

## **Comp 34I/44I - HCI - Slides**

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Spring Semester 2018 - week 3

Dr Nick Hayward

# Vision & Interfaces

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## positive highlighting and focus

- peripheral vision useful as a trigger for the fovea to focus
- moving, overt objects and triggers quickly draw the fovea's attention
- *searching* is another important role for our vision
  - *peripheral vision plays key role*
  - *dependent upon search target, style, colour, movement...*
- design can help our vision focus upon search target
  - *text decoration, highlighting, weight, emphasis...*
  - *bold that **pops***

### text example I

#### Test I

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### text example 2

#### Test 2

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## Vision & Interfaces

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### text example 3

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# Image - Vision & Interfaces

## web safe & browser colours

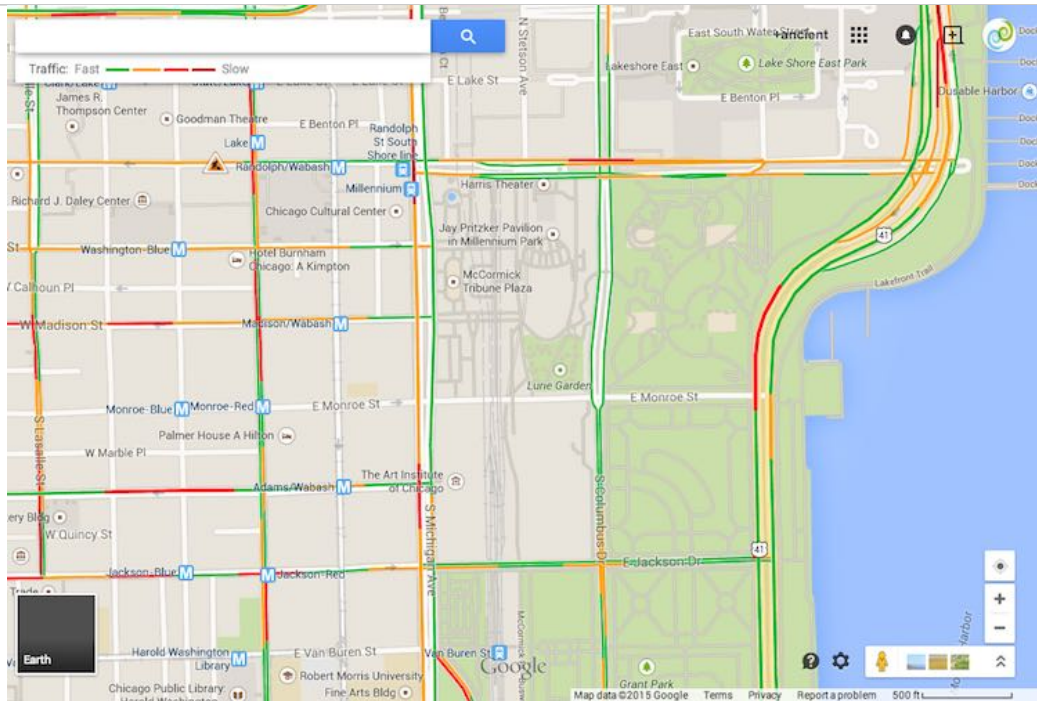


Safe Colours

## Browser colours & colour blindness (source: VisiBone)

# Image - Vision & Interfaces

design pop...

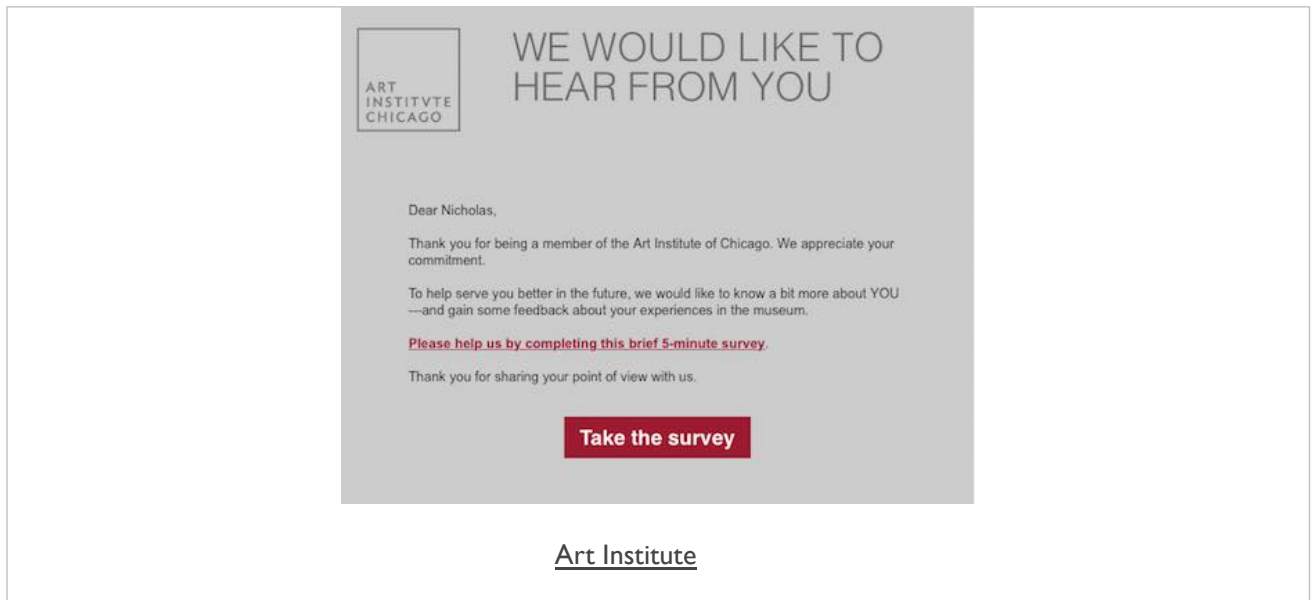


Traffic

# Image - Vision & Interfaces

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## design example



## Email Survey - (source: Art Institute Chicago)



# Users & Interaction

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## consideration of interaction

- GUIs tend to present graphical controls for user interaction
  - *buttons, drop-down boxes and menus, sliders...*
- users interact either directly or indirectly
  - *gesturing on a touchscreen...*
  - *pointing device such as a mouse, keyboard...*
- inherent assumption users know required actions for a given application

# Users & Interaction

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## hierarchical breakdown

- normally a predictable model involving a hierarchical breakdown
  - **goals:** *user's high-level goal for interaction with application*
    - write a letter, take a photo, read a book, book a holiday...
    - goals become **what** the user wants to do
    - instead of **how** they will do it
  - **tasks:** *allow a user to fulfill their goals*
    - perform some general steps
    - follow a structured path of activities
  - **actions:** *user carries out their tasks by performing interface actions*
    - specific operations in the user interface
    - click a button, select a menu item, drag and drop an element, text entry...

### example

### Example - user editing of photo metadata within image library application

- users wants to edit some metadata for a photo in their image library application
  - *open the required image document in image application*
  - *select a menu item to view the current metadata record*
  - *edit existing text entries in the metadata record*
  - *enter new text for missing data*
  - *spell check user input*
  - *preview the updated image metadata*
  - *tag or categorise the image*

## Users & Interaction

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### example

Example - user editing of photo metadata within image library application

- click a menu item to select metadata record
- click on *edit* option to start modifying record
- delete some data from the record
- enter some new text data
- click the *update* or **save** button to close the metadata record

# Users & Interaction

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## patterns emerging

- important to realise and understand is that a predictable pattern emerges
- **goals** often achieved by means of various sets of **tasks**
- **tasks** often be achieved by various sets of **actions**
- such interface patterns can be achieved in multiple ways
  - e.g. *both keyboard shortcuts and mouse inputs*
- pattern from **goal** to **task** to **action**
  - *will, more often than not, be the same*
- necessary to keep such actions flexible and re-usable
  - *combine and mix them to achieve multiple disparate tasks*

## Video - Users & Interaction

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### **filter photos based on metadata**

- Filter photographs based on metadata
- Source: Adobe Lightroom Tutorials

## stages of action

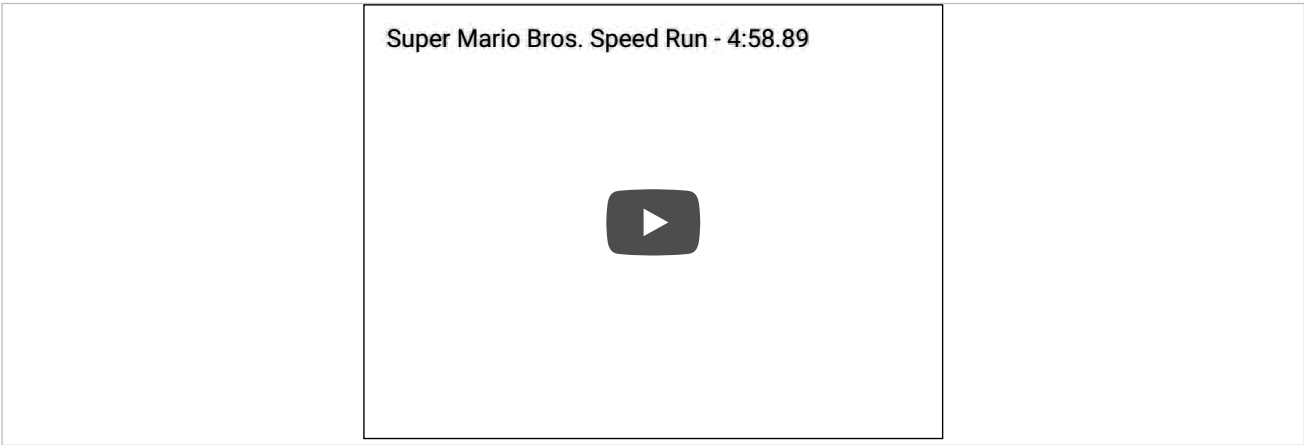
### Stages of Action

- tends to be easier and quicker for experienced users
  - *tasks are known to achieve goal*
- new users more hesitant at first
  - *uncertain of the required actions to accomplish a task*
  - *may be uncertain of the tasks necessary to achieve their goal*
- some users consult documentation, online tutorials, help forums...
- many simply begin with exploratory approach
- user may continue cycle of exploration through application
- continue until goal completed satisfactorily
  - *or, until the user gets stuck and can't move on*

# Video - Users & Interaction

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## Super Mario Bros. speed run




Super Mario Bros. Speed Run - 4:58.89 - Source: [YouTube](#)



# Video - Users & Interaction

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## Super Mario Bros. standard play

	<div>NES Game: Super Mario Bros. (1985 Nintendo)</div> <div></div>	
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NES Game: Super Mario Bros. (1985 Nintendo) - Source: YouTube

# Users & Interaction

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## seven-stage action cycle model

- formalised model named **Seven-Stage Action Cycle Model**
  - Norman, D. *The Design of Everyday Things*. Basic Books. 2013.
- the model consisted of the following steps:
  1. *Identifying an immediate goal*
  2. *Forming an intention to act*
  3. *Determining a plan of specific actions*
  4. *Carrying out the actions*
  5. *Observing the results by perceiving the state of the system and the world*
  6. *Interpreting the results*
  7. *Evaluating whether the actions had the desired results*

# Users & Mental Models

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## intro

- mental models formed as a user learns tasks within an application
- conceptual representation in our user's mind of how a system works
  - *how to operate an application's interface*
- naturally reflects a user's current stage of learning and understanding
- this understanding is subject to change
  - *changes to reflect new learning, experience...*
  - *may diminish or disappear as a user forgets details over time*
- a user relies on a mental model for an application, scenario..,
- user's will also develop expectations based upon such models
- compare a user's mental model to a system's implementation model
  - *can begin to explain usability issues and problems*

# Users & Mental Models

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## elements of a mental model relative to apps & UIs

1. interface appearance
2. interface concepts, syntax, general rules...
3. navigation map
4. plans and strategies for accomplishing tasks and reacting to problems &c.
5. heuristics, conventions...
6. perception of application's implementation model

# Users & Mental Models

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## interface appearance

- users form visual images of the **places** they encounter and repeatedly use within an interface
  - e.g. *various pages, screens, tabs, windows...*
- for most users, recall of mental images will be vague and inherently imperfect
  - *excluding those with eidetic memories*
- interface familiarity leads to familiarity with general layout
  - *frequency of use is also important*
- a user is unlikely to be able to sketch in detail an application's interface from a mental model

## Image - Users & Mental Models

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### Super Mario Kart - 1992



Super Mario Kart - 1992

## Image - Users & Mental Models

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### Mario Kart 64 - 1996



Mario Kart 64 - 1996

## Image - Users & Mental Models

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### Mario Kart 7 - 2011



Mario Kart 7 - 2011



# Users & Mental Models

## Mario Kart through the years...

Super Mario Kart - 1992	Mario Kart 64 - 1996	Mario Kart 7 - 2011
		

# Users & Mental Models

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## interface concepts, syntax, general rules...

- application is designed to solve a problem or meet a specific requirement
- syntax and rules required known as either
  - **application domain, business domain, or problem domain**
- **problem domain** may actually be pretty small
- user may only need to know a handful of concepts
- more complex and involved applications can be designed with inherent assumption of
  - *experience and prior-knowledge*
  - *a thorough understanding and awareness of required domain*
- awareness of problem domain gained via
  - *education, training, experience...*
- other applications may need to communicate and highlight their domain's concepts
  - *games, e.g. role-playing and fantasy, often seen as extreme example*
- simpler games also require adaptation to their domain's objects, goals...

# Users & Mental Models

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## interface concepts, syntax, general rules...cont'd

- many scenarios only require a user's cursory understanding of an application
  - *e.g. users may not need to know about URLs to use a web browser*
- semi-automated apps following pre-defined paths reduce user learning curve
  - *online ticket sites, package delivery...*
- many complex applications, e.g. MS Word, still allow a user to get started quickly
  - *users may be unaware, or even care, about advanced options*
  - *learning can be built upon initial, cursory understanding and usage*

# Users & Mental Models

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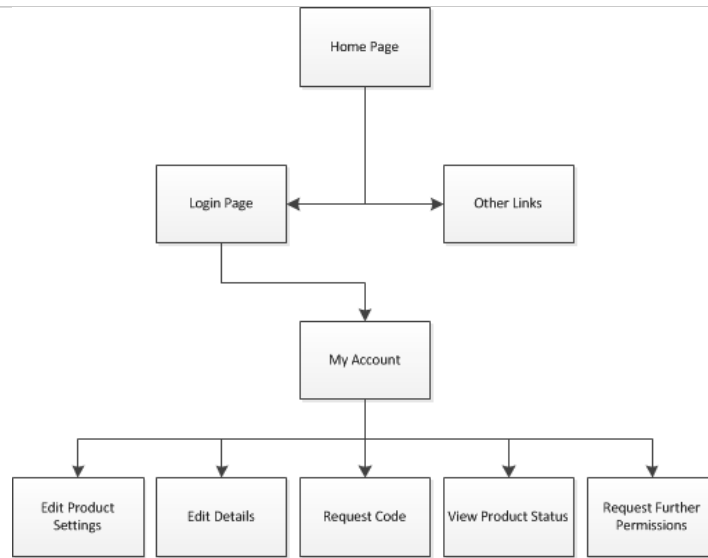
## navigation map

- many applications include the notion of places
  - *pages, screens, tabs, windows...*
- a **navigation map** will be formed by a user
  - *allows a user to differentiate between these places*
  - *return quickly to common places*
- navigation becomes a regular action for users in applications
- maps often applied to comparative applications
  - *expectation of similar usage and interaction*
- multiple options for same location
  - *users may not always be aware of competing routes*
  - *preferred routes often take precedence*

# Image - Navigation Map

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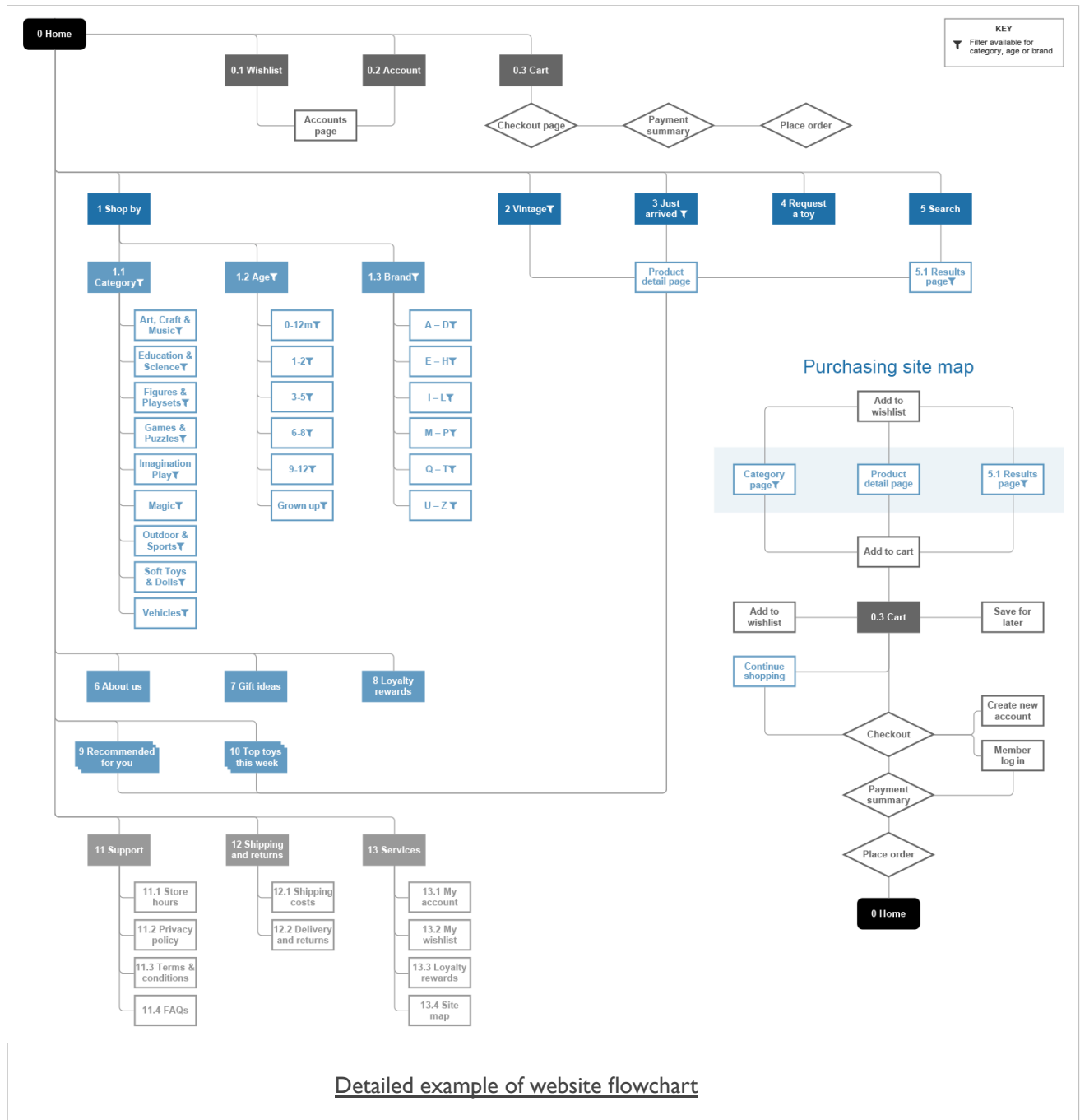
## simple website example



Simple example of website flowchart

# Image - Navigation Map

## detailed website example



## References

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- Norman, D. *The Design of Everyday Things*. Basic Books. 2013.