



Design Interaction and User Interface

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Agenda

- Defining UI Framework
- Creating Prototype
- Converting Prototype into a Product
- Focusing on Interaction

UI and ID Framework

- Six steps according to Cooper and Reimann, 2003
 - Define the form factor and input methods
 - Define the views
 - Define the functional and data elements
 - Determine the functional groups and hierarchy
 - Sketch the interaction framework
 - Construct key path scenarios (Prototyping)

Design Imperatives and Principles

Ethical

Purposeful

Pragmatic

Elegant

Interaction Design Principles Level

- Conceptual-level principles
 - What the product is
- Interaction-level principles
 - How a product should behave
- Interface-level principles
 - the interface look and feel

ID patterns

- **Postural:** These help determine the product stance in relation to the user
- **Structural:** These solve problems that relate to the management of data
- **Behavioral:** These solve specific interactional problems with individual data or functional objects, or groups of objects.

Software Postures

- Sovereign
 - a full-screen program that keeps the user's attention
- Transient
 - comes and goes when the user needs to perform a specific task
- Deamonic
 - one that doesn't normally interact with the user
- Auxillary
 - combines the characteristics of sovereign and transient applications

Why Prototyping Important

- Evaluation and feedback are central to interaction design
- Stakeholders can see, hold, interact with a prototype more easily than a document or a drawing
- Team members can communicate effectively
- You can test out ideas for yourself
- It encourages reflection: very important aspect of design
- Prototypes answer questions, and support designers in choosing between alternatives

What to Prototype

- The Product
- Work Flow
- Screen Layout and Information Display
- Difficult, controversial, critical areas

Kind Of Prototyping

- Low-Fidelity / Mock
 - Use medium that unlike the final medium
 - Quick, cheap, and easy to change
 - Mostly used on Horizontal Prototype
- High-Fidelity / Proof of Concept (POC)
 - Uses materials that you would expect to be in the final product.
 - Looks more like than final system
 - Using the real software development like Visual Studio, Eclipse, etc

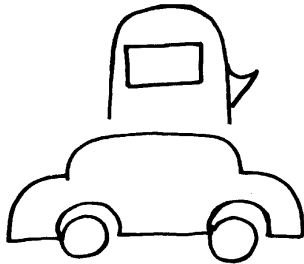


Prototype

Low Fidelity

Sketch

①



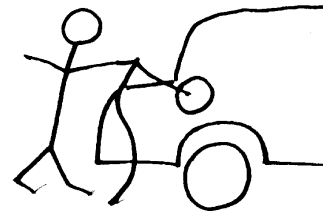
Drive car to
gas pump

②



Take nozzle
from pump....

③



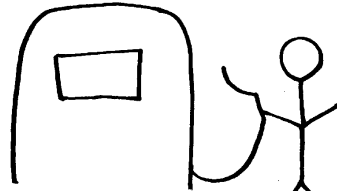
... and put it
into the car's
gas tank

④



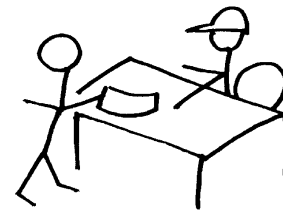
Squeeze trigger
on the nozzle until
tank is full

⑤



Replace nozzle
when tank is
full




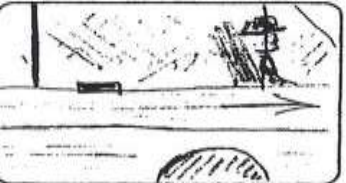
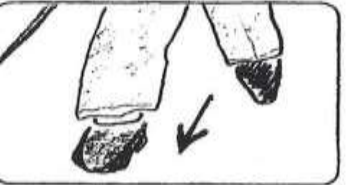

⑥




Pay cashier


Storyboards

Sample Storyboard

Shot #	VIDEO	AUDIO
1	<p>LS Street</p> <p>Instructor and Jack walk out of driving school towards a parked van. Instructor carries a clipboard.</p> 	<p>THEME MUSIC</p> <p>FADE TO STREET NOISE</p>
2	<p>MS Instructor & Jack</p> <p>Opening the van doors, on opposite sides of the van looking at each other.</p> 	<p>INSTRUCTOR: Don't forget that pedestrians have the right of way. Always yield at stop signs.</p>
3a	<p>MS Instructor and Jack</p> <p>Reverse of 2. They get inside van.</p> 	<p>JACK: All right.</p> <p>THEME MUSIC IN AS THEY GET IN VAN.</p>
3b	<p>TILT TO:</p> <p>MS Van w. instructor and Jack inside.</p> <p>They drive off.</p> 	
4a	<p>CU Tom's feet</p> <p>Walking toward camera, dancing.</p> <p>Camera tracks with him, then</p> <p>TILT TO:</p> 	<p>MUSIC CUT TO HARD ROCK: (TOM'S MUSIC)</p>
4b	<p>MCU Tom w. Walkman</p> <p>Still dancing down street.</p> <p>He exits the frame.</p> 	<p>FADE OUT</p>

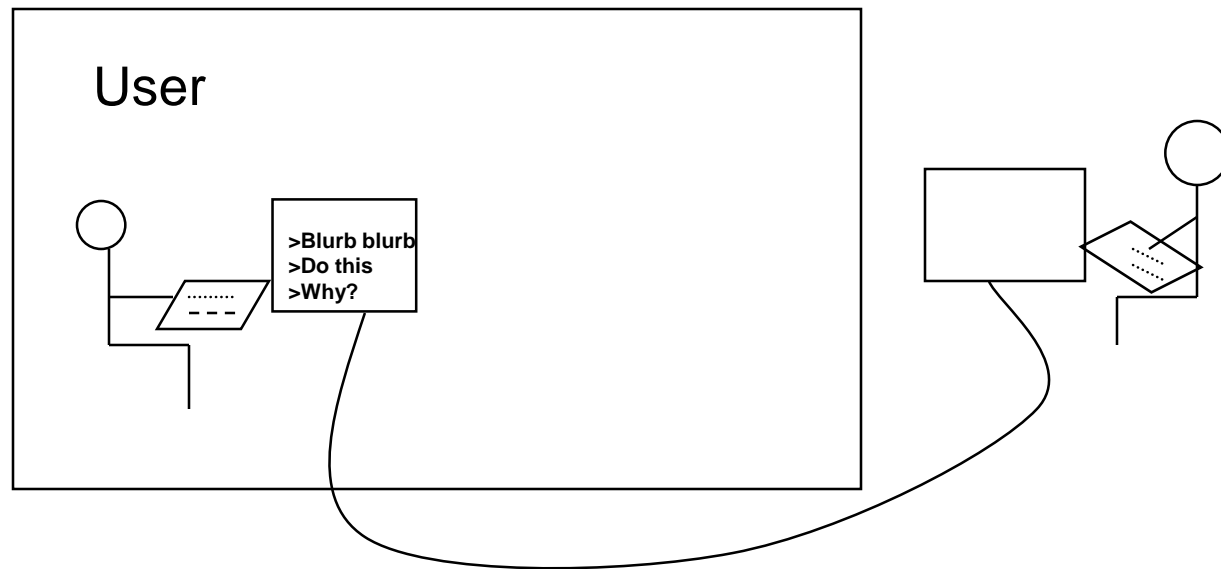
Card-Based

	Travel Organiser	23 August 2006	
Train timetable from Milton Keynes Central to York on 16.09.06			
Depart	09:09	10:09 same	22:09
Arrive	12:30	13:30 mins past hour	01:30
Accommodation	Hotel	B & B	
	£40 to £150	£20 to £60	

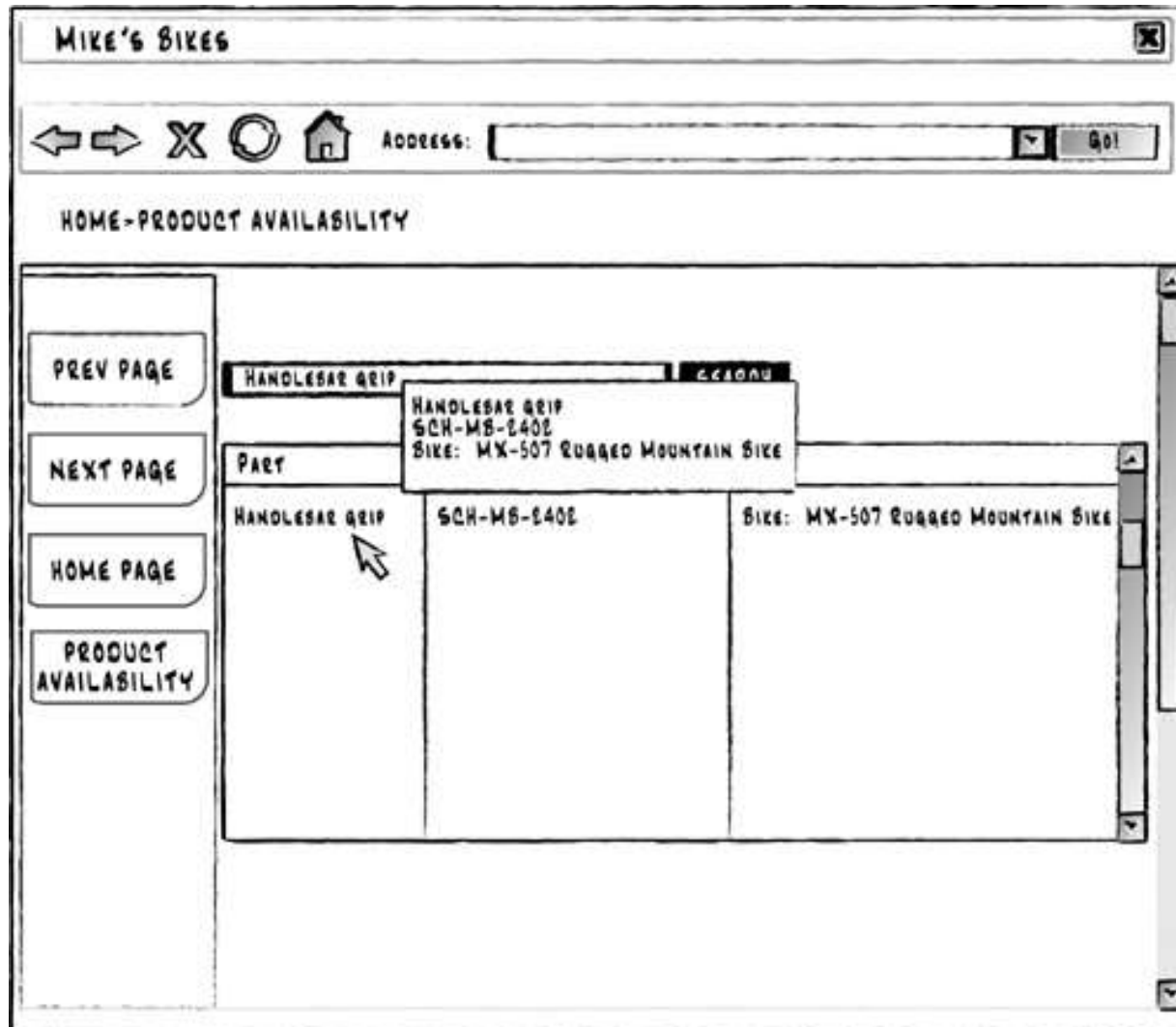
	Travel Organiser	23 August 2006
WELCOME HELEN		
Where do you want to go?	<input type="text" value="YORK"/>	
What date do you want to travel?	<input type="text" value="16/9/06"/>	
Which form of transport do you want?	<input type="text" value="TRAIN"/> ▼	
Do you need accommodation?	<input type="text" value="YES"/> ▼	

“Wizard of Oz” Prototype

- Creating a picture of prototyping of the entire system
- Great to understand the user expectation



Paper Prototype





Sketch on Powerpoint

Demo



Prototype

High Fidelity

High Fidelity Prototyping

- POC of a website (i.e. Localhost Version)
- POC of an Application
 - Developer Device
 - Developer Computer
- Tools that can be used for HF Prototyping
 - IDE tools
 - CASE tools with Round Trip Engineering

Vertical and Horizontal

- ‘horizontal’: provide a wide range of functions, but with little detail. Low fidelity based model
- ‘vertical’: provide a lot of detail for only a few functions. High fidelity based model.

Construction

- Taking the prototypes (or learning from them) and creating a whole
- Quality must be attended to: usability (of course), reliability, robustness, maintainability, integrity, portability, efficiency, etc
- Product must be engineered
 - Evolutionary prototyping
 - ‘Throw-away’ prototyping

Considering Interaction Types

- Which interaction type?
 - How the user invokes actions
 - Instructing, conversing, manipulating or exploring
- Do different interface types provide insight?
 - WIMP, shareable, augmented reality, etc

From Requirement to Prototype

- Common Scenario

- Requirements → Usage Scenario → StoryBoard → High Fidelity
- Requirements → Use Case → Card-Based → High Fidelity
- Requirements → Conceptual Model → Sketch → High Fidelity

Conclusion

- Different kinds of prototyping are used for different purposes and at different stages
- Prototypes answer questions, so prototype appropriately
- Construction: the final product must be engineered appropriately
- Consider interaction types and interface types to prompt creativity
- Common Scenarios to Create an Application