chapter 21
hypertext, multimedia and
the world-wide web
extract for MSc/MRes AISD
dynamic web content

dynamic web content
what happens where
technology and security
local interaction, search
remote & batch generation
dynamic content

the active web
• early days of the web
  – static pages ... mostly text
  – some gateways (ftp, gopher)
  – usability ... easy - one simple model
    (except frames break the model!)
• dynamic content
  – what is the model/metaphor ???
    • passive pages or active interface
  – each leads to different user understanding
    – no easy answers!

what happens where?
• architectural design is about what happens where
• this affects:
  – feedback
    • seeing results of one's own actions
  – feedthrough
    • seeing effects of other people's actions
  – also affects complexity of implementation and hence maintenance

user view
• what changes?
  – media stream, presentation, content
• by whom?
  – automatic, site author, user
  – other users - feedthrough
• how often?
  – pace of change: days, months, seconds

technology
where does it happen
client
• applets, Flash, JavaScript & DHTML
server
• CGI scripts, Java servlets, JSP, ASP, PHP, etc,
another machine
• author's machine, database server, proxy
people
• socio-technical solutions
security

- for computation
  - code and data at same place!

- problem
  - data - needs to be secure
  - client machine even worse
  - ... and networks!

local interaction (at client)

- fixed content
- use Java applets, Flash, JavaScript+DHTML
- pros: rapid feedback
- cons: only local, no feedthrough, no persistence
- after interaction ... what does 'back' do ??

examples

- coin race uses JavaScript
dancing histograms are a Java applet

search

- create indices off-line
- fast lookup when needed

see http://www.holbook.com/w3/search/

automatic generation

- dilemma;
  - hand crafting ... leads to web stasis!!
  - so need database driven sites
- early days ad hoc, now many tools
- options:
  - client-end applet or Flash access remote DB
  - server-end CGI driven by web forms (limited UI)
- hybrid solutions
  - CGI generated pages can contain JavaScript etc.
  - JavaScript can ‘write’ web pages on the fly!

Java applet & JDBC

- pros: interactive DB access
- cons: bandwidth, security
CGI script accesses database

- pros: up-to-date, use existing DB
- cons: not proxy/index friendly

batch generation

- for slow varying data
  - update local database
  - periodically generate pages and upload
- many technologies
  - C, Java, HyperCard, Visual Basic

batch generation of web pages

- pros: indexable, secure
- cons: slower turnaround

dynamic content

- really 'active' web pages ...
  - data updated as well as presented on the web
- presentation
  - any of the previous means: CGI, applet-JDBC
- update
  - web form/interface -> server script -> update db
    - e.g. book theatre seats
- issues
  - authentication and security
  - multiple transactions due to 'back' button
  - right pace/control – do we want human in the loop?
n-tier architecture

- one or more intermediate layers
- 'business logic' in layers
- web standard components and protocols

local interaction - remote data

- pros: very rich interaction
- cons: coding 'pull' only, asynchronous
  - back, bookmarks, search, ???