Modelling Languages

CONCEPTUAL DATA MODELLING

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Modelling language

• A Modelling language is a collection of modelling techniques

• the Unified Modelling Language (UML) is a collection of over 9 different modelling techniques
  1. Class diagrams
  2. ...
  3. ...

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Modelling technique
Models are written in a “modelling technique” = collection of symbols + composition rules

• Example
  • BPMN Process diagrams
Modelling techniques

• Modeling techniques range from purely textual to purely formal.

**Purely textual**

**Register a new member**

**Description:**
Registration of a new member

**Precondition:**
Member does not exist yet.

**Steps:**
- Input the member's details into the system
- Checks uniqueness of member
- Register member in the system

**Use Case 1:**
Register Member

**UML CD**
Modelling techniques

• There is a plentitude of modelling techniques for IS
  • Entity Relationship Modelling
  • UML Class diagram
  • UML State chart
  • Flow Charts
  • Process Diagrams
  • Petri Nets
  • Event Process Chains (EPC)
  • ...
Modelling techniques

• Different models are used for different phases and different viewpoints

  • Phase
    Abstract/Conceptual
    Implementation Agnostic
    Detailed
    Implementation Oriented

  • Viewpoints
    Data perspective
    Behavioural perspective
    Interaction perspective

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Modelling techniques

• Some techniques address the same viewpoint & phase, but use different symbols

• Business process modelling
  • BPMN Process diagrams
  • Petri Nets

• Conceptual data modelling
  • ER modelling
  • UML Class diagram

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Modelling techniques

Sometimes the same technique is used through different phases

UML class diagram used for conceptual modelling
versus
UML class diagram used for program design

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Data modelling techniques

Extended Entity Relationship modelling

- Invented by Peter Chen for the conceptual design of databases.
- Later extended with insights from semantic modelling

Extended Entity Relation (EER) modelling
Data modelling techniques

• Information Engineering (Crow's foot notation)
Data modelling techniques

• UML Class Diagram
  • Part of Unified Modelling Language
  • Originates from Object Oriented Programming
  • Represents data aspect of classes
Data modelling techniques

EER

Entity

(0..1) (0..n)

UML

Class

0..1 0..*

Information Engineering

Entity

(1..1) (1..n)

1..1 1..*

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