Comp 388/441 - Human-Computer Interface Design

Week 12 - 7th April 2016

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Violating design principles

- issues that arise in usability
  - *consequence of poor interpretation, implementation, or misunderstanding general design principles*
- reconsider Norman's design principles
  - ***lack of consistency***
  - ***poor visibility***
  - ***poor affordance***
  - ***poor mapping***
  - ***insufficient feedback***
  - ***lack of constraints***

Designing an interaction concept - I

- app's **interaction concept**
  - *basic summary of our base, fundamental idea of how the user interface will actually work*
  - *describes presentation of the UI to the user*
  - *general interaction concepts that allow a user to complete tasks*
- inherent benefit is that it will often highlight initial usability issues
  - *including navigation, workflow, and other carefully considered and planned interactions*
- every aspect cannot be defined and outlined at the initial design stage
- follow a more agile approach instead of formal specification documents
- prototyping a particularly effective method for
  - *testing different design ideas*
  - *receiving feedback through peer reviews and associated usability testing*
  - *representing and communicating intended design to a client etc*
- lightweight written records as supplemental and supporting material

Designing an interaction concept - 2

Analysis of interaction concepts

- interaction styles
- information architecture basics, which often include the following
    - *a data model*
    - *a naming scheme, or defined glossary of preferred names and labels*
    - *a navigation scheme*
    - *a search and indexing scheme*
- an outline of a framework for interactions and workflow
- an outlined concept for transactions and any necessary persistency
- AND, a framework for the general visual design of the application

Designing an interaction style

- app's **interaction style**
  - *fundamental way it presents itself to a user to allow interaction with available functionality*
  - *many different concepts for interaction styles and overlap*
  - *many will employ a variety or combination of these interaction styles*
- an application might present the following styles to its users
  - ***menu driven options*** *- user is able to select options from menus, sub-menus*
  - ***forms*** *- user able to enter data, respond to queries by completing forms*
  - ***control panel options*** *- may show data visualisations, summaries, quick access options*
  - ***command line*** *- allows expert, power users to control the app using commands and queries*
  - ***conversational input*** *- user may interact in a back-and-forth dialogue or conversational style*
    - a sense of question asked and reply returned
  - ***direct manipulation*** *- direct user manipulation of objects within the app on the screen*
  - ***consumption of content*** *- app is simply a way to consume content*
    - eg: e-Book readers, music and video players...
- an app will normally use a combination of the above interaction styles

Designing an interaction style - mobile considerations

Source - Apple iPhone

Designing the information architecture - 1

- concerned with the organisation of information into a perceived coherent structure
- structure is considered comprehensive, navigable, and in many situations searchable
    - *eg: concepts, entities, relationships, functionality, events, content...*
- designing such information architecture requires the following considerations and implementation
    - *data model*
    - *naming scheme or glossary*
    - *names and titles for identification of places*
    - *navigation and location awareness*
    - *navigation map and associated mechanisms*
    - *breadcrumbs and navigation notifications*
    - *presentation of such places*
    - *searching*

Designing the information architecture - visualisations...

Source - Apple Health

Designing the information architecture - 2

Data model, naming scheme, naming places...

- identification and recording of the entities, attributes, and operations for each entity
- also includes identification of the relationships between the entities
- often argued that the data model is, in fact, part of the app's interaction concept
    - *perceived to help define the nature of the product*
- coherent and consistent naming scheme is important to aid user's mental model
- definition of official names for an app's key elements and processes
    - *can be formalised and recorded in the defined interaction concept*
- apps with specialised domains may require a glossary of names and labels
    - *helps define the official, preferred terminology*
    - *interaction concept may then link or reference this glossary*
- places within an app should be clearly named and labelled
    - *helps users determine what they are viewing and where in the app*
    - *helps users differentiate places and concepts within an app*
    - *clear naming of places helps define them in menus, instructions, help text...*
- user-defined place names are OK as well
    - *eg: a title of a document in an editing app*

Designing the information architecture - personal naming schemes

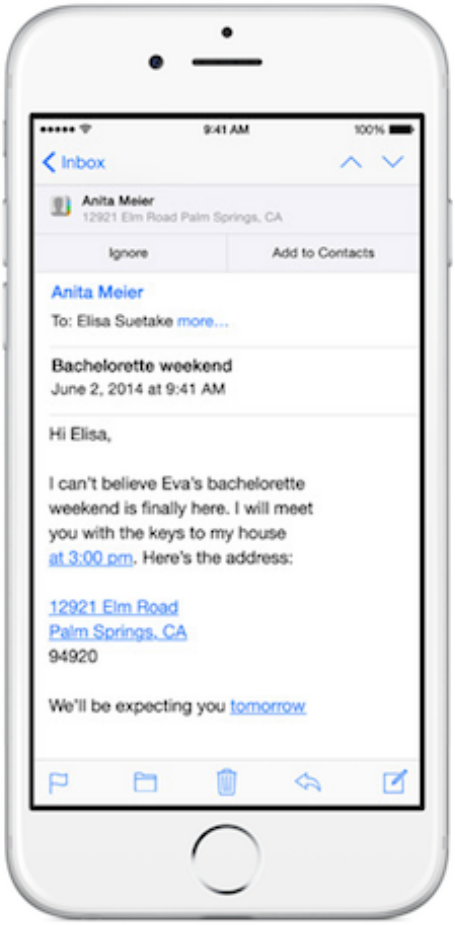
Source - Apple Photos

Designing the information architecture - 3

Navigation and places

- app design often references navigation relative to defined places
  - *eg: in a web app places may be defined as pages or screens*
- not all places need to be user accessible
- places may also refer to sub-divisions such as panels, tabs, sub-sections...
  - *sub-sections may also include dialogs, image presentations etc*
- for apps with many places, a design should help users determine and differentiate
  - *where they are currently located within the app*
  - *where they can go next*
  - *how to easily get where they want to go*
- in addition to naming places, we need to consider their actual presentation as well
  - *how do we present different places to our users*
  - *view multiple places at once, or page/navigate through single places*
  - *can these places be resized, moved and rearranged, opened, closed, hidden, removed entirely...*
  - *can we relate content from one place to another*

Designing the information architecture - determining places



Source - Apple Mail

Designing the information architecture - 4

Navigation map

- allow us to consider and define the places that may exist within our application
    - *the movements allowed from one to the other*
- beneficial if represented in a graphical manner within quick reference diagrams
- designing a complete navigation map at the design stage may be impractical and counter-productive
    - *initial map can always be expanded and modified as we develop the application.*
- some instances where a navigation map is simply impractical
    - *eg: dynamic applications, such as catalogues, wikis, some games...*
    - *many different links, pathways, and related material a user may generate*

Designing the information architecture - 5

Navigation mechanisms

- many different ways for a user to switch places and content. A few defined examples include
  - ***bookmarks***
  - ***buttons***
  - ***events*** *- triggered by a user action or application process can show a notification or message window*
  - ***flow diagrams*** *- visualise steps and outcomes relative to the current complex process or workflow*
  - ***hierarchical structures*** *- eg: trees used to display hierarchical depth of data...*
  - ***history***
  - ***links***
  - ***maps*** *- data points represented geographically, or conceptual map of data, app domain...*
  - ***menus***
  - ***searching*** *- simple act of searching by keyword, selecting from a faceted list of terms...*
  - ***switching*** *- move between multiple places currently available within the UI*

Designing the information architecture - 6

User location

- clearly identify a user's current location
- acts as a quick reminder to the user
    - *also creates a familiar contextual placeholder within the app*
- indicate the user's current location in a number of different ways
    - *clearly display the title or name of the current place with any associated contextual name*
    - *highlight the current place name or title on a visual map or flow diagram*
    - *include a representation of location on a visual flow diagram for a process of series of tasks*
    - *locate a current place within a defined hierarchical structure*
        - such as a tree representation of the current document or data...
- breadcrumb trail useful for hierarchical data representations
    - *benefit of acting as both location indicator and simple form of navigation*

Designing the information architecture - user location

Source - Apple Keynote

References

- Card, S.K., Moran, T.P. and Newell, A. *The psychology of human-computer interaction.* Lawrence Erlbaum Associates. 1983.
- Cooper, A. et al. *About Face 3: The essentials of interaction design.* Wiley. 2007.