Comp 388/441 - Human-Computer Interface Design

Week 5 - 18th February 2016

Dr Nick Hayward

Design for Memory - 1

Design Considerations - Part 1

- ensure interface is designed to reduce or eliminate need to memorise and recall
  - *interface elements etc within structure*
- Don Norman outlines this concept as the notion of
  - ***knowledge in the world** vs **knowledge in the head***
- eg: creating menus or lists of options for users is a good example of
  - ***knowledge in the world***
- user will be able to view the menu, read and recognise options, make selection
  - *no need to recall or memorise related information beyond the basics...*
- this same option on the command line requires memory of command...
  - *user would need to recall **knowledge in the head***
  - *increases potential for error and application issues*

Design for Memory - 2

Design Considerations - Part 2

- we can guide users through sequenced tasks
    - *provision of defined sequence of steps*
    - *guide user through the task flow step by step*
- present forms and controls in a logical and sequential order
- might even consider a **wizard** style interface
    - *user can navigate multiple pages with standard **next** & **previous** links*
- trying to reduce the amount of navigation details required by the user
- thereby reducing the amount the user needs to memorise and recall

Design for Memory - 3

Design Considerations - Part 3

- interface design enhanced with recognisable icons and names
    - *user can easily find interface elements as they scan a list, menu...*
- icons can act as clarifying elements
    - *icons should represent concrete and recognisable things*
- goal is to make it easier for users to create hooks from working to long-term memory
- user should not have to memorise or struggle to recognise unfamiliar icons
    - *defeats the point of using simpler graphical representations*
- if you use abstract, original icons then add some accompanying text to help the user

Design for Memory - 4

Design Considerations - Part 4

- naming schemes & patterns in UIs are also important
    - *helps users remember & recall information*
    - *arbitrary names are harder to recall than representative names*
- non-representative naming schemes may add to user's cognitive burden
- command line interfaces violate this principle on a regular basis
    - *consider Unix commands **more** & **less***

Design for Memory - 5

Design considerations - 5

- good help system and search tool
    - *allows a user to quickly check and recall lost or forgotten information*
    - *user can quickly reference documentation, check usage pattern or concept...*
- in search and index systems
    - *allow users to use variations, synonyms*
    - *user may not remember the exact term, query, spelling...*
- try to avoid personalised terminology for standard UI elements, interaction concepts
- try to avoid using abbreviations or acronyms unless they are obvious or standard practice
    - *eg: **GUI**, **WYSIWYG** are well known examples...*
- be consistent in your UIs application of actions and methods
    - *eg: an action should perform in the same manner from one context to another*

Cognitive Load - I

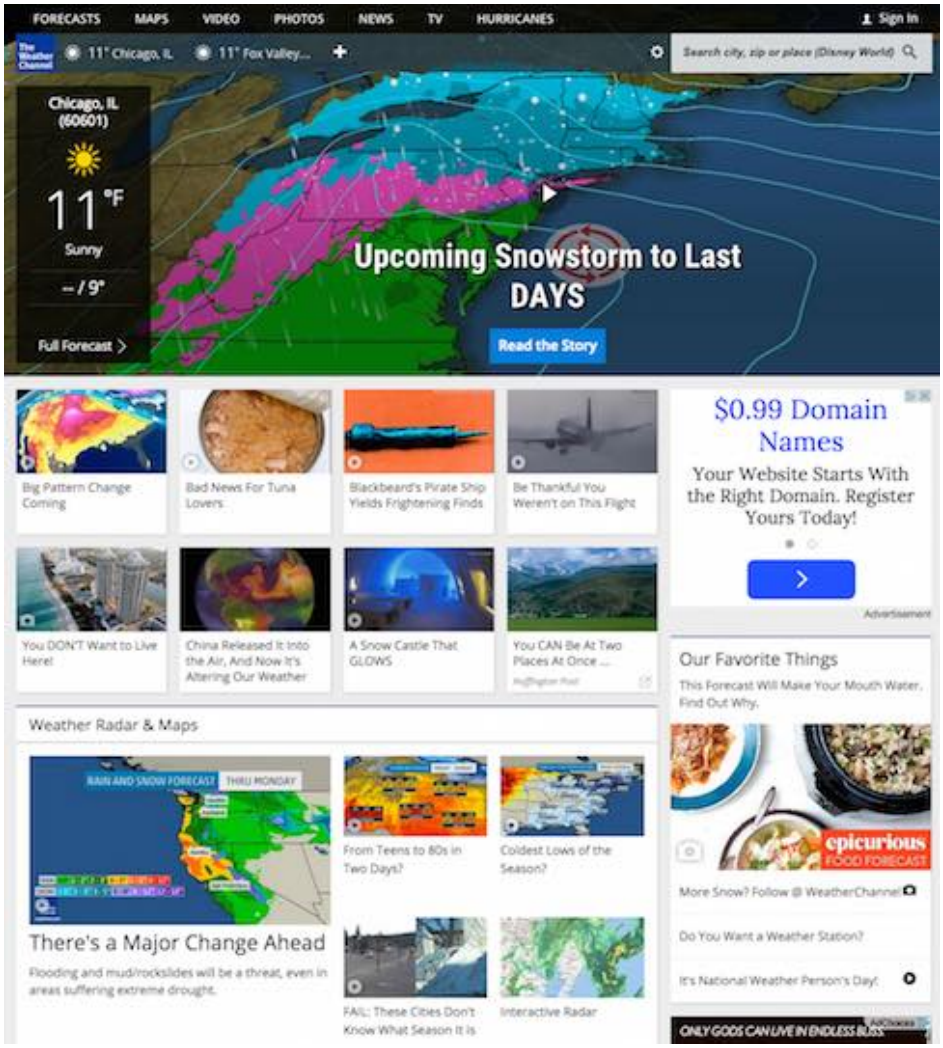
- consider the physical act of interacting with a computer
    - *using a mouse, keyboard, touchscreen...touching, swiping, shaking*
- physical actions incur a cost of time and effort
    - *varying degrees of effort, both physical and mental*
- cognitive load refers to the mental taxation exerted on a user
    - *whilst performing a given task*
    - *refers to amount of sustained attention and cognitive effort required per task*
- the more complex the task, the higher the level of focused attention
    - *cognitive load will be higher as a result*
- good design strategy to try to reduce a user's cognitive load
- try reducing the amount a user has to think about
    - *general concepts, points of interaction, basic navigation, interface elements...*
- "Don't make me think , revisited: A common sense approach to web usability."
    - *Steve Krug, 2014.*

Cognitive Load - 2

Cognitive load may be impacted by the following interactions:

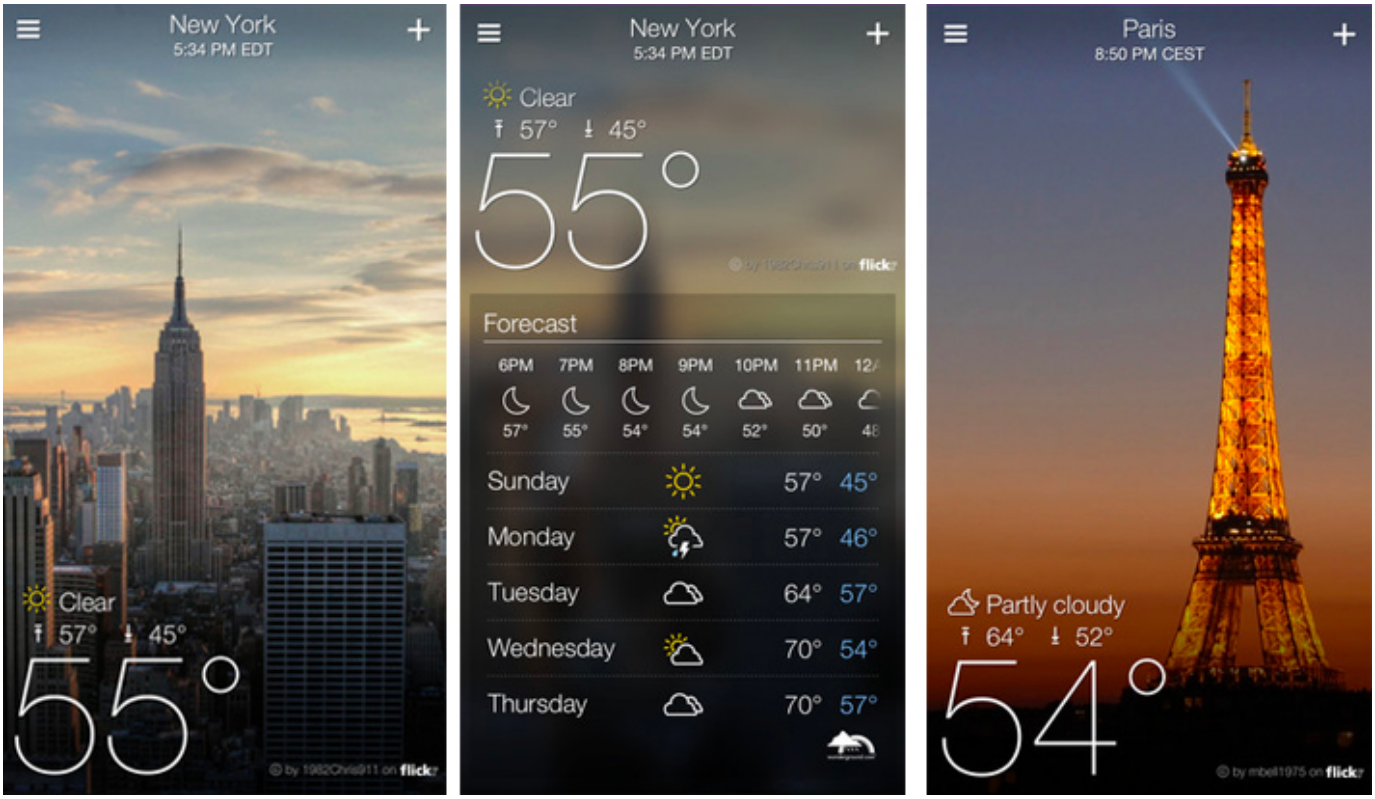
- scrolling, navigating, searching within an application
- choosing options such as menus, lists, forms...
- reading instructions, labels, titles...
- switching contexts (eg: switching between windows, tabs, pages...)
- switching visual attention
    - *reading text, then referring to an image, and then back to the text*
- memory recall for a specific ID, name, action, task sequence...
- simply waiting for the system or application to respond...
- recovering from a specific distraction
    - *such as an interruption not relevant to the current task at hand...*

Cognitive Load - Weather.com



Source - Weather.com

Cognitive Load - Yahoo Weather App



Source - Yahoo! Weather Mobile App

References

- Card, S.K., Moran, T.P. and Newell, A. *The psychology of human-computer interaction*. Lawrence Erlbaum Associates. 1983.
- Krug, S. *Don't make me think, revisited: A common sense approach to web usability*. 3rd Edition. New Riders. 2014.