Modelling and ISD

Lecturers
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Pass requirements
- 50% or more of the total available marks in addition, these conditions apply
- minimum 40% of the examination marks
- minimum 40% of the assignment marks

Contents
- Welcome, Introductions and housekeeping
- Approach
- What is Modelling?

Unit outline
- Unit home page http://www.sims.monash.edu.au/subjects/IMS5024
- Objectives
- Assessment
- Pass requirements
- the astute student

The Astute Student will:
- attend every lecture and every tutorial
- read the reference material before lectures and tutorials
- listen to what the lecturers say
- NOT memorise the overhead slides, but instead, investigate and form opinions about the slide topics
- ask questions
Assessment

- Modelling research report
  - Synopsis for evaluation in week 3
  - Due Week 6

- Object oriented modelling assignment
  - Due Week 11

- Exam

Pitfalls

- Read website regularly for updates on reading, class assignments and announcements

- Plagiarism
  [link](http://www.sims.monash.edu.au/policies/plagiarism.html)

  offenders will get caught

Reading

- **Lecture 1:**

- **Lecture 2:**

What is a model?

- **Mathematical**
  - an equation; (eg. $E=mc^2$)

- **Symbolic/Visual**
  - a theory; (eg. the theory of relativity)
  - a hypothesis; (eg. the speed of light is not a limiting velocity)
  - an analogy; (eg. a map)

- **Physical/Iconic**
  - an artefact; (eg. a model car)

The nature of models

1. Scaling Down; both in terms of size and complexity
2. Transfer Across; representation in relative position
3. Workability; in principle the model operates like the original as a consequence of 1&2
4. Appropriateness; to the aspect of reality under investigation

The pathology of modelling

The model is the reality

The model represents all of reality
Why models are used

Models are an agreed "language" by which a diverse group can communicate about an essential aspect of the "Universe of Discourse" (UoD)

It facilitates communication, and shared understanding, between people who have a different perspective about an aspect of reality in which they have mutual interest.

Models as a means of communication

- A descriptive, narrative model - the big picture
- An aesthetic model - what will it look like
- An environmental model - where does it fit into the world
- A designer's model - how does it fit together
- A fabricator's model - what components are needed
- A builder's model - what do we have to build it on
- A constructor's model - how do we put it together

The problem of communication: views from the coalface

What is systems development?

Systems development is the process of modelling those aspects of the user's physical requirements which can take advantage of the things a computer can do. The art of the analyst/designer is to convert what the users need to support their work into the form of instructions which a computer can follow.

The Discourse of ISD

Strengths & weaknesses of ALL forms of modelling

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>Simplify</td>
<td>Incomprehensible (to some audiences)</td>
</tr>
<tr>
<td>Relate to particular purposes</td>
<td>Inaccurate (for some things)</td>
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No single model can accurately communicate information about ALL aspects of an information system.
The concept of the logical equivalence

The analyst is interested in the “essential” model that depicts the essence of the system; what it must do independent of the technology or the actual system.

To achieve this the analyst engages in a process of abstraction, which also includes generalisation, to identify the logical equivalent of the physical world. When modelled, such logical equivalents are called logical or conceptual models.

The significance of conceptual models is that software can only represent such models and not the physical world.

Implications of systems modelling

- engineering systems are much easier to model than information systems
- what gets modelled is what gets built (and remember all models omit some detail)
- some things are easier to model than others
- some things are un-modelable
- some models are un-buildable
- systems development requires a large variety of models to meet the needs of different audiences

Using Models

The analyst needs to:
- beware of simple modelling solutions (real organisations are not simple)
- think about the things which are too complex and/or can’t be modelled
- beware of ‘engineering’ approaches to non-engineering systems