

# Analytics evaluation

## Unit 3



# Learning outcomes

- Understand fundamental design principles
- Introduce Nielsen's Heuristics
- Develop
  - awareness of how to apply them in design
  - Critical ability to evaluate other people design

# Design principles

- Generalizable abstractions for thinking about different aspects of design
- The do's and don'ts of interaction design
  - Prescriptive statements
- What to provide and what not to provide at the interface
- Derived from a mix of theory-based knowledge, experience and common-sense

# Design principles

- Visibility
- Feedback
- Constraint
- Mapping Consistency
- Affordance

# Visibility



- This is a control panel for an elevator.
- How does it work?
- Push a button for the floor you want?
- Nothing happens. Push any other button? Still nothing. What do you need to do?

It is not visible as to what to do!

From:  
[www.baddesigns.com](http://www.baddesigns.com)

# Visibility



...you need to insert your room card in the slot by the buttons to get the elevator to work!

How would you make this action more **visible**?

- make the card reader more obvious
  - provide an auditory message, that says what to do (which language?)
  - provide a big label next to the card reader that flashes when someone enters
- 
- make relevant parts visible
  - make what has to be done obvious

# Feedback

- Sending information back to the user about what has been done
- Includes sound, highlighting, animation and combinations of these
  - e.g. when screen button clicked on provides sound or red highlight feedback:

Previous → “ccclchhk”

Previous → Previous

# Transparency



- useful feedback
- easy to understand
- intuitive to use
- clear & easy to follow instructions
- appropriate online help
- context sensitive guidance of how to proceed when stuck



# Constraints

- Restricting the possible actions that can be performed
- Helps prevent user from selecting incorrect options
- Three main types (Norman, 1999)
  - Physical
  - cultural
  - Logical

# Physical constraints

- Refer to the way physical objects restrict the movement of things
  - E.g. only one way you can insert a key into a lock
- How many ways can you insert a CD or DVD disk into a computer?
- How physically constraining is this action?
- How does it differ from the insertion of a floppy disk into a computer?

# Affordances

- Refers to an attribute of an object that allows people to know how to use it
  - e.g. a mouse button invites pushing, a door handle affords pulling
- Norman (1988) used the term to discuss the design of everyday objects
  - Learned conventions of arbitrary mappings between action and effect at the interface
  - Some mappings are better than others
- Much popularised in interaction design to discuss how to design interface objects
  - e.g. scrollbars to afford moving up and down, icons to afford clicking on



# Logical constraint



- Exploits people's everyday common sense reasoning about the way the world works
  - Where do you plug the mouse?
  - Where do you plug the keyboard?
  - Top or bottom connector?
  - Do the colour coded icons help?

From: [www.baddesigns.com](http://www.baddesigns.com)

# How to design them more logically



- (i) A provides direct adjacent mapping between icon and connector
- (ii) B provides color coding to associate the connectors with the labels

From: [www.baddesigns.com](http://www.baddesigns.com)

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# Example

The screenshot shows the Microsoft PowerPoint 2007 interface. The main slide content is as follows:

How to design them more logically

- (i) A provides direct adjacent mapping between icon and connector
- (ii) B provides color coding to associate the connectors with the labels

**B.**

From: [www.baddesigns.com](http://www.baddesigns.com)

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Click to add notes

The interface includes a menu with options like 'New Slide', 'Duplicate Slide', 'Slide Number', 'Date and Time...', 'Symbol...', 'Comment', 'Slides from Files...', 'Slides from Outline...', 'Picture', 'Diagram...', 'Text Box', 'Movies and Sounds', 'Chart...', 'Table...', 'Object...', and 'Hyperlink...'. The 'Slide Layout' panel on the right shows various layout options under 'Apply slide layout:' and 'Other Layouts:'.

# Cultural constraints

- Learned arbitrary conventions like red triangles for warning
- Can be universal or culturally specific



# Mapping



A

B

C

D

- Relationship between controls and their movements and the results in the world



# Why is this a better design?



# Consistency

- Design interfaces to have similar operations and use similar elements for similar tasks
- For example:
  - always use ctrl key plus first initial of the command for an operation – ctrl+C, ctrl+S, ctrl+O
- Consistent interfaces are easier to learn and use

# Internal and external consistency

- Internal consistency: designing operations to behave the same within an application
  - Difficult to achieve with complex interfaces
- External consistency: designing operations, interfaces to be the same across applications and devices
  - Very rarely the case, based on different designer's preference - Brand Identity

# Keypad numbers layout

- A case of external inconsistency

(a) phones, remote controls

1	2	3
4	5	6
7	8	9
	0	

(b) calculators, computer keypads

7	8	9
4	5	6
1	2	3
0		

# Usability principles

- Similar to design principles, except more prescriptive
- Used mainly as the basis for evaluating systems
- Provide a framework for heuristic evaluation

# Usability heuristics (Nielsen 2001)

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and standards
- Help users recognize, diagnose and recover from errors
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help and documentation

[http://www.useit.com/papers/heuristic/heuristic\\_list.html](http://www.useit.com/papers/heuristic/heuristic_list.html)

0	I don't agree that this is a usability problem at all
1	Cosmetic problem only. Need not be fixed unless extra time is available on project
2	Minor usability problem: fixing this should be given low priority
3	Major usability problem: important to fix, so should be given high priority
4	Usability catastrophe: imperative to fix this before product can be released

<http://www.useit.com/papers/heuristic/severityrating.html>

# Reflect

- Is it time to bin Nielsen and come up with a new set of usability heuristics?
- <http://www.usability247.com/blog/redefining-user-experience-heuristics-for-smartphone-usability/>



# Recommended reading

- Sharp et al. Chapter 1/15
  - More on design principles
    - Don Norman 1988 The design of everyday things
    - Usability: <http://www.useit.com>  
[http://www.useit.com/papers/heuristic/heuristic\\_list.html](http://www.useit.com/papers/heuristic/heuristic_list.html)
    - <http://designingwebinterfaces.com/6-tips-for-a-great-flex-ux-part-5>
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