

## Orientation on Empirical Modelling

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## Contrasts in the Uses of Computing

- Functional or personal
- Concurrent or sequential
- Automatic or human-driven

## Functional or Personal

The use of applications that is **functional** is most common:

Office applications, entertainment, information, control, communication, programming, compiling

The use of applications in a way that is **personal** is common but less discussed:

exploration (by spreadsheet for example), understanding (e.g. visualisation of an engine), imagination ( design, learning, creativity etc)

## Reflection 1

- Is it the **application** that is functional or personal?, or the **way of using** it? Can you use an application in a way that is both functional and personal?
- Is this distinction 'functional or personal' a genuine distinction or just artificial? If genuine, how would you best explain it?
- Can you think of other ways of using computing?

## Concurrent or Sequential

- Human experience is essentially concurrent
- Classical computing is sequential with only interleaving 'models' of concurrency
- The spreadsheet-like modelling of EM lends itself to concurrent evaluation
- The ODA framework supports the concurrent view with LSD analysis and ADM implementation

## Reflection 2

- In what ways are current applications becoming more concurrent?
- Why has concurrency been so difficult in a computing context?
- Is there any sense in which concurrency is simpler than sequential processing?

## Automatic or human-driven

Better be automatic (examples):

- Micro-trading on currencies
- Processing astronomical data
- Engine management systems

Better be human-driven (examples):

- Decision-support: investment / medical
- Design / creativity decisions
- Learning processes

## Reflection 3

- The computing community seems divided between those who strive to 'get the human out of the loop' and those who oppose that. Need it be exclusively one or the other?
- Why is it so difficult to keep the human involved alongside computing processes?
- Are there actually any examples (yet) of 'artificial intelligence'?

## Empirical Modelling ...

- ... has its focus on the personal, the concurrent and the human-driven. In this way it is overlapping with many current developments in computing.
- ... also embraces the functional, sequential and automatic as essential features of some software.
- ... can be carried out with many kinds of software and even without software.