

# Interactive Situation Models For Information System Development

Authors: Meurig Beynon, Richard Cartwright, Pi-Hwa Sun, Ashley Ward.

Presented by:

Jaratsri Runggratananubol

Department of Computer Science  
University of Warwick, England.

## Major theme of this paper

Conventional OOSE: Unified Modeling Language  
UML uses *static* artefacts

Aim of paper: To show the potential advantages of using *dynamic* or interactive artefacts in the design process

Idea: Have a different approach to modelling -- *observation* - rather than object-oriented

## UML (Unified Modeling Language)

A modelling language to help in designing Object Oriented applications

Two basic kinds of diagram

- *Class diagrams* - these describe the types of objects and various kinds of static relations between them
- *Interaction diagrams* - these describe how groups of objects collaborate in some behaviour (e.g. statecharts)

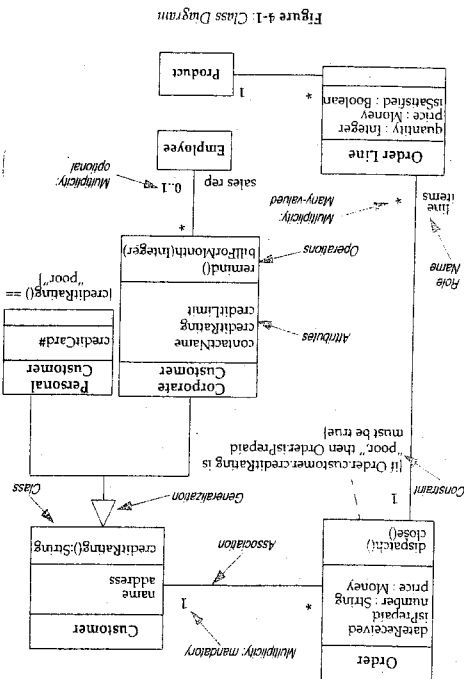


Figure 4-1 shows a typical class diagram.

This diagram has been taken from UML. Distilled: Applying the standard Object Modeling Language by Martin Fowler with Kendall Scott, Addison-Wesley 1997, p. 34.

## Particular focus of study

- Special area of software design viz. user-interface (UI) design
- Particular aspect of the software specification, viz. state-transition modelling using statecharts
- Addressing specific problem raised by HORROCKS viz. USER-INTERFACE REVISION

4

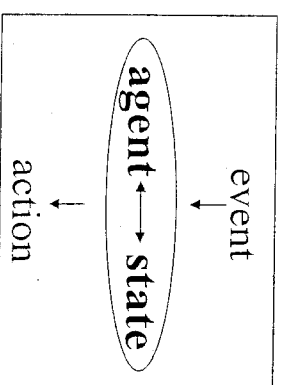
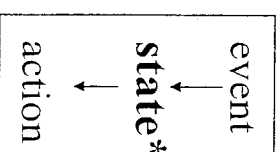
## The UI Revision problem (HORROCKS)

- Large interfaces need maintenance, revision, extension, re-engineering ...
- Common practice in user-interface software is "event-action" design
- This leads to some serious problems:
  - spaghetti code
  - consequences of new event-action
  - hardware dependency

5

## HORROCKS'S solution and the Empirical Modelling solution

- HORROCKS'S
- Empirical Modelling (EM)



\*state represented by *statecharts*

- the application of a UML concept in design

6

## Empirical Modelling Concepts

- 3 conceptual keys of EM
  - Observable - some feature of a system to which a value or status can be attributed in the system
  - Agent - a family of observables that is responsible for particular changes to observables
  - Dependency - a relationship between observables
- EM construes a situation via two complementary activities:
  - Describing the abstract explanatory account of the situation in the modeller's mind
  - Constructing an ISM to imitate the observed responses to experimental and exploratory interaction with a referent

7

## Interactive Situation Model (ISM)

- ISM concept - to represent the way in which the modeller construes a situation
- ISM represents the interactions between the agents in a reactive system
- ISM arises from exploiting computer technology to create artefacts that can be more conveniently and effectively modified and reinterpreted

8

## Example of ISM: Digital Watch

- Consists of three main figures:
  - Figure 1.1 - The significant features of the watch
  - Figure 1.2 - Reveals how the time displayed on the digital watch is to be interpreted
  - Figure 1.3 - Captures the expectations of the user about the states and transitions of the watch
- Some potential action the modeller can perform:
  - simulate standard interaction with the watch
  - observe the way in which the states of the three components are consistently transformed.

9

## Summary of the paper and conclusion

- Static statechart documenting UI
- Dynamic statechart with automatic UI code generation
- ISM

Horrocks's current practice

Horrocks's aspiration

EM approach

10

## Features of EM approach

- Conceptual grasp on the world of event-actions
- Scope for integration of animated statechart and simulation
- Closer integration between UI and the underlying model
- Flexible re-design and fault-tolerance

11

# Any Questions?

## Related references

- EM web site:  
<http://www.dcs.warwick.ac.uk/modelling/>
- I Horrocks's book: *Constructing the User Interface with Statecharts*
- E-mail's addresses
  - Meurig Beynon: [wmb@dcs.warwick.ac.uk](mailto:wmb@dcs.warwick.ac.uk)
  - Pi-Hwa Sun: [sun@dcs.warwick.ac.uk](mailto:sun@dcs.warwick.ac.uk)
  - Ashley Ward: [ashley@dcs.warwick.ac.uk](mailto:ashley@dcs.warwick.ac.uk)

