The HCI Development Process

Tony Scarlatos
Traditional Software Engineering Process: Waterfall Model

- Requirements
- Design
- Code
- Integration
- Acceptance
- Release
HCI Linear Development Process

**DESIGN PROCESS**

01. Need Evaluation → Evaluation of existing Product or Service → Users Task Analysis


03. Prototype
Linear Development Process

**Analyze**
- First iteration
  - heuristic evaluation
  - user testing
  - focus groups
  - interviews: users, stakeholders, CSRs, help desk, etc.
  - contextual inquiries
  - persona analysis
  - metrics analysis
  - competitive analysis
  - surveys: online and paper

**Test**
- A/B testing
- peer review
- path analysis
- click maps
- existing documentation
- development group input
- market research
- business review

**Refine**
- Second iteration
  - user testing
  - contextual inquiries
  - peer review
  - persona analysis
  - online surveys

**Test**
- A/B testing
- path analysis
- click maps
- business review

**Design**
- Final iteration
  - user testing
  - peer review
  - persona analysis

**Test**
- online surveys
  - A/B testing
  - path analysis
  - click maps
  - business review

**Deliver**
- UX requirements
- Hi-res mockups
- Functioning prototypes
- Lo-res wireframes
- Flow diagrams
- Findings reports
- Personas
- Navigation
- Site maps
- Design reviews
- Design notes
- Usability test results
- Labels & user text
Linear Development Process

7 Phases of User-Centered Design
When the user becomes the Co-Designer

- Identify The User
- Research The User
- Create Goals
- Design
- Prototype
- Test
- Produce

Primary User
- Collect Data: Interviews, Questionnaires, Focus Groups
- On site Observations, Video Tape
- Identify Usability and how it can be measured
- Effectiveness, Efficiency, Safety, Utility, Learnability, Memorability
- Create mock-ups that the user can evaluate throughout the design process
- Be sure that instructions can be intuitively understood. Do this by creating constraints and visual cues.
- Evaluate Designs
- Have the user test the object in the environment that the product will be used and document.
- Give the user minimum instructions on how to use the product
- Evaluate user Satisfaction
- Continue to evaluate the product with user feedback in interviews and surveys.

Secondary User
- Evaluate users environment, behavior and experience
- Understand what qualities are important to the user

Tertiary User

Works Cited:
- Sanders, Elizabeth B. "From User-Centered to Participatory Design Approaches." In Design and the Social Science, Rpt. in Taylor & Francis Limited, 2002
- "User-Centered Design", Wikipedia.org, 10 Jan, 2010, Web, 16 Jan, 2010
HCI Iterative Design Process

Figure 1
Steps of the Engineering Design Process

1. Identify the Need or Problem
2. Research the Need or Problem
3. Develop Possible Solution(s)
4. Select the Best Possible Solution(s)
5. Construct a Prototype
6. Test and Evaluate the Solution(s)
7. Communicate the Solution(s)
8. Redesign
Iterative Design Process

6 Steps of the Design & Development Process

1. Creative Brief
2. Research & Development
3. Design Refinement
4. Project Completion
5. Follow-up
6. Deploy
ID Design Process

Interaction Design Process

**Problem**
- Client/Customer Need
- Product Environment
- Market Opportunity

**Research**
- Stakeholder Interviews
- Ethnographic Research
- Market Landscape

**Framework**
- User/Technical Requirements
- Context of Use
- Business Goals
- Culture

**Evaluation**
- Concept Testing
- Quantitative to Qualitative Feedback

**Solution**
- Rapid Prototype
- Abstract Representation
- Concrete Representation

**Final Product**
- Satisfies Problem and design constraints

**Deliverable**
- Validate against Problem
- Re-enter design loop or Move to Final Product

**CLIENT**
- Design Team

**USERS**
- Involve users in every stage of the process, quickly iterating through solutions toward the final product

Evaluate by

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Eight Steps of HCI Development

1. Design Brief
2. Research
3. Framework
4. Interface Design
5. Prototype
6. Implement
7. Evaluate
8. Revise
Design Brief

• Sometimes referred to as a Scope Of Work (SOW).
• Identifies the problem to be solved or the goal to be obtained.
• Identifies the stakeholders.
• May propose possible solutions or avenues for exploration.

<table>
<thead>
<tr>
<th>brief overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>I'm an IT Test Analyst by trade and I have a real passion for technology, testing, usability, breaking stuff and of course, social media.</td>
</tr>
<tr>
<td>I love using and integrating new and existing technologies... and really appreciate when I come across clear and helpful solutions to any issues I'm facing.</td>
</tr>
<tr>
<td>My blog, The Social Media Guide, was born out of a desire to help others who face similar problems with social media.</td>
</tr>
<tr>
<td>I try to provide clear solutions so that anyone can follow and understand.</td>
</tr>
<tr>
<td>To take things to the next level... I need a logo!</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>brand name</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://thesocialmediaguide.com.au">http://thesocialmediaguide.com.au</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>target audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>All users of social media... from neophytes to advanced... from young to old... male or female... from all countries... and definitely mainstream.</td>
</tr>
<tr>
<td>Anyone who has an interest in, and uses, social media and social networking platforms including Facebook, Twitter, YouTube, Google, WordPress, Blogging, StumbleUpon, Delicious, etc.</td>
</tr>
<tr>
<td>My blog focuses on &quot;helping people connect&quot;, using social media.</td>
</tr>
<tr>
<td>The Social Media Guide provides clear and very easy to understand guides / instructions / 'how-to's' / setup procedures, etc. on all things social media.</td>
</tr>
<tr>
<td>If there are common problems that people are facing with social media, eg. &quot;How do I do this in Facebook&quot;, or &quot;How do I use Twitter&quot;, then The Social Media Guide is the place to go to find these answers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am after a logo that possibly makes use of the double-meaning of - &quot;The Social Media Guide&quot;.</td>
</tr>
<tr>
<td>1st meaning: The Social Media Guide, as in &quot;guide book&quot;.</td>
</tr>
<tr>
<td>2nd meaning: The Social Media Guide, as in &quot;I'm the guide... I'm the authority on social media who shows the way by leading and advising&quot;.</td>
</tr>
<tr>
<td>I may change the background of my blog from dark to light, so the logo mustn't be limited to my blog's background shading.</td>
</tr>
<tr>
<td>I also plan to use this logo on my Facebook page; Twitter background, eBook, business cards, favicon, etc.</td>
</tr>
<tr>
<td>New, modern, fresh, social, sharing, helping people to connect...</td>
</tr>
<tr>
<td>Not futuristic.</td>
</tr>
<tr>
<td>The words &quot;The Social Media Guide&quot; don't necessarily have to be in the logo.</td>
</tr>
</tbody>
</table>
Research

- Surveys of end-users.
- Interviews with end-users.
- Observation of end-users as they perform tasks and interact in their environment.
- Compilation and analysis of data.
The Framework – Visualizing Research

- Personas
- Scenarios
- Mood Boards
- Task Analysis
Personas

Samantha Bell

“I’d love to keep in contact with my friends”

Sam is about to go abroad for her gap year, so her parents decided to get her a new camera, to make sure she’s able to record everything she gets up to.

She likes the camera as it looks so modern, and it’s able to do so much more than a lot of her friends’ cameras.

She loves being in contact with people all the time, and finds it’s a great way to kill time like when waiting for the bus. She uses a lot of the more advanced features – panoramic shots, online upload and...

When she encounters a problem she ignores it most of the time – she’s not sure if she even got a manual with the camera. When she has trouble she can’t ignore she speaks to her friends, or goes into a camera store – she wants to be talked through the problem.

First time user

Female, 27 year old, single student

Sam prefers to learn how to things by trying things out by herself. She isn’t worried about ‘breaking’ anything. If she does need help she would prefer to not to refer to a manual but “do it herself”.

Needs

In order of preference:
1. To share pictures with her parents
2. To share her pictures with her friends
3. To share her pictures with people she meets whilst travelling

Ideal features

- Ability to take pictures
- Ability to upload images to personal site using 3G/WiFi
- Allowing others to access her pictures remotely
- Long battery life
- Ability to name and add comments to uploaded images
- Ability to create several albums, and upload pictures to each

Frustrations

- Lack of wireless/3G access
- Slow uploads
- Low battery life
- Need to be plugged in to upload images
- Slow shutter speed
- Want to be able to name/add comments to uploaded images
- Getting online is confusing
- Creating new albums

Key attributes

- Knowledge
- Experience
- Help use
- Confidence

Webcredible – user experience research & design

March 2010
Personas

**Vacation Planner Ecosystem**

**Touch Points**
- digital
- real world
- family
- parents
- other

**Influencers**
- Angie (Planner-In-Chief)
- Others

### Personas

#### Kivio Users

<table>
<thead>
<tr>
<th></th>
<th>The researcher</th>
<th>The Sysadmin</th>
<th>The OSS developer</th>
<th>The CS student</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>Alexander Mei</td>
<td>Donald M. Berry</td>
<td>Kristian Larson</td>
<td>Eric Neville</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>20</td>
<td>30</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Germany</td>
<td>US</td>
<td>Sweden</td>
<td>France</td>
</tr>
<tr>
<td><strong>Social Life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Alexander lives with his girlfriend in a flat in Hamburg.
- Donald lives with his wife and 1-year-old daughter in a house in Portland.
- Kristian shares an apartment with two friends in Stockholm. His girlfriend lives in Lapland. They see each other every weekend.
- Eric lives with his parents in a small city close to Lyon. He visits the university there. Often, he stays at his friend's apartment for playing PC games and programming.

| **Work Life**           |              |              |                   |               |
- He works at Centre for Environmental Systems Research and designs plans for renewable energy in a EU-funded project.
- He is a lead system administrator in a large network solutions company in Portland.
- He is a software developer with a day job in a medium-sized software company. Works on KDE in his spare time.
- He is a student of computer science. Besides university, he performs small programming jobs for people in his neighborhood.

<table>
<thead>
<tr>
<th><strong>Computer Experience</strong></th>
<th>All are highly experienced with computers.</th>
<th>25-50 hours per week</th>
<th>40-50 hours per week</th>
<th>30-50 hours per week</th>
<th>25-45 hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time at a computer per week</strong></td>
<td>26-50 hours per week</td>
<td>35-50+ hours per week</td>
<td>30-50+ hours per week</td>
<td>25-45 hours per week</td>
<td></td>
</tr>
<tr>
<td><strong>Computer tasks</strong></td>
<td>Office tasks and Field-dependent.</td>
<td>Development and network administration.</td>
<td>Mostly development and recreational.</td>
<td>Mostly development and recreational.</td>
<td></td>
</tr>
</tbody>
</table>
- Also educational and recreational.
- No development.
- Development and network administration.
- Mostly development and recreational.
- Also network administration and office.

<table>
<thead>
<tr>
<th><strong>Related to OSS</strong></th>
<th>He is not passionate about OSS.</th>
<th>He is a convinced user of OSS.</th>
<th>He is involved with OSS development.</th>
<th>He is a convinced user of OSS.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Requirements wrt diagramming</strong></td>
<td>Office requirements</td>
<td>Highest claims</td>
<td>easy-going</td>
<td>eager beaver</td>
</tr>
<tr>
<td><strong>Frequency of drawing diagrams</strong></td>
<td>Each 2nd month</td>
<td>Twice per month</td>
<td>Once a month</td>
<td>Each 2nd month</td>
</tr>
<tr>
<td><strong>Diagram main type</strong></td>
<td>Flowcharts.</td>
<td>All, except sitemap</td>
<td>Visualising thoughts</td>
<td>Diagrams mostly UML</td>
</tr>
</tbody>
</table>
- Also visualising thoughts.
- No technical ones.

<table>
<thead>
<tr>
<th><strong>Size and complexity</strong></th>
<th>15-20 elements, 2-3 levels, 3-7 shapes</th>
<th>15-30 elements, 2-5 levels, 4-9 shapes</th>
<th>15-20 elements, 2-3 levels, 3-7 shapes</th>
<th>15-20 elements, 2-3 levels, 3-7 shapes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagram purpose and context</strong></td>
<td>For non-IT job.</td>
<td>For the IT Job, never for himself.</td>
<td>For formally presenting.</td>
<td>For formally presenting in university. Not for himself, as work input or for any jobs.</td>
</tr>
<tr>
<td><strong>Current diagramming</strong></td>
<td>Power Point or OOo.</td>
<td>Visio</td>
<td>Pen and Paper.</td>
<td>Dia, Umplein.</td>
</tr>
</tbody>
</table>
Scenarios

(c) 1997 by Walter Maner
Scenarios
Mood Board
Interface and Interaction Design

- **GUI design**
  - Sketches and Wireframes
  - Screen Layout
  - Icons, buttons, controls, widgets

- **Interaction Design**
  - Software Flowchart
Interface Design: Sketches & Wireframes

1. For Q1 release, music search only
2. Related artists determined by user purchasing data mining
3. Album art to be approved by legal
Imagine you are an entrepreneur in the carriage era.

Design and assemble a 3D carriage!

Create your own poster!

Cathy's Carriage Company
Long Island
New York

So get ready to create your fortune!
Interface Design: Prototyping

Create Your Own Carriage Company Game

Developed by the Long Island Museum of American Art, History & Carriages

Choose the Era...

1830 1850 1890

Choose a Design...

Wagon Coach Carriage Sleigh

Assemble the Parts...

Drag & Drop Parts Into the Workshop!
Interface Design: Production

Create Your Own Carriage Game

Created by the Long Island Museum of American Art, History & Carriages

Choose a vehicle to build:

- The Park Drag
- The Hay Wagon
- The Rockaway
- The Cutter

The Cutter

Made for speed in the snow, cutters are light, fast, and flashy, with thin metal runners and ironwork scrolls. Leather snowguards block the flying chunks of snow and ice that the horses kick up in speedy runs over country paths.

Let's start building!
Interaction Design

Flow line diagrams serve to establish the stages of an application, or the levels of a game. They help to define the “repertoire of functionality” that the interface needs to support.
Information Architecture
Rapid Prototyping Tools: Card-Based

Hypercard was one of the first “authoring” tools.
Authorware and Max/MSP are examples of Icon-Based authoring tools, and so is AppInventor. Icon-based tools closely resemble flow line diagrams used in interaction design.
Rapid Prototyping Tools: Timeline-Based

Adobe Director and Flash are examples of Timeline-Based authoring tools. Director was used to prototype Halo 2.
Rapid Prototyping Tools: Real-time interaction

Unity 3D is one of a new class of tools that facilitate development of real-time interactions with 3D environments.
High Fidelity Prototype: Android
High Fidelity Prototype: iPhone
Implementation and Evaluation