Interaction Design

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What do you know?

What do you think Interaction Design stands for?
What do you expect?

Interaction Design will be:

- Awesome
- Okay
- Boring
- Useless
- The end of my life...

Myself I’m not a big fan...

This is also the first time I teach someone about Interaction Design...
Good or bad?

www.baddesigns.com
Good or bad?

Answering machine?
Good or bad?

Buttons...
- Amount?
- Place?
Interaction Design

Is not about strict guidelines....

So what is it about?
Overview, Interaction Design is about...

Amongst others (and most importantly):

- Providing information, visualising functionality ~ **showing what a user can do**
  - Effectively
  - Efficiently
  - Consistently
- Providing feedback
- Affording (**allowing**) certain types of interaction
## Usability

1. **Effective use of product**: Does the product **do what it is supposed to do**?
2. **Efficient use of product**: Is the user **supported in performing tasks**?
3. **Safe use of product**: Does the **product** protect the user from possible danger?
4. **Good functionality**: Does the product **provide the desired function**, how good?
5. **Learnability**: Is it **easy to learn** how to use the product?
6. **Remember-ability**: Will the user **remember how to use the product**, e.g. even when the product is only used once every year?
User experience

More subjective (based on opinions)

BUT ALSO:
- Boring.....
- WHY DOESN’T IT WORK LIKE I WANT IT TO WORK?
- I PRESSED THIS BUTTON 15 TIMES!=@>$@)!*

Do I like the product?
The way it looks?
Do I enjoy using the product?
Does the product support me in what I want to achieve?
etc...
Example:

IxD factors for a specific application...
Some terminology

Usability

User Experience (UX)

Human-Computer Interaction (HCI)

Window-Icon-Menu-Pointer (WIMP)

User Interaction (UI)

And many… many more… terms

User Interface (UI) !?!?! → Graphical UI (GUI)
Human-Computer Interaction (HCI)

Window-Icon-Menu-Pointer (WIMP)

“HCI researchers still do not understand why some post-WIMP designs are perceived as ‘natural’ or ‘intuitive’, while others are not” (Jetter et al., 2013)

Natural Interaction (NI)

Interaction that feels ‘natural’ or ‘intuitive’... Every researcher seems to come up with his own terms...
The ‘Norman’ door

Don Norman (some guy that talks a lot about his fancy cars)

http://99percentinvisible.org/article/norman-doors-dont-know-whether-push-pull-blame-design/

https://www.youtube.com/watch?v=yY96hTb8WgI
Interaction Design is about:

Cognition:

1) The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses.
2) A perception, sensation, idea, or intuition resulting from the process of cognition.

https://en.oxforddictionaries.com/definition/cognition
Let’s have a look at gaming Interfaces:

Microsoft:
https://www.google.co.uk/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8&q=microsoft%20vision%202020

One more time... what do you expect?

Interaction Design will be:

- Awesome
- Okay
- Boring

Yaay.

I actually like Interaction Design!

I’ve studied the subject for several years and it proved to be useful in many ways!
Psychology and cognition (simple)

- Attention
- Perception (and pattern recognition)
- Memory
  - Short term
  - Learning and remembering
  - Knowing
- Language
- Comprehending
- Deciding, judging and reasoning
- Problem solving

What do you focus on? How to affect this?

**Experiencing** sensory information, how to influence?

**Limited capacity!** But can be supported (e.g. recognition)

Usually remember $7 \pm 2$ items

Amongst others **semantics**

...  
...  
...  

What are the **practical implications**?
Intuitive interaction design principles

Use familiar symbols and/or words for well-known functions, put them in familiar or expected position and make the function comparable with similar functions users have seen before.

Make it obvious what less well-known functions will do by using familiar things as metaphors to demonstrate their function.

Increase consistency so that function, location and appearance of features are consistent between different parts of the design and throughout each part.

Blackler et al. (2005)
Intuitive interaction guidelines

Appearance of buttons, like shape, size, colour and labelling, is the most important factor with respect to interaction speed and how intuitive the interface is thought to be. Whereas location can decrease the response times, but only marginally influences the intuitiveness of the interface.

Familiarity with technology is more indicative of performance than level of expertise with a certain type of product.

Younger people generally are more familiar with interfaces, and use them more intuitively. Aging effects, adaptability to new technology and overall familiarity with ‘modern’ types of interfaces play a role.

Transferring features from other products and experiences can allow both innovative and more intuitive interfaces.
Intuitive....

According to Spool (2005) a design is intuitive if the user does not require new knowledge to operate the system.

So is it all about previous experiences and familiarity? ... lame...
Overview, Interaction Design is about...

Amongst others (and most importantly):

- Providing information to a user, visualising functionality ~ showing what a user can do
  - Effectively
  - Efficiently
  - Consistently
- Providing feedback
- Affording (allowing) certain types of interaction
Providing feedback

The tangible/discernible consequence of an interaction.

Can be visual (see), tactile (feel), auditive (hear), ... maybe digital taste?

Examples:

- ‘your message has been sent’ pop-up in Gmail
- vibrations when you use the virtual keyboard on your smartphone
- the ‘click’ sound when you use a digital camera
### Affordances

<table>
<thead>
<tr>
<th>Affordance type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>Design feature that helps users in knowing something</td>
<td>A button label that helps users know what will happen if they click on it</td>
</tr>
<tr>
<td>Physical</td>
<td>Design feature that helps users in doing a physical action in the interface</td>
<td>A button is large enough so that users can click on it accurately</td>
</tr>
<tr>
<td>Sensory</td>
<td>Design feature that helps users sense something (especially cognitive affordances and physical affordances)</td>
<td>A label font size large enough to read easily</td>
</tr>
<tr>
<td>Functional</td>
<td>Design feature that helps users accomplish work (i.e., the usefulness of a system function)</td>
<td>The internal system ability to sort a series of numbers (invoked by clicking on the Sort button)</td>
</tr>
</tbody>
</table>
Interaction - reflection model
GUI’s are never perfect!

Even when a GUI is perfect for one type of user, this might be completely different for another type.

To check whether ‘Interaction Design’, be it a GUI or physical product, is good:

Evaluate.
Evaluation

More specifically, evaluate early and often for:

- Feedback in early design stages provides insight in interaction problems
- Important problems can be resolved before they are embedded everywhere in the product
- The designers can focus on solving such ‘real’ problems instead of focussing on less important details
Evaluation

Formative evaluation: testing of ‘prototypes’, often in experimental settings depending on the design stage of a prototype

Summative evaluation: testing of end-products, often in real settings
Usability test:

- More applicable to later stages of design-process or even to end-product.
- Focuses on testing usage of a product by a certain group/type of users.
- Test-environment and test usually under strict observation of evaluator.  
  - Performance measurements, e.g. amount of errors and time taken for an interaction.
- Important for ‘standard’ products that last a while (e.g. Microsoft Word).
- Findings of the test are converted into improvement of usability.
Field studies:

- More applicable to later stages of design-process or even to end-product.
- Focuses on testing usage of a product by a certain group/type of users.
- Test-environment usually in ‘natural environment’ of the end-user.
- Mostly observation-methods and questionnaires/surveys:
  - Possibilities for a new technology?
  - Determining requirements.
  - Existing technologies in a new context?
- Findings of the studies are converted into improvement of usability.
Evaluation (3/3)

Analytical evaluation:

- Inspections:
  - Heuristic evaluation
  - Walkthrough
- Usually no end-users involved!
- Theoretical model testing, e.g. Fitts’ Law where a.o. time and distance to click on some menu-item are related to the accessibility of the menu.
## Evaluation

<table>
<thead>
<tr>
<th>Method</th>
<th>Usability testing</th>
<th>Field studies</th>
<th>Analytical eval.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observing</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Asking users</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Asking experts</td>
<td></td>
<td>(x)</td>
<td>x</td>
</tr>
<tr>
<td>Testing</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modeling</td>
<td></td>
<td></td>
<td>x</td>
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<tr>
<td><strong>Users</strong></td>
<td>Perform tasks</td>
<td>Natural use</td>
<td>-</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Controlled</td>
<td>Natural</td>
<td>Anywhere</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Applied</td>
<td>End-user</td>
<td>Expert</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td>Quantitative</td>
<td>Qualitative</td>
<td>Problems/quant.</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>Measures, errors</td>
<td>Descriptions</td>
<td>Problems/measures</td>
</tr>
</tbody>
</table>
Evaluation practically

Often use various studies and tests!

But how to collect data?

- Interviews
- **Surveys**
- Observation
Surveys

Open questions?

- Can be regarded as a semi-structured interview!

Closed questions?

- Beware of answering the questions yourself!
- Beware of negation!
- Likert-scales
Next time

Azmi will tell you more about surveys!