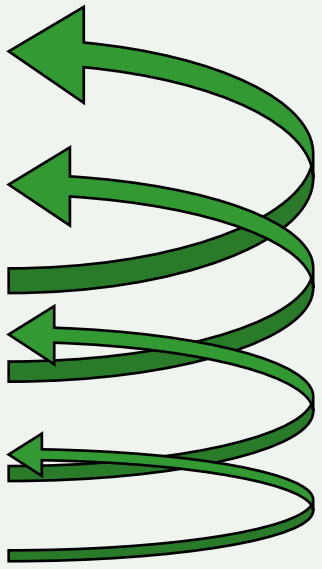
Multimedia Design

Tools and Techniques

Design Tools and Techniques

- Having identified the problem to be solved, the user population, and personas …
- What next?
  - Brainstorming
  - Wireframes and Storyboarding
  - Nav Maps
  - Task analysis
  - Prototyping
  - Testing
  - Delivery



Brainstorming

The term "***Brainstorming***" is commonly used as a generic term for "***Creative Thinking***".

The basis of brainstorming is generating ideas in a group situation based on the principle of...

Brainstorming (2)

Brainstorming is a process that works best with a group of people when you use the following four rules*:

1. Have a well-defined and clearly stated problem
2. Have someone assigned to write down all the ideas as they occur
3. Have the right number of people in the group
4. … (next)

*from Michael Morgan's book *Creative Workforce Innovation*

Brainstorming (3)

4. Have someone in charge to help enforce the following guidelines:

   - Suspend judgment
   - Every idea is accepted and recorded
   - Encourage people to build on the ideas of others
   - Encourage way-out and odd ideas.

Brainstorming (4)

- The whole idea of *brainstorming* is that other people's remarks act to stimulate your own ideas in a sort of chain reaction of ideas.
- Inputs:
  - you may run focus groups to gain information to help your process
  - you might come up with your own ideas and then feed into a group

Brainstorming - The Results

- Select the 5 ideas you like best
- Write down 5 criteria for judging which ideas best solve the problem: "should"
  - "it should be cost effective"
  - "it should be possible to finish on time"
- Give each idea a score from 0 to 5 depending on how well it meets each criteria
- Idea with the highest score wins! But DO NOT throw the other ideas away - your top idea may prove unworkable later on!

The Design Lifecycle

- Brainstorming
- *Wireframes and Storyboards*
- Nav Maps
- Task Analysis
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Wireframe

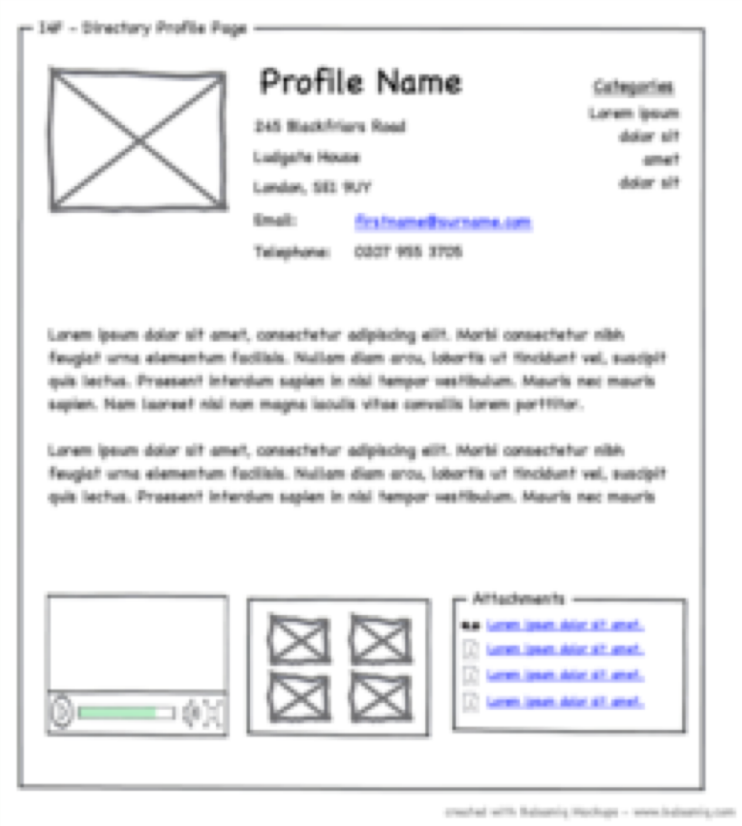
A **wireframe** is a visual guide that represents the skeletal framework of a website or GUI, also known as a page schematic or screen blueprint.

It shows interface elements, nav systems, page layout and how they work together

Generally they have no style information

Focus on functionality, behavior, and priority of content

In other words, it focuses on what a screen does, not what it looks like.



wikipedia

Storyboarding

Storyboarding is exactly what it sounds like. Consider the approach taken from the film industry...

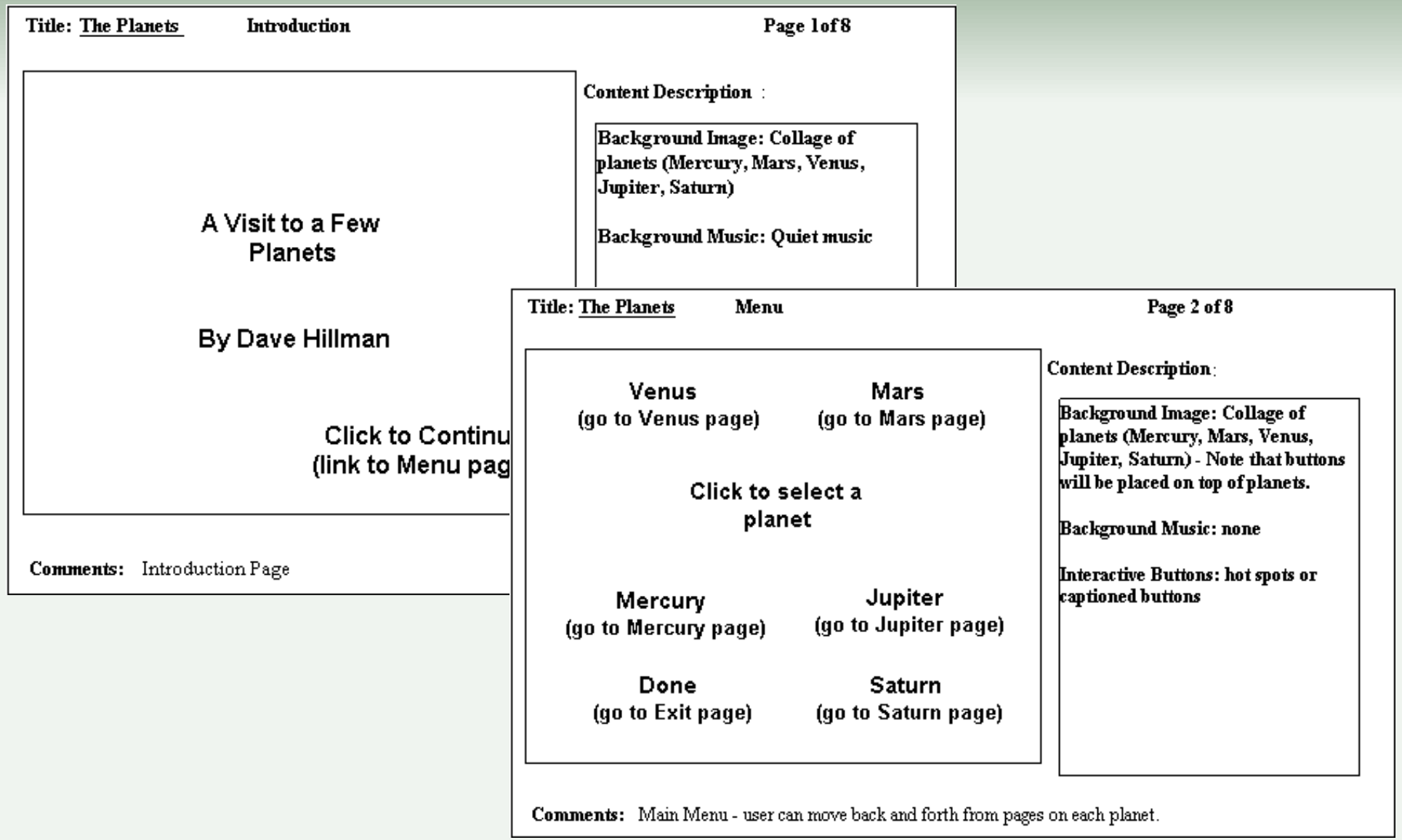
- The writers or directors produce a storyboard for the movies they want to make.
- Each scene is depicted with the actors, their movements, the camera positions etc in enough detail that the crew know what to set up.

This approach can be used for multimedia design.

Storyboarding puts together several wireframes.

Example Storyboards:

http://depts.washington.edu/trio/files/trioquest/ds_storyboard.pdf



Storyboarding (3)

Each screen is documented… "sketched"

It used to be by hand with rough drawings, now you can get software tools which assist the designer…

http://www.powerproduction.com/quick/example/example.html

https://www.storyboardthat.com/

Or go old school with paper, pencil, and maybe coloured pens.

Storyboarding (4)

You sketch out every page or screen of the presentation, highlighting interactions and components such as:

- Description of page
- Text and narration content
- Graphics
- Video: including voice-over script
- 3D/animation
- Audio
- Links to & from
- Any external programs

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Nav Maps

NAVigational **MAPS** are the next stage in developing the overall design of a multimedia project.

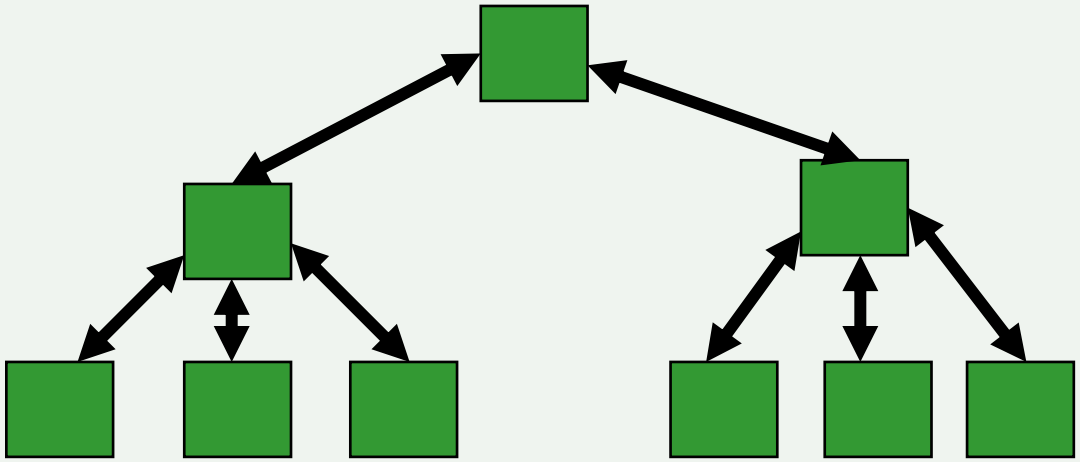
They show how a user will navigate through the various screens and individual elements of the presentation.

This applies to web sites too.

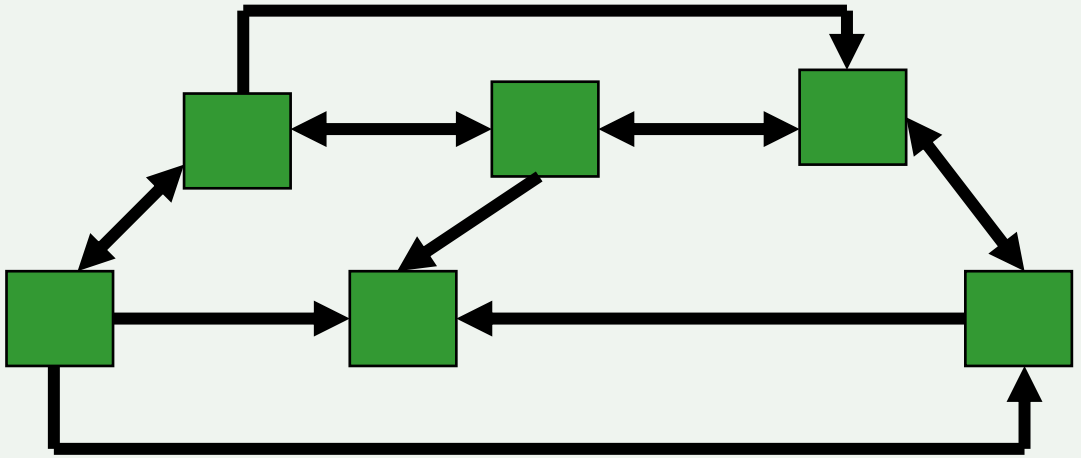
Nav Maps (2)

Linear:

Hierarchical:

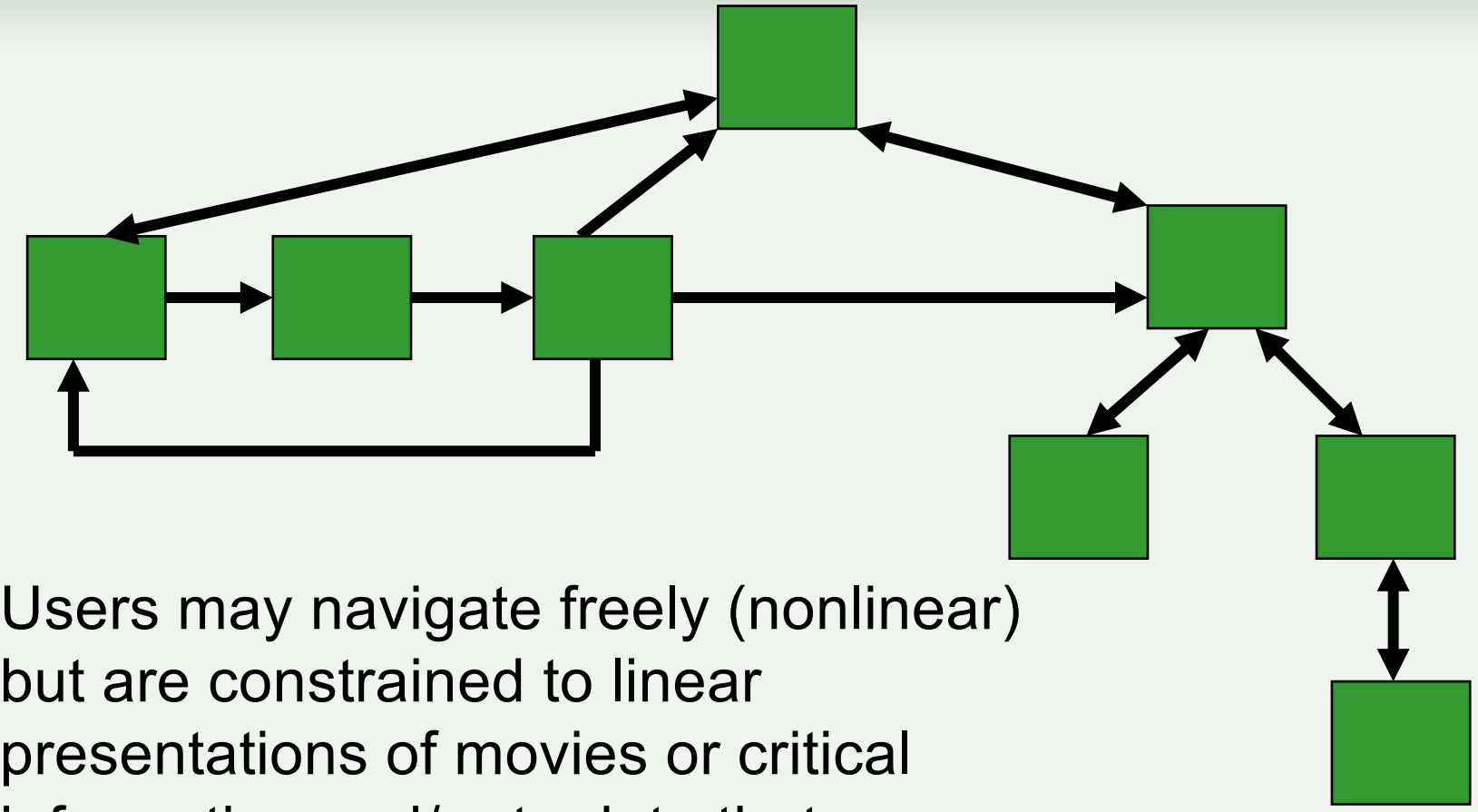


Nonlinear:



Nav Maps (3)

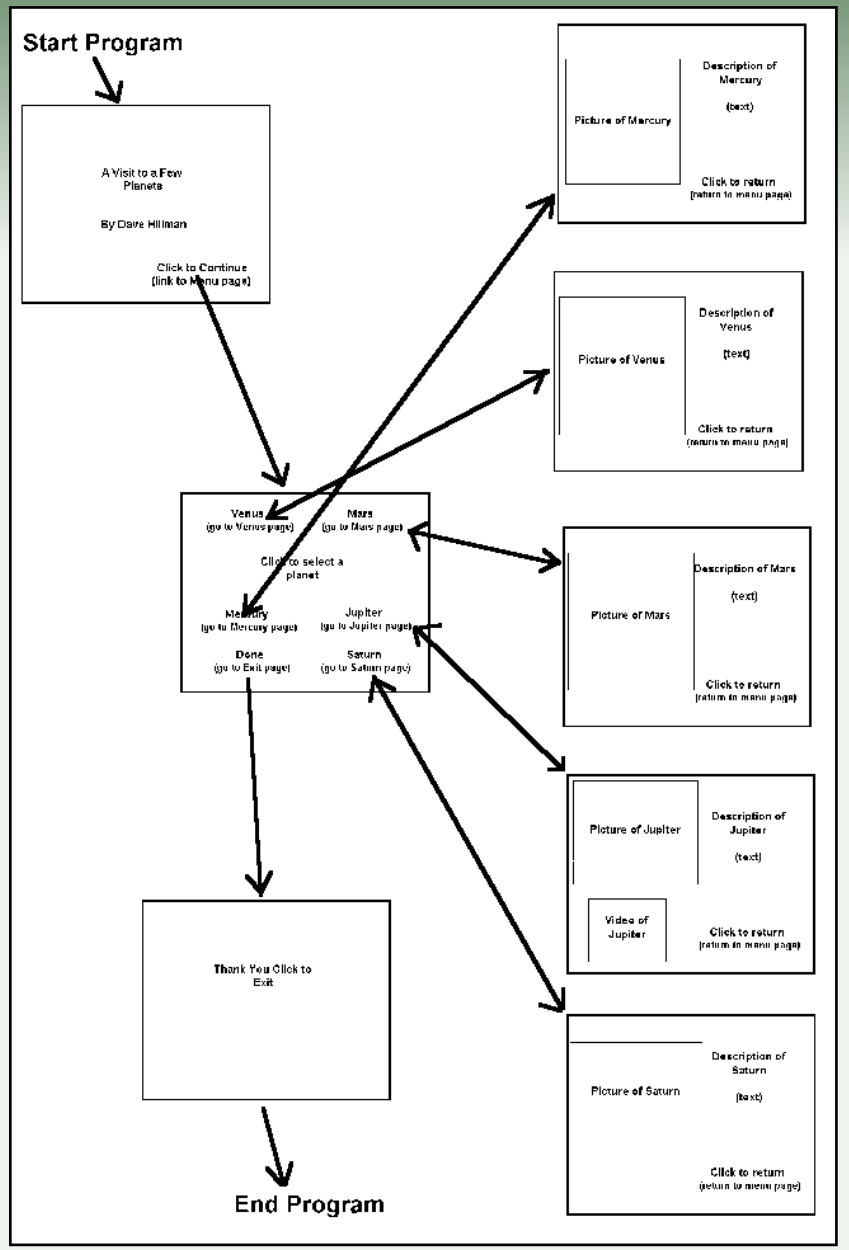
Composite:



Users may navigate freely (nonlinear) but are constrained to linear presentations of movies or critical information and/or to data that are most logically organised in a hierarchy.

Nav Maps and Storyboards

- Nav Maps can often be shown in combination with the storyboards
- Use separate Nav Map when this gets unmanageable on a single sheet of paper



Dave Hillman's template

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Task Analysis

User-centred design (as with design generally, think about users, tasks, personas)

What are the logical, sensible, "easy" tasks that the user wants to do...

> *Can they traverse from A to B simply and easily within 3 clicks or less?*
>
> *Can they find the information on… ?*
>
> *e.g. Find out about the Wallace Monument in a Stirling tourist information system.*

Preece et al, Chapt. 20 pg 409

Goals-Tasks-Actions

- Goal is *driving a car*
- Tasks: start the car, put it in gear, release brake, accelerate, steer
- Actions: insert the key, turn the key, select a gear, press the accelerator, turn the steering wheel

- What happens when someone who has only driven an automatic finds themselves in a manual car?

Preece et al, Chapt. 20 pg 425

Task Analysis

We approach a user-centered design by carrying out a task analysis.

There are 3 basic forms of task analysis:

- Hierarchical task decomposition
- Knowledge analysis of tasks
- Entity-relation based analysis

Hierarchical Task Decomposition

- The task or goal which is set for the user is decomposed into sets of sequential steps.
- *Consider vacuum cleaning a house…*
  - We need to get the vacuum cleaner out
  - Fix the appropriate attachment
  - Plug the cleaner into the socket
  - Clean the rooms
    - hall
    - living rooms
    - bedrooms etc
  - Put the vacuum cleaner and attachments away

Task Decomposition (2)

Identify each step and associated sub-step...

0 In order to clean a house

1 Get the vacuum cleaner out

2 Fix the appropriate attachment

3 Clean the rooms

3.1 clean the hall

3.2 clean the living rooms

3.3 clean the bedrooms

4 Put the vacuum cleaner and attachments away.

Task Decomposition (3)

Our aim in Hierarchical Task Analysis (HTA) is to discover the most meaningful representation of the decomposition structure.

We do this by asking: what sub-tasks must be accomplished in order to perform the main task?

To answer the question we refer to various sources, such as direct observation, expert opinion, documentation and so on...

Knowledge acquisition and analysis

Task Decomposition (4)

When do we stop breaking tasks down?

We need a *"Stopping Rule".*

The level at which we do this will depend on

(a) the purpose of the task analysis

(b) when sub-tasks can be considered actions

Stopping rule: we could apply the following formula:
P (Probability of making a mistake) X C (Cost of mistake made)

- if the value is below a threshold the expansion is stopped.

Task Decomposition (5)

Consider a "First Level" decomposition of what to do in an emergency at a chemical plant:-

0 In an emergency

1 Read the alarms

2 Work out appropriate corrective action

3 Perform corrective action

If our aim is to install computer monitoring of the plant, we would want to expand 1 and 3.

However, if we want to produce on-line operations manuals we would expand 2.

Knowledge Analysis of Tasks

Knowledge-based techniques look at what the users need to know about the objects and actions involved in a task, and how that knowledge is organised.

Knowledge-based task analysis begins by listing all the objects and actions involved in the task and then building taxonomies of these...

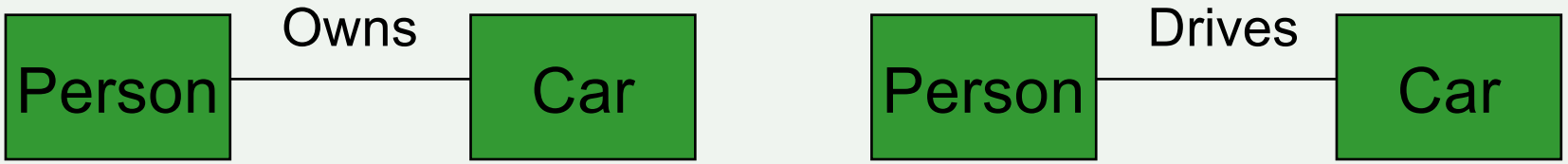
Animals are invertebrates or vertebrates, vertebrates are fish, birds, reptiles, amphibians or mammals etc.

- General organisation of presentation
- Online help

Entity-Relationship Analysis

An object-based approach where the emphasis is on:

- Identifying the actors and objects,
- The relationships between them and
- The actions they perform



Useful for development of nonlinear or composite navigational structures.

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Prototyping

Build a prototype or proof of concept, to demonstrate some functionality to the client

For an object you might use alternative materials, or build at a smaller scale.

For multimedia (and software) we think about

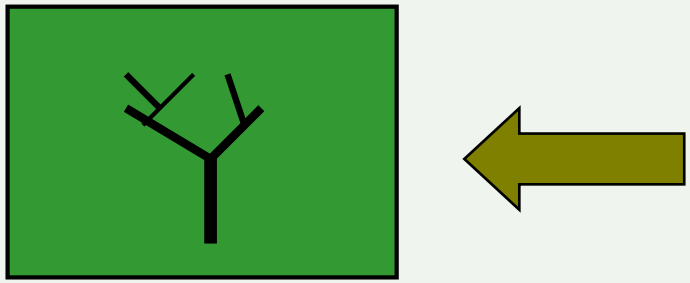
- horizontal prototype: breadth. All the interaction/menus, but limited function
- vertical prototype: depth. Detailed function in some aspect.

Neilsen: Usability Engineering

For the multimedia presentation we use different tools but the objectives are the same...

Building a Prototype

- Collect together what assets you have
  - text, images, video, sound etc
- Create mock-ups of any media that are missing



- Create a prototype presentation based on your storyboards, nav maps and task analysis.

Building a Prototype (2)

- Build enough to demonstrate the "look and feel" of the final system
  - different styles of content and its presentation
  - different methods of navigation and interaction
  - horizontal / vertical prototypes
- Indicate clearly when content is incomplete
  - text box saying "30 second video clip of blah, blah, blah… goes here"
  - popup saying "This path will contain…" when user clicks on a navigational button for an incomplete subsection
- Now you are ready for some testing...

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Testing Your Multimedia System

- Is the same as testing any software system
- Consider
  - Functionality
  - Usability
  - Delivery environment
- Remember to draw on your task analysis to construct useful tests

The Design Lifecycle

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- Testing
- *Delivery*

Delivery to the Client

- This will depend on the goal of the presentation… are we delivering a *web-based* presentation or is it aimed at a *kiosk* (stand-alone installation) or for delivery in a remote location (*CD-Rom*) etc
- Each has its own foibles and pitfalls… the biggest is maintenance and upgrades.

Delivery Methods

- Internet
  - potentially accessed by huge audience
  - access can be very slow
    - streaming techniques for audio and video
  - two-way traffic possible
    - email, forms for feedback
  - easily updated
  - ISP will charge producer by bandwidth usage
    - unless producer has own (expensive) web server
  - ongoing costs to user for Internet access
  - additional commercial opportunities
    - advertising, mailing lists

Delivery Methods (2)

- Intranet
  - (fast) local area network with own web server
  - known user technology
    - bandwidth and browser
  - secure
- Kiosk
  - fixed installation with producer-specified hardware
    - touch sensitive screen
  - hard disks provide high bandwidth and (unlimited) storage
  - must be reliable (perhaps 24 hours a day)
- Electronic presentations
  - maybe stored on laptop PC
  - data projector

Delivery Methods (3)

- DVD / CD-ROM
  - large amounts of storage with fast access
  - playable on most PCs with predictable results
  - always available (providing PC is working!)
  - user has no need for an Internet connection
  - no ongoing costs to user after initial purchase
  - expensive to update: production and distribution

(Useful summary in David Dick's "PC Multimedia & Web Handbook")

End Of Lecture

Homework: develop some initial ideas and user personas for the assignment before the second design tutorial. We will do some testing and brain storming on these.