HUMAN-COMPUTER INTERACTION THIRD EDITION

DIX FINLAY ABOWD BEALE

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

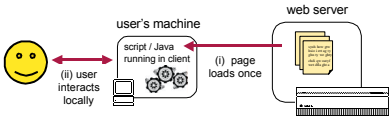
people
- socio-techncal solutions

security

- for computation
  - code and data at same place!
- problem
  - data - needs to be secure
  - web-server - least secure machine
  - client machine even worse

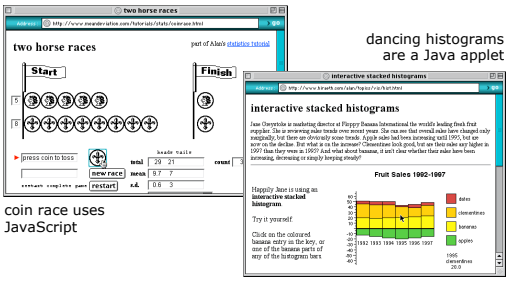
  … and networks!

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 ??

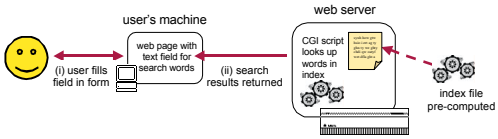
examples



coin race uses JavaScript

dancing histograms are a Java applet

search



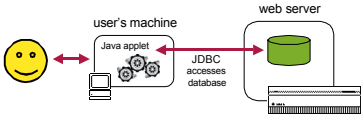
- create indices off-line
- fast lookup when needed

see http://www.hcibook.com/e3/search/

automatic generation

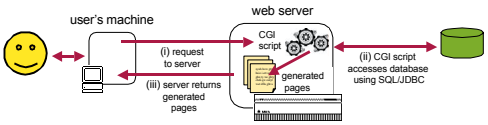
- dilemma;
  - hand crafting … leads to web stasis!!
  - so need database driven sites
- early days ad hoc, now many tools
- options:
  - client-end applet or Flash access remote DB
  - server-end CGI driven by web forms (limited UI)
- hybrid solutions
  - CGI generated pages can contain JavaScript etc.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

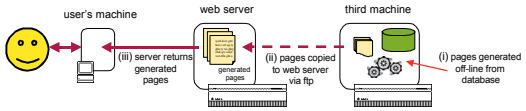
- for slow varying data
  - update local database
  - periodically generate pages and upload
- many technologies
  - C, Java, HyperCard, Visual Basic

```
Set db = openDatabase("C:\test.mdb");
sql = "select Name, Address from Personnel;"
Set query = db.OpenRecordset(sql)
Open "out.html" For Output As #1

Print #1, "<h1>Address List</h1>"
query.MoveFirst
While Not query.EOF
 Print #1, "<p>" & query("Name") & " " & query("Address")
 query.MoveNext
Wend

Close #1
query.Close
```

batch generation of web pages

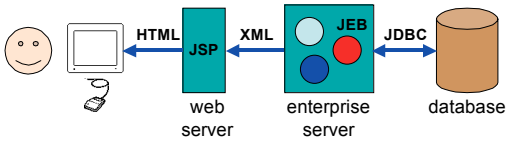


- pros: indexable, secure
- cons: slower turnaround

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