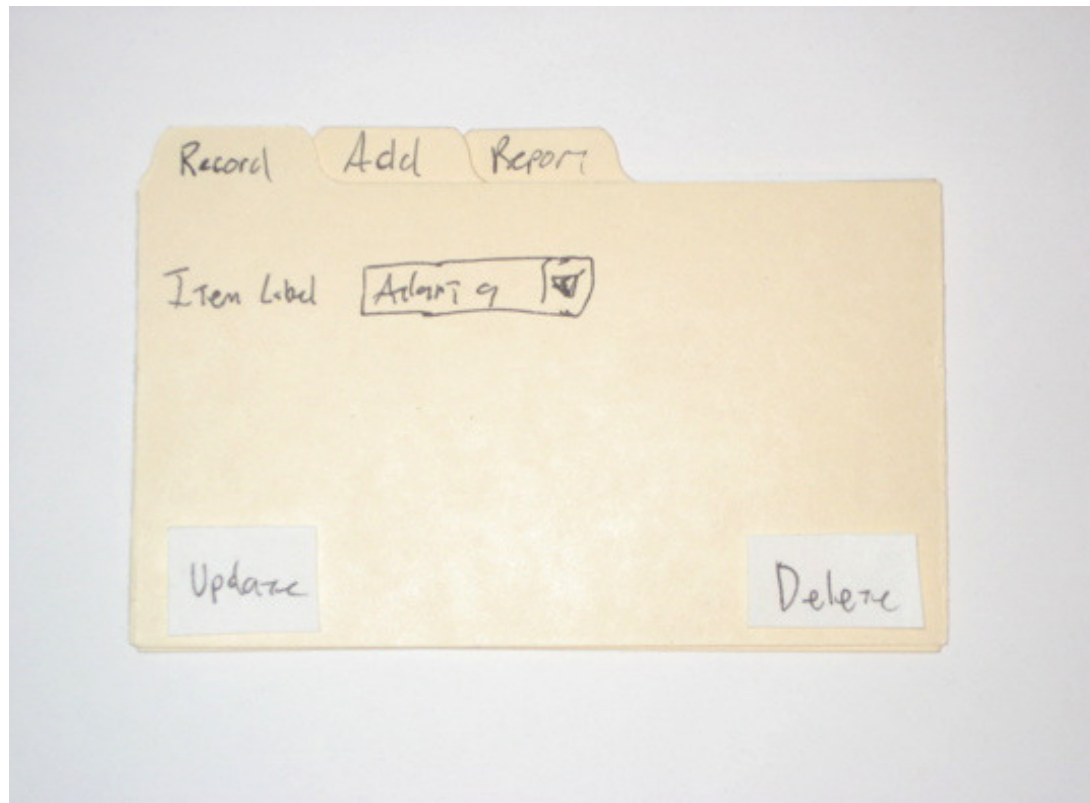
Why is lo-fi prototyping better than hi-fi?



Kinds of Prototypes

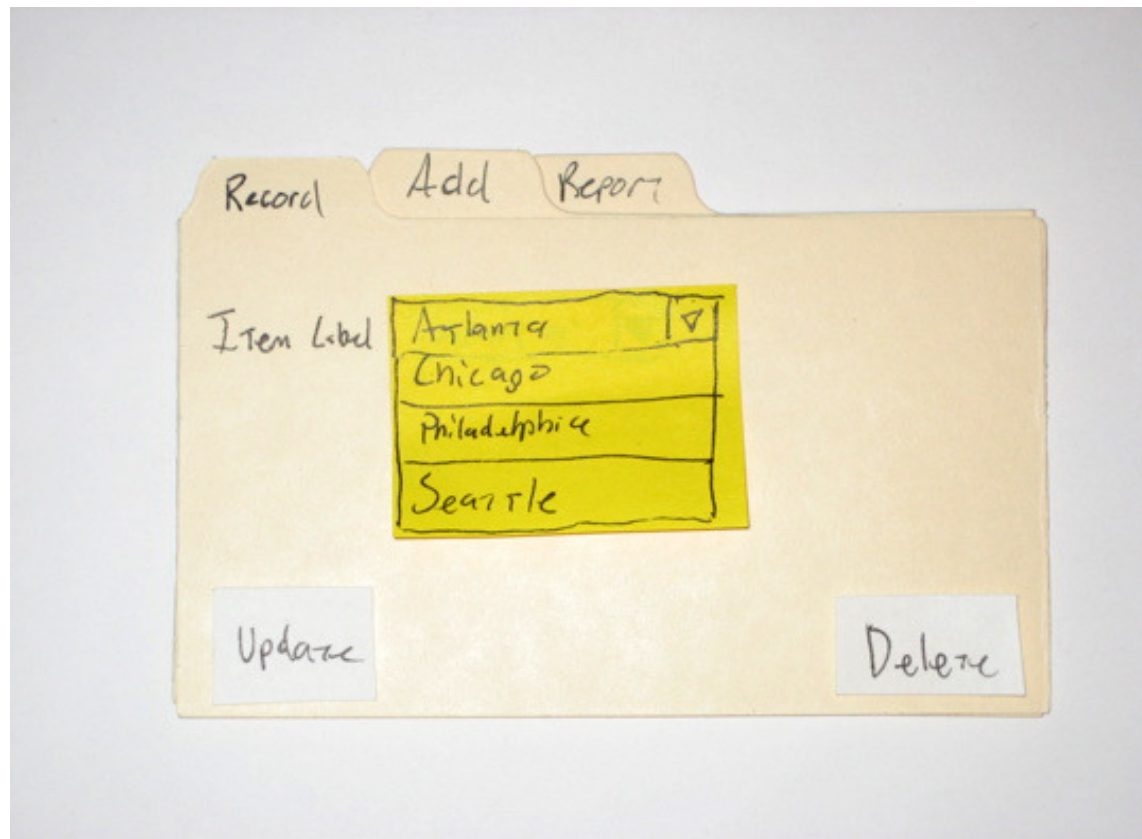
- Paper
 - Drawing, diagram, photoshop, etc.
 - Quick
 - Cheap
 - Sketchy
 - Many iterations / versions

Paper Prototype: Example (1)



Images from: <http://www.alistapart.com/articles/paperprototyping/>

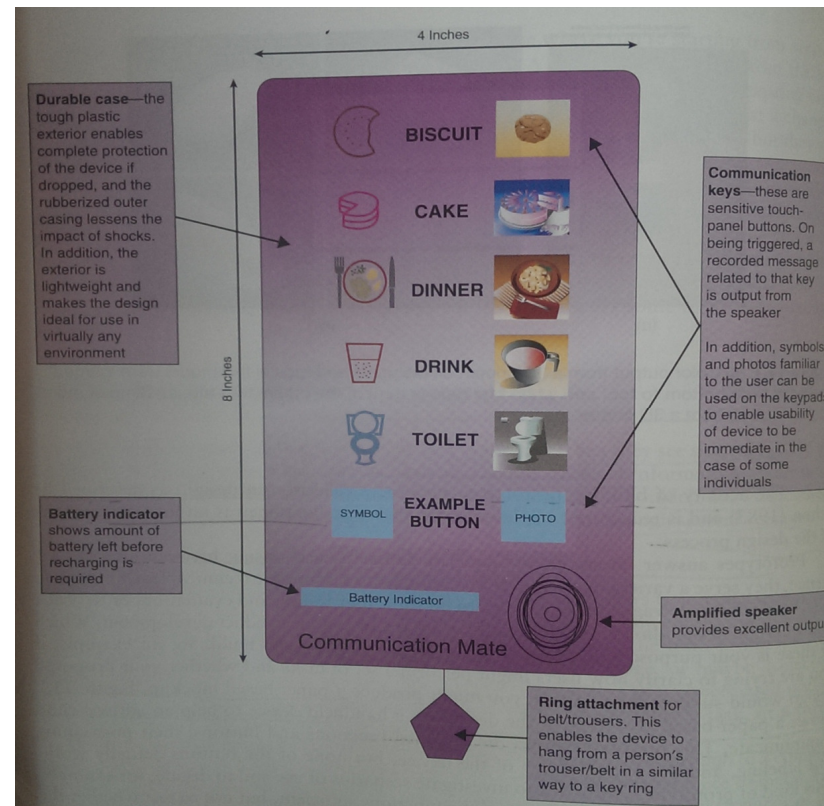
Paper Prototype: Example (2)



Images from: <http://www.alistapart.com/articles/paperprototyping/>

Paper Prototype: Example (3)

- A paper-based prototype of a handheld device to support an autistic child



Kinds of Prototypes

- Video
 - Quick or complicated
 - Sketchy or polished
 - Tells a story
 - Shows people, context, scenario, function, form
 - Demo impossible / costly technologies or situations

Video Prototype: Example

- Beyond the Fold – S. Bettencourt
 - A speculative approach to the **electronic newspaper** of the future
 - It explores gesture as a means to interface with the device and bridge the digital and physical worlds
 - The design process employs cultural metaphors, human experience and rituals to create meaningful interactions
 - Scenario 1
 - <http://vimeo.com/12782691>
 - Scenario 2
 - <http://vimeo.com/12783337>



Kinds of Prototypes

- Form model
 - Does not work but shows form
 - Rough or refined
 - How will object / system be in the world
 - Allows handling the thing directly

Form model: Example

- Jeff Hawkins: Palm co-founder and one of the inventors of the **Palm Pilot** (*one of the first handheld computers*)
 - Before committing to develop the Pilot, Jeff made and carried a **mock-up** (a block of wood) in his pocket for several months

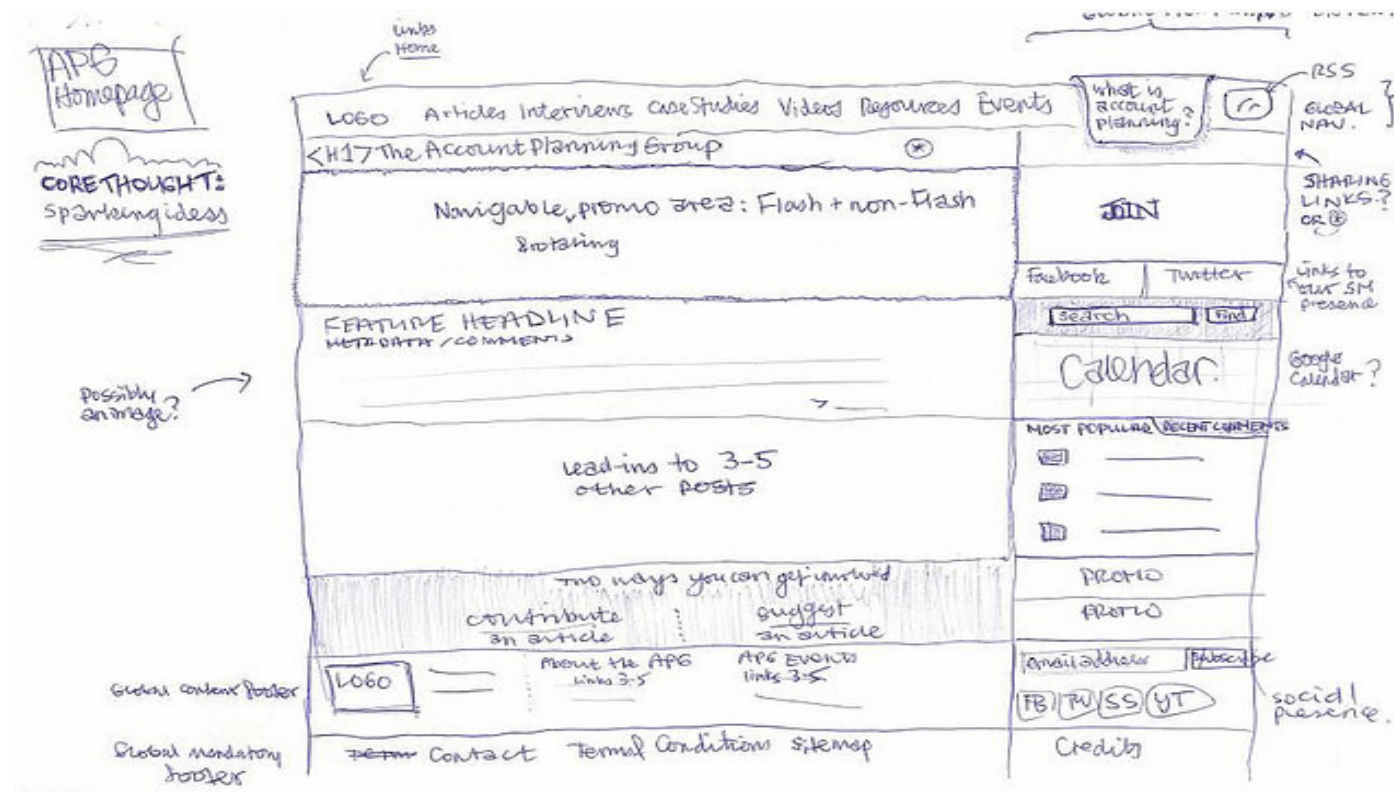


Kinds of Prototypes

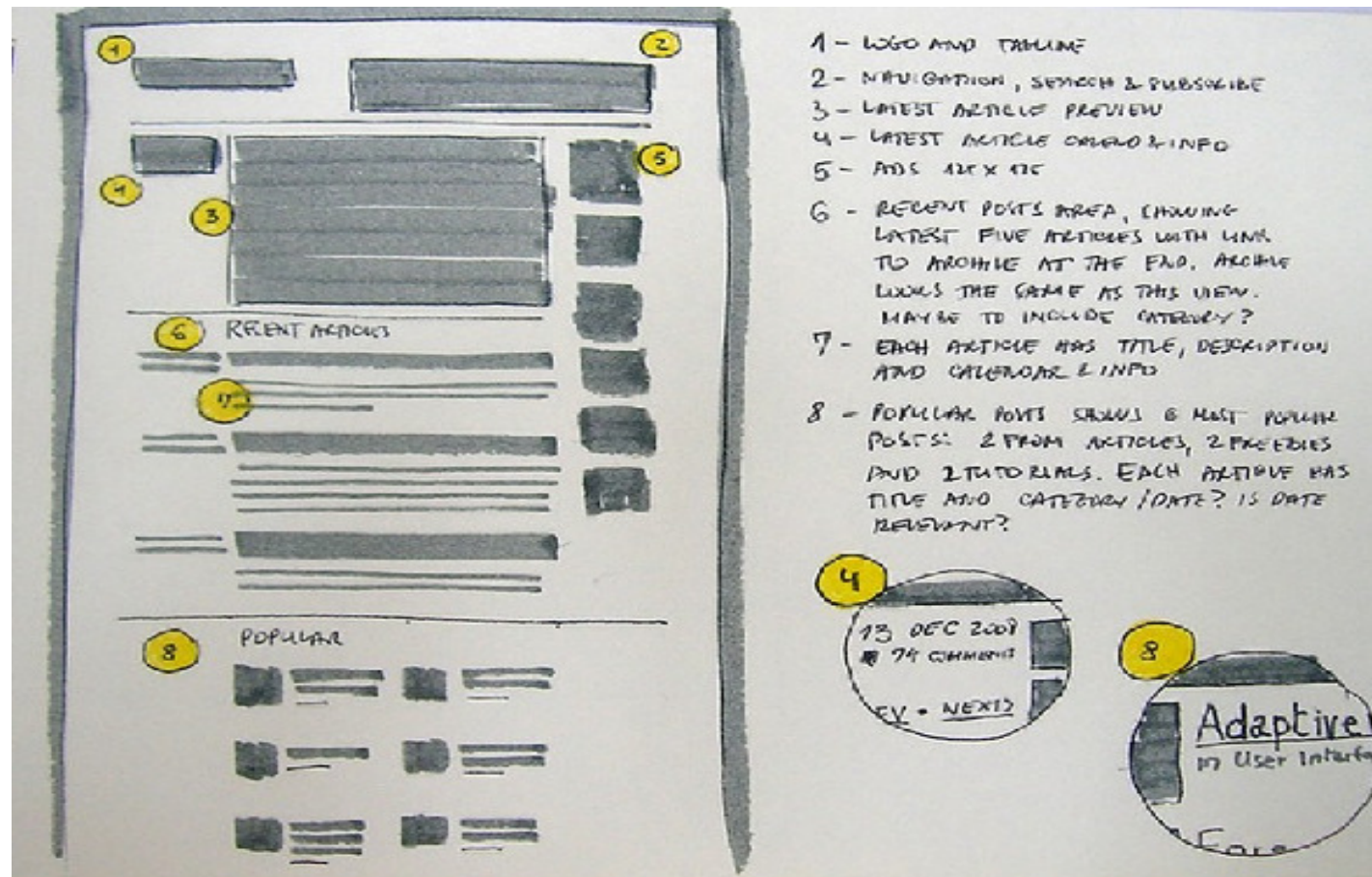
- Wireframe
 - Schematic of information architecture
 - Shows relationships of content/navigation
 - Non-visual design
 - Defines scope

Wireframe: Example (1)

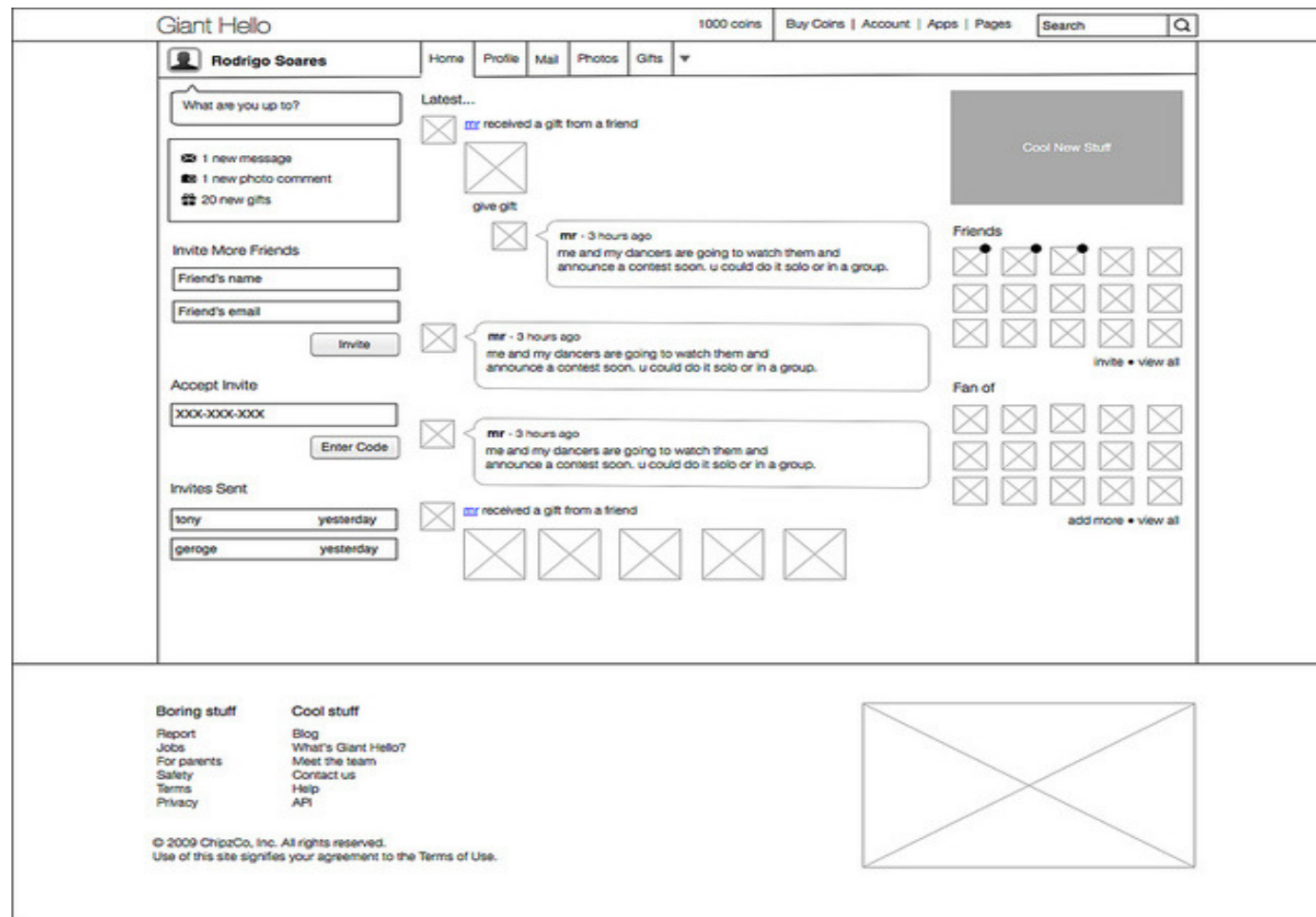
- You don't have to be an artist to draw effective wireframe sketches



Wireframe: Example (2)






Digital Wireframe: Example (1)



Digital Wireframe: Example (2)


Giant Hello

The Social Network for Kids!







Log InSign UpPagesParental Controls

Cool New Games






Farm Ville
Farm Ville is a game where you can farm with your friends





Mall World
The place where you can be your own boss, run your own fashion boutique, and shop to your heart's content.



Sign Up

Choose Username

Password

Re-Type Password

Email (optional)

Birthday


☐ Boy ☐ Girl

Sign Up

What's HotCelebs updates

Boring stuff
Report
Jobs
For parents
Safety
Terms
Privacy

Cool stuff
Blog
What's Giant Hello?
Meet the team
Contact us
Help
API



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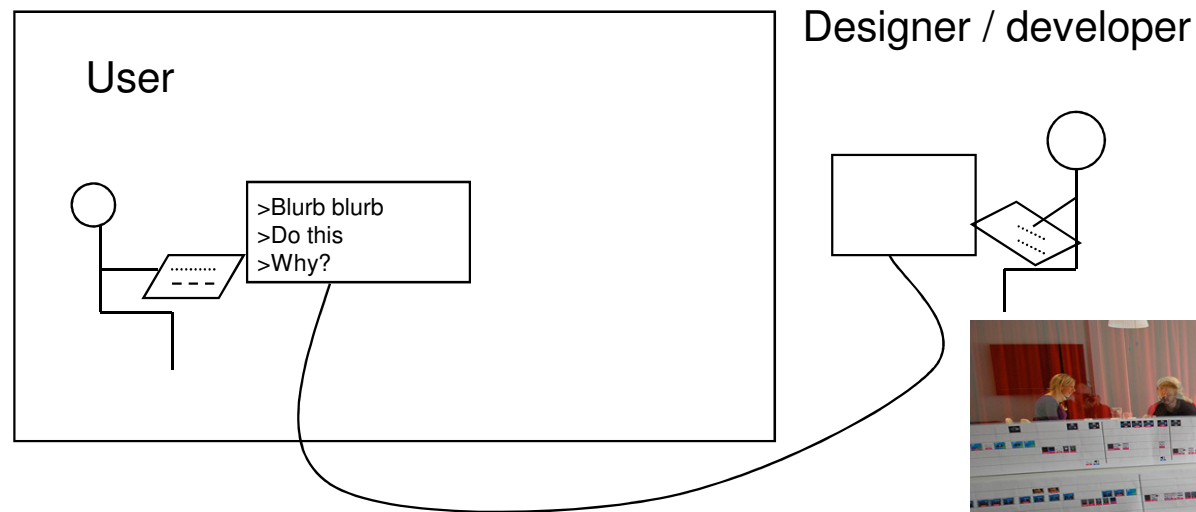


Kinds of Prototypes

- Working prototype
 - Works
 - May be limited in features
 - Shows how actual use plays out
 - Form may not be accurate

Working Prototype: Wizard-of-Oz

- Mock up interactivity
 - It's not the system controlling the interaction, it's the designer / developer (but users believe it is the system!)





Participatory Design

- Brainstorming
- Concept development
- Prototyping
- Storyboarding
- Workshops

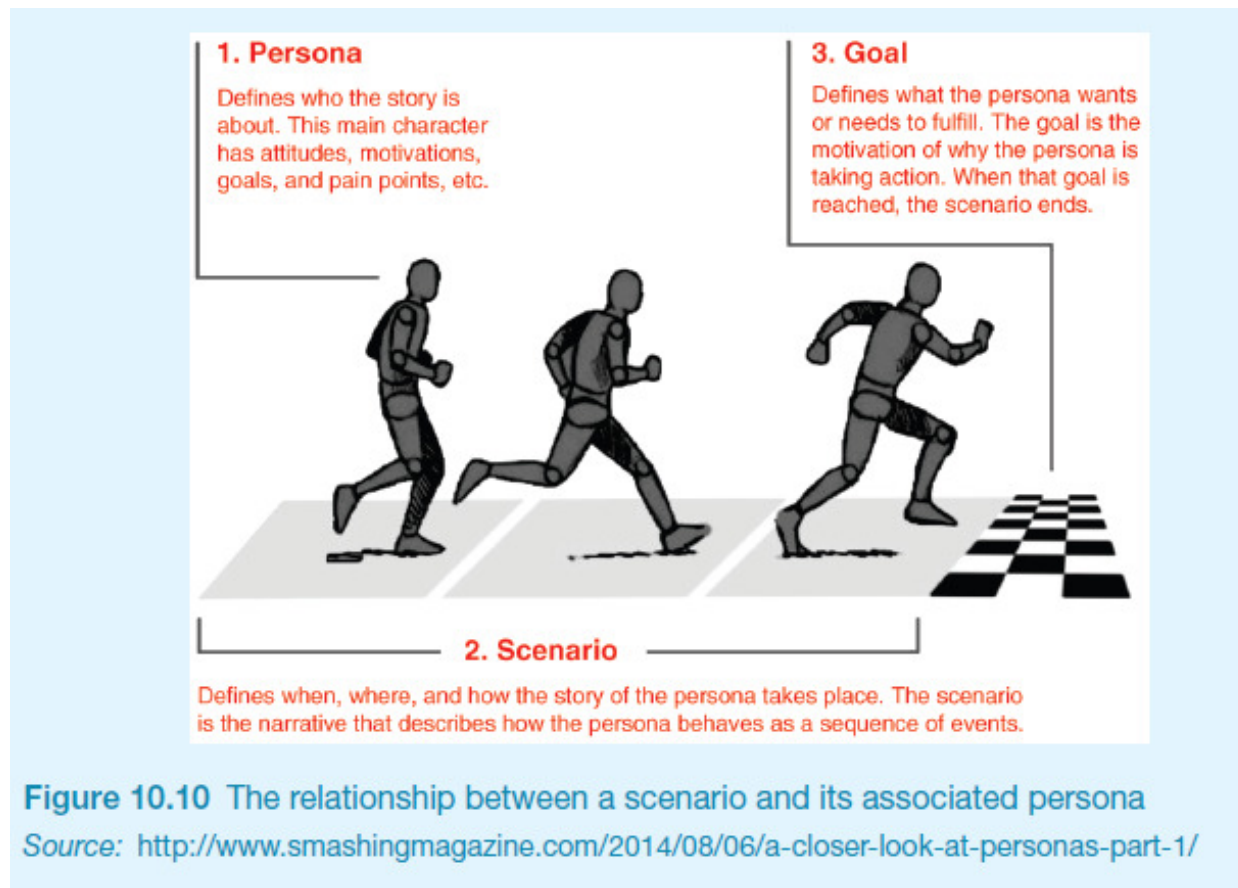
Storyboards

- Rough idea of a **user's activities** can be presented *via* a **storyboard** as a series of individual frames or drawings
 - presenting a sequential storyline
 - showing how a user might progress through activities
- Considering **personas**, **tasks**, and **scenarios**, bringing in more detail, and a chance to role play
- Help users communicate with the designers about
 - **what** they do
 - **how** they do it

Personas

- Capture a set of user characteristics (user profile)
- Not real people, but synthesised from real users
- Should not be idealised
- Bring them to life with a name, characteristics, goals, personal background
- Develop a small set of personas with one primary

Scenarios and Personas



Example

- A financial management interface

The screenshot displays the Abbey National website's 'Mortgages' page. At the top right, there is a search bar with the text 'Search our website' and a 'Go' button. Below this is a navigation menu with links: 'Homepage', 'Interest Rates', 'How to Contact Us', 'Apply Now', 'Abbey Corporate', and 'Other Abbey Websites'. On the left side, a vertical menu lists various services: 'Mortgages', 'Savings', 'Personal Banking', 'Credit Card', 'Loans', 'Investments', 'Pensions', 'Protecting & Insuring', 'Abbey National business', and 'Abbey at work'. The 'Mortgages' section is highlighted. The main content area is titled 'Mortgages' and contains three columns of information. The first column, 'Choosing the right mortgage', describes the aim to make it simple and easy to find the right mortgage. The second column, 'Useful info and guides', highlights important information to consider before deciding on a mortgage. The third column, 'Existing customer?', offers special options for existing customers. Each column has a green 'Go' button. On the right side, there is an 'e-banking log on' button and a 'By the way...' box with a warning icon, stating that the service is available 24/7. At the bottom, there is a 'Peace of Mind Guarantee' logo and links to 'Peace of Mind Guarantee', 'Privacy Statement', and 'Important legal information'. A footer section titled 'Services in alternative formats' provides additional information about the company's regulatory status and services.

Search our website

Homepage Interest Rates How to Contact Us Apply Now Abbey Corporate Other Abbey Websites

Mortgages
Choosing the right mortgage
Information & guides
Existing Customers

Savings

Personal Banking

Credit Card

Loans

Investments

Pensions

Protecting & Insuring

Abbey National business

Abbey at work

Mortgages

Choosing the right mortgage
Our aim is to make it as simple and easy as possible for you to find the right mortgage for your needs.

Useful info and guides
This section highlights some important information that should be considered before you decide on the mortgage for you.

Existing customer?
If you are an **existing Abbey mortgage customer** who is not moving home and looking to review your mortgage arrangements, we have a range of special options for you.

e-banking log on

By the way...
Hectic lifestyle? You can [bank](#) wherever, whenever you want, 24 hours a day, 7 days a week.

Peace of Mind Guarantee
Peace of Mind Guarantee
Privacy Statement
Important legal information

Services in alternative formats
Abbey National plc, which is authorised and regulated by the Financial Services Authority only advises on its own Life Assurance, Pension and Collective Investment Scheme products. The Financial Services Authority does not regulate the provision of Mortgages, Credit Cards and Unsecured Personal Loan agreements. To help us improve our service we may record or monitor phone calls. Abbey is a registered trademark of Abbey National plc.

Example

Gerard Ramplar



Life story

52 year old.
2 children, 21 and 13 years old.
Plum.
Married.
Financially savvy, but out of date knowledge.
Self employed consultant.
Paid off mortgage on family home 5 years ago
Tight reign on his finances and understands most products, but not in any specific detail.

Goal

Looking to buy a second home, probably in Edinburgh so that his son can stay there whilst at University.

Wants a secure investment for later retirement – buy to rent.

Wants to help his son out – will rent to him and his friends at reduced rates whilst at University.

National retail website scenarios

Why

Gerard read the Which? guide to good mortgages and noticed that gave a good rate of interest for the amount he wanted to borrow (£200,000). As he works from home he decided to check out the web site (address given in the guide) to find out more details of their offers before proceeding further.

What he needs to find

Eligibility considering age and his income – currently self employed.

How much he can borrow given his age and the equity in his current home.

How much the mortgage will cost in terms of deposit needed and % rates.

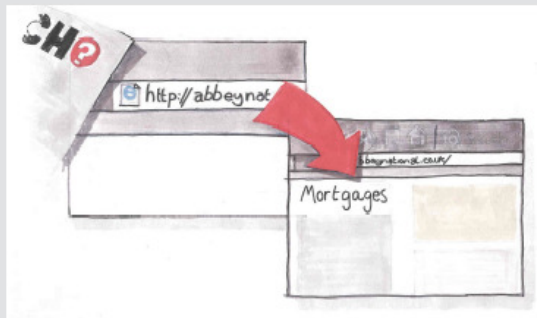
How flexible the mortgage will be in terms of payment periods and the possibility of moving – supposing his son changes University.

Storyboards: Example

Action

The web site address given in the Which? guide pointed Gerard to the homepage. From there he selects the direct route to mortgages.

1



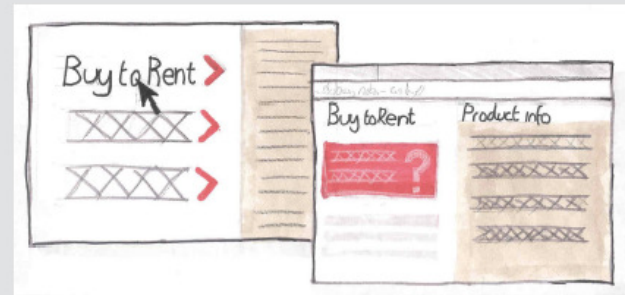
Outcome

He is presented with a number of different mortgages to select from.

Action

He chooses "buy-to-rent".

2



Outcome

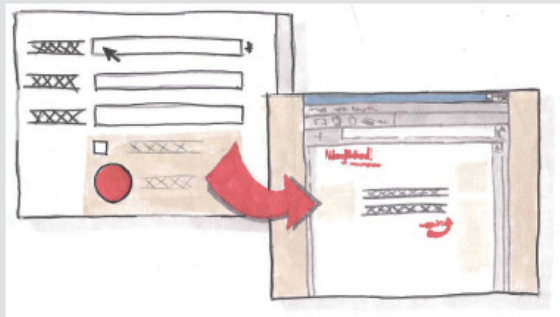
Along with product information, a suggestion appears at the side "Check this is the right mortgage for you".

Storyboards: Example

Action

Gerard, wanting some reassurance, clicks the suggestion which links to a mini questionnaire at the side asking a few simple questions.

3



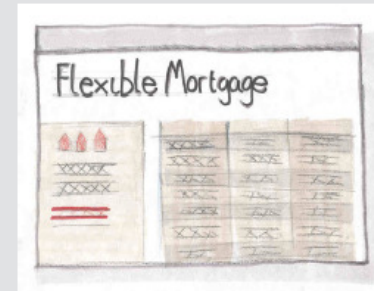
Outcome

The questionnaire results suggest a standard flexible mortgage would be more appropriate giving [redacted] point of view on endowments as an explanation.

Action

Gerard reads more about the standard flexible mortgage to find out how much he could borrow, how much his repayments would be and how long it would take to repay. This is displayed in a clear and simple manner allowing easy comparison between the different variables.

4



Outcome

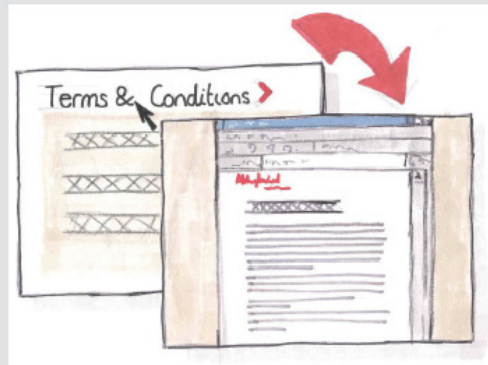
He found that he could borrow the amount he wanted and the repayments seemed within his budgets.

Storyboards: Example

Action

One niggling thought was left about how flexible it would be. He pressed on into deeper information about the terms and conditions.

5



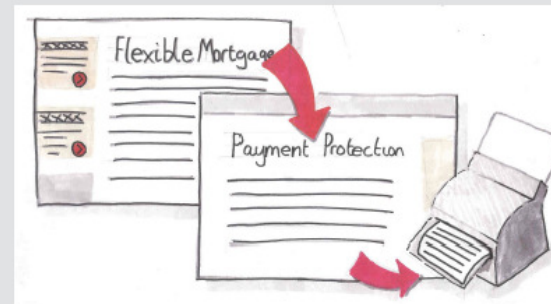
Outcome

He found that if circumstances changed he could review the mortgage plan. Gerard felt happy and relaxed.

Action

He noticed there were pockets of information available related to not only home insurance (he already had that so wasn't really interested), but also payment protection. He clicked on the link to find out more.

6



Outcome

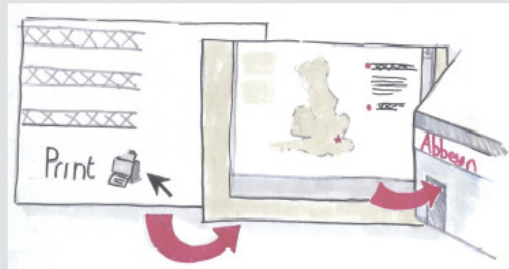
The information simply explained the benefits. Gerard understood it would protect his payments which was important as he was self-employed. He printed this out to file for reference.

Storyboards: Example

Action

Gerard printed out the key points of his calculations and the mortgage he was interested in and checked out the location of his nearest branch. He preferred not to start his investment on-line as mortgages are rather large commitments.

7



Outcome

He visited a branch to speak with an advisor to arrange his mortgage.

Workshops

- Provide a forum for discussion
- Designers and users can ask each other about their perspectives
 - Establish common understandings of the design issues
 - Focus their views of the design
- Typically used to fill in gaps in understanding about the situation
 - Designers usually enquire about users' work environment
 - Users usually ask about technological possibilities



Study Material & Reading

- BOOK: Preece, J., Rogers, Y. and Sharp, H. Interaction Design.
 - Chapter: The Process of Interaction Design
 - Chapter: Design, Prototyping and Construction



Summary

- Participatory design involves target audience at each stage
- Is collaborative and iterative
- Involves:
 - Brainstorming
 - Concept development
 - Lo-fi prototyping
 - Storyboards
 - Workshops