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
  - web-server - least secure machine
  - 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
- 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.hcilbook.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

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**batch generation of web pages**

- **pros:** indexable, secure
- **cons:** slower turnaround

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**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?

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**n-tier architecture**

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