research and innovation

analysing existing work

Alan Dix

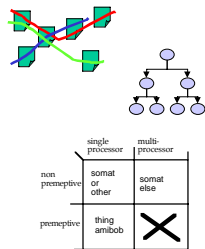STRUCTURE + DIVERGENCE = INNOVATION

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analysing existing work

- **structuring**
  - themes, criteria, classification, etc.

- **understanding**
  - why, why, why, why … and why not?
  - deconstructing

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structuring

- themes
- criteria
- classifications
- taxonomies
- multiple perspectives

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structure what

- whole papers/documents
- issues, topics within docs
- things described
  - software/hardware systems
  - methods/techniques
- application areas
- observed behaviour

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themes

- recurrent topics, issues, problems
  - e.g. power usage in ubicom
- how to find them?
  - you haved 2 minutes
  - tell a friend about the area
  - what would you say?

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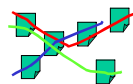
criteria

- mostly for things
  - software, methods, etc.
- often binary
  - can it do X - yes or no
- may be multi-choice
- or qualitiative
  - does it support X - positive, negative, a bit

the instant thesis

- choose an area
- gather literature
- see what criteria each uses
- apply criteria to all systems/methods

classification and taxonomies

☺ standard subject classification
☺ problem specific classification

- boundary cases
  - is a platypus a mammal, bird or reptile?
  - boundaries are constructs
  - hard cases tell us most

finding classes - attributes

- topic:
  genetic algorithms for fingerprint identification
- possible classes:
  - recognition techniques:
    - genetic, statistical, annealing
  - recognition domains:
    - finger print, face, voice

finding classes - comparisons

document A   document B
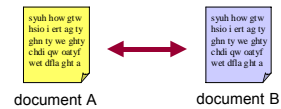
- in what ways are they similar?
- in what ways are they different?

the easy way?

- look in:
  - conference proceedings
  - books
  - special journal issues
  - workshops
  - . . .
  what classifications do they use?
                    ... steal them!

hard cases

- boundary cases
  - is a platypus a mammal, bird or reptile?
  - boundaries are constructs
- outside classification
  - extend classes
- hard cases tell us most

why multiple classifications?
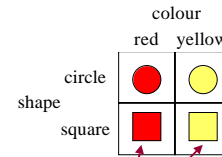
- taxonomy:
  - things
    - circles
      - red circles
      - yellow circles
    - squares
      - red squares
      - yellow squares

similarity clear

similarity obscured

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multiple classification

- shapes
  - circles
  - squares
- colours
  - red
  - yellow

	colour	
	red	yellow
circle	●	○
square	■	▪

shape — circle, square

tell you in what ways things are
similar and in what whay they differ

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an example
groupware on the web

D. Ramduny and A. Dix (1997). **Why, What, Where, When: Architectures for Co-operative work on the WWW.** in *Proceedings of HCI'97*, Eds. H. Thimbleby, B. O'Connaill and P. Thomas. Bristol, UK, Springer. pp. 283-301.

- shared data - where is it?
  - local - on users' own machines
  - remote - on a central server
- but it moves
  - where is it stored?
  - where is it used?

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the data matrix

usage

storage		local	remote
	local	replicas	super-computers ASP
	remote	caching	client-server

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what about code?

- applets a bit like cached data?

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the code matrix

usage/execution

storage		local	remote
	local	download helper plug-in	SQL?
	remote	applet	CGI etc.

code and data

- can be stored sep

attribute spreading

- topic: applications of technique X in area Y
- look at:

  applications of technique X to other areas
  applications of other techniques to area Y