

# The Role of Modelling

## Definition: Model

A model is something that provides an abstraction of a solution, capturing its essential characteristics and omitting unnecessary detail

- We use models to help produce solutions for both WSPs and also ISPs

## 1 Why do we need to model?

- Complexity and size of software products means we need abstractions (models) to help predict how desired characteristics will be realised in the actual product
- So we use models to support such activities as:
  - Requirements elicitation and specification
  - Design of systems and applications
  - Costing and planning
  - Risk assessment
- An important role for models in designing is that they help manage the cognitive load for large applications

## 2 How do we develop a model

- Ideas about architecture can help with deciding what form of model we want to create
- Frameworks such as design patterns can help with organising the detailed structure of a model

## Important: Models

Creating models is an iterative process, we rarely get it right first time. It's a bit like programming

## 3 Perspectives and Viewpoints

### Definition: Perspective

Relates to a software development role. Each has their own set of interests and needs

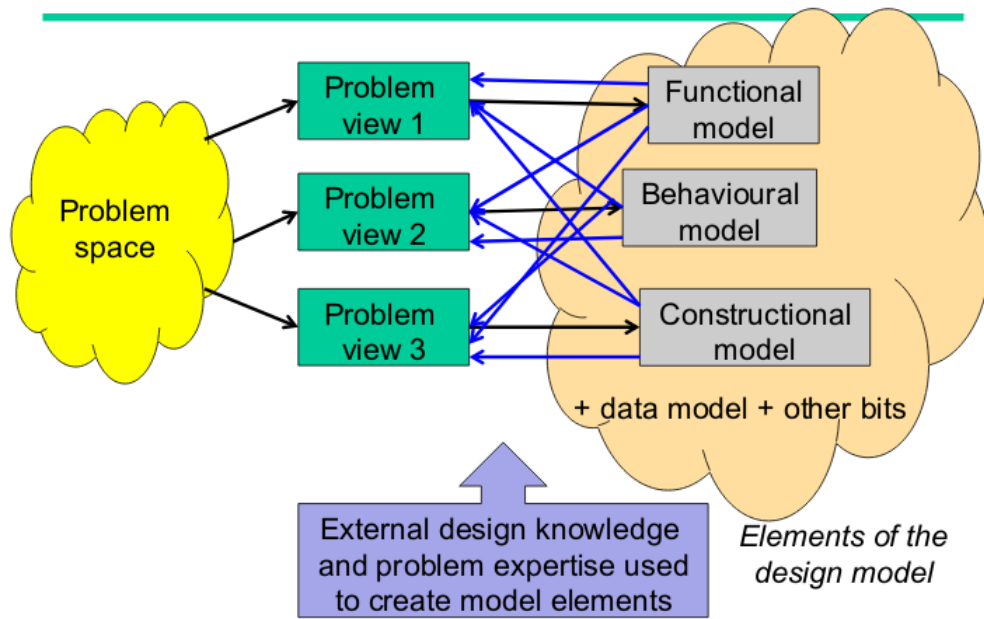
### Definition: Viewpoint

A set of particular characteristics or attributes of a model, which in turn embody some specific aspect of software. A specific viewpoint is usually described by using one or more particular representations

### 3.1 Design viewpoints

- An abstraction essentially "omits properties other than those of immediate interest"
- A viewpoint therefore focuses on a set of design attributes that relate to a particular abstraction
- The viewpoints we care about are:
  - **Constructional** - Describing static properties and constructional details
  - **Behavioural** - Describing the causal links between events and system responses
  - **Functional** - describing the operations performed
  - **Data modelling** - describing the forms of data elements and the relations between them

## 4 Software as an ISP



## 5 Interconnectedness

The viewpoints can be considered to be "projections" of the model, and are not independent

## 6 Representations

- Provide the abstract descriptions we use in our models. A representation usually describes the attributes of the model that are related