Design for Interaction

Navigation and Control

Contents

- interface styles
- analysing user tasks
- navigation structures

Graphical User Interface

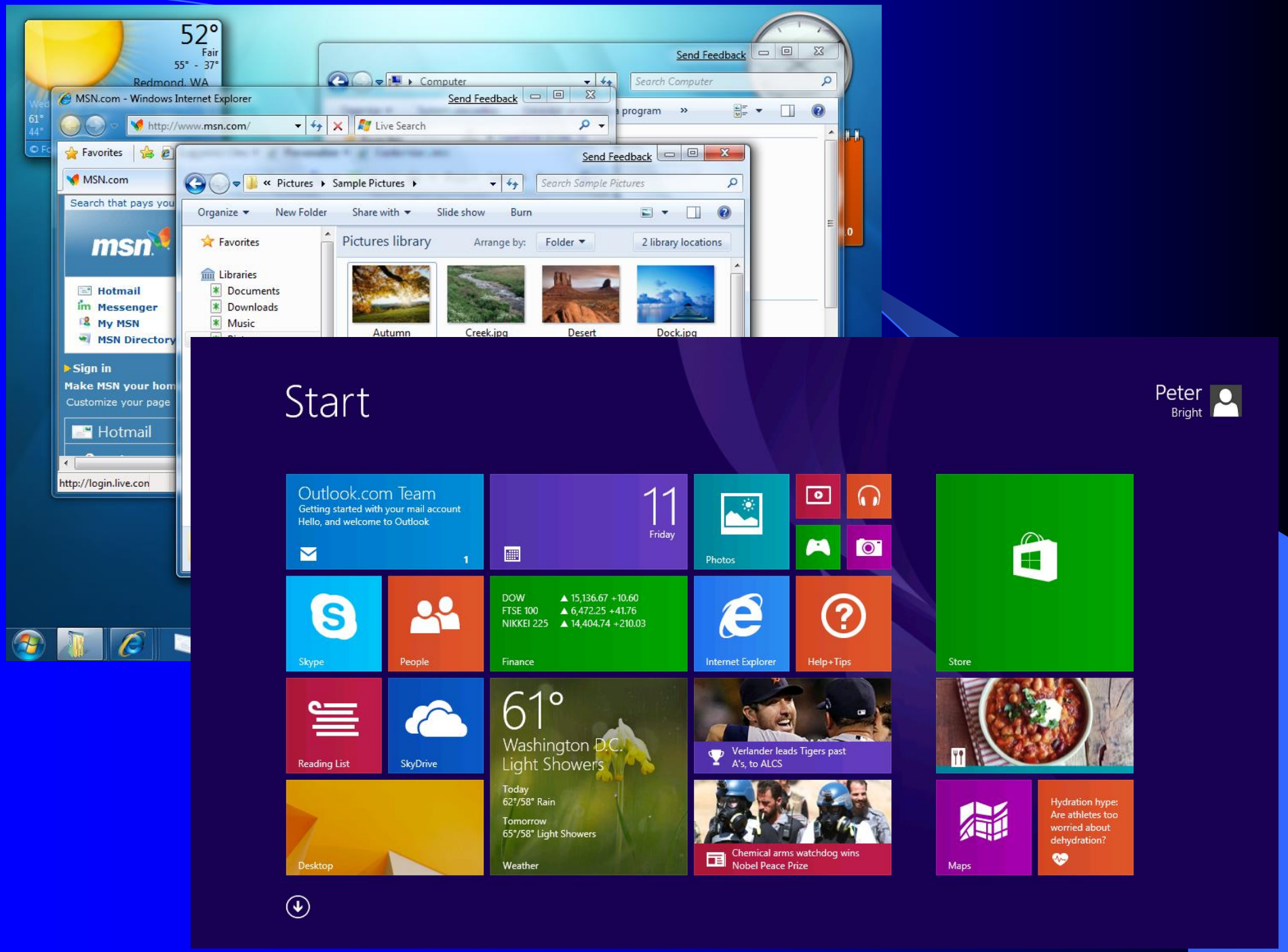
- standard mode of interaction for most computer-based interactive systems
  - also used in many other contexts
- an interface consists of an array of graphical elements (buttons, images, text,…) arranged in a meaningful order
  - spatial arrangement is both a visual and a functional design issue

WIMP Interfaces

- abbreviation for:
  - Window: an area of the screen dedicated to a specific purpose; windows can be moved, closed, hidden behind one another, etc.
  - Icon: a screen element which responds when clicked on with the mouse
  - Menu: any list of available selection options
  - Pointer: a device which allows the user to move an onscreen cursor

Tile-based Interfaces

- updated variation on the WIMP concept
- tiles are usually “flat” panels on a screen
  - unlike traditional windows, the whole tile is clickable (and swipeable)
  - minimised tiles usually arranged in a grid
- best suited to touchscreen platforms
- less successful on more traditional desktop-style devices (eg. Windows 8)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NIKKEI 225 ▲ 14,404.74 +210.03
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Help+Tips
Store
Reading List
SkyDrive
61°
Washington D.C.
Light Showers
Today
62°/58° Rain
Tomorrow
65°/58° Light Showers
Weather
Verlander leads Tigers past A's, to ALCS
Chemical arms watchdog wins Nobel Peace Prize
Desktop
Maps
Hydration hype: Are athletes too worried about dehydration?

Interface Elements

- these concepts are general ones – the actual elements can take a variety of forms
- eg. selection controls (widgets):
  - "simple" button
  - icon
  - checkbox
  - radio button
  - dropdown menu

Interface Elements (2)

- selection grouping controls:
  - menu / menubar
  - toolbar / toolbox
  - palette
- input controls:
  - text field / text window
  - dialogue box
- output controls:
  - system dialogue box
  - status bar

User Actions

- for any interface, there is a defined set of actions available to a user at a given time:
  - select one of the available menu items
  - fill in the options in a dialogue box
  - click ‘OK’ on a dialogue box
  - many more…
- these actions will typically be combined into a sequence intended to produce a useful end result – call this a task

User Tasks

- we can consider tasks from a number of perspectives
- from the user's point of view, it is a goal to be achieved
- from the system's point of view, a completed task is usually a stable state
  - in both cases, the system should help the user to reach this state/goal as efficiently as possible

Task Example 1

- filling in an online form
- initial state: blank form open in the browser window
- final state: completed form submitted and verified
- user actions:
  - selecting (menus / checkboxes / radio buttons)
  - data input (text fields / windows)

Task Example 2

- using a word processor to write a letter
- initial state: opening up the programme with a blank document or letter template
- final state: completed letter saved to file and/or printed out
- user actions:
  - any action permitted by the capabilities of the software and its interface

Comparing the Examples

- what are the main differences between these two examples of interactivity?
  - in the second example, the user has far more options available to them
  - in the second example, the end point is much less clearly defined
- these are both indicative of the relative simplicity of the two tasks
  - ie. the first task is more tightly constrained

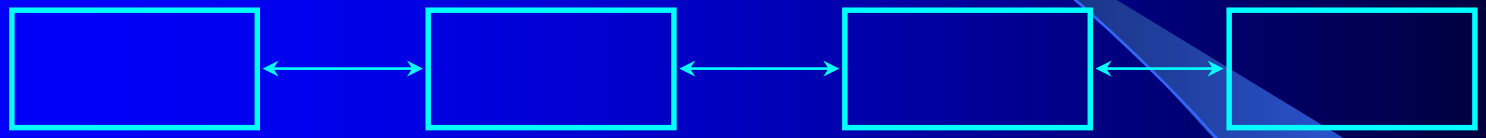
Navigation Structures

- these examples suggest that our interactions with a system are highly task-dependent
- in particular, how constrained a task is will affect how we move around, or navigate, its interface
  - less constrained tasks usually allow us a greater range of options
- this in turn will affect the structure we impose on the system

Basic Structures

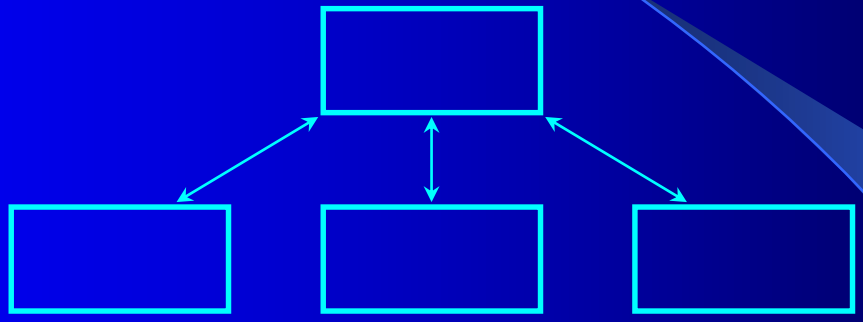
- we can define a number of basic methods for structuring an interactive system:
  - linear
  - hierarchical
  - nonlinear
  - hybrid / composite
- each of these has particular benefits under certain circumstances

Linear



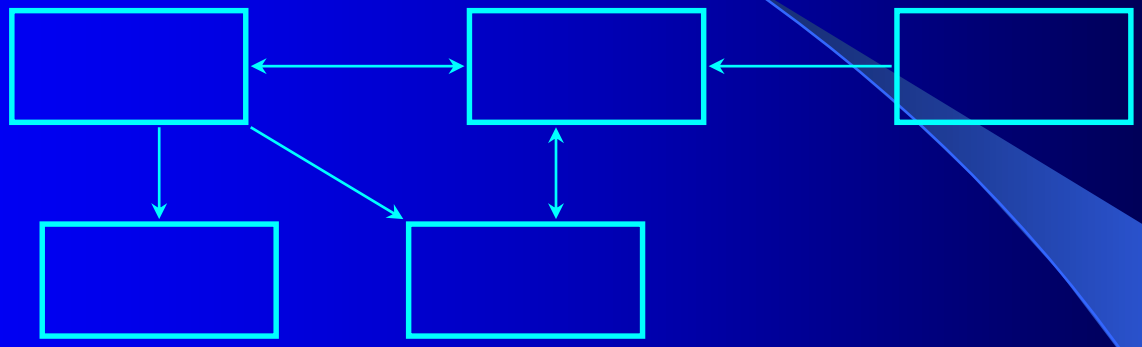
- obviously a very simple structure
- user has the freedom to step forwards (and usually backwards) through a sequence of actions
- mainly relevant to highly constrained tasks

Hierarchical



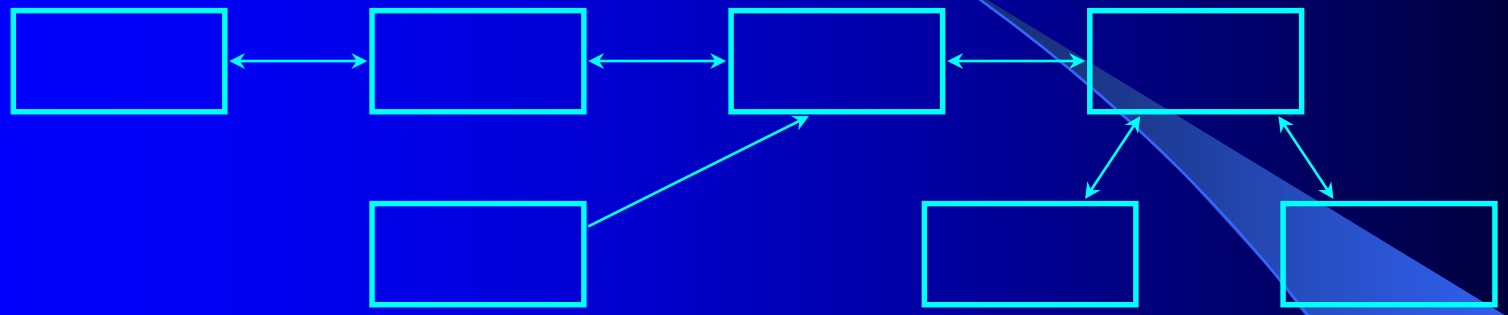
- can extend this to many further levels
- equivalent to a system of nested menus and submenus
- intuitively simple to navigate, but can be very limiting and rigid

Nonlinear



- less logical than either of the two previous structures
- allows greater freedom (or at least, a greater illusion of freedom)
- allows for more complex behaviour

Hybrid / Composite



- can be taken to mean any structure which combines elements of the other types
- many complex applications adopt this approach by necessity
  - cf. letter writing example

Structures and System Goals

- certain structures can be associated with specific types of system goal
- a hierarchical structure may be suited to an information retrieval goal
  - hierarchies allow for logical categorisation
- a system geared towards entertainment may benefit from a nonlinear structure
  - user will feel a degree of freedom and the system will appear less predictable (or dull!)

Structures and Task Complexity

- where a system is primarily task-oriented, the ideal structure may depend on the level of complexity of the task
- relatively simple (and more constrained) tasks may suit a linear structure
- more complex tasks may require greater freedom and maybe a variety of approaches
  - nonlinear or hybrid structure