Extreme Architecture
Amplifying the UML

Phil Robinson
Lonsdale Systems

Unified Modelling Language (UML)

The UML is a notation not a methodology
## History of the UML

<table>
<thead>
<tr>
<th>Year</th>
<th>Version</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1995</td>
<td>Unified Method 0.8 (Booch &amp; Rumbaugh)</td>
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<tr>
<td>1996</td>
<td>Unified Modelling Language (UML) 0.9 (Jacobson joins and they become the <em>Three Amigos</em>)</td>
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<td>1997</td>
<td>(Jan) - UML 1.0</td>
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<td></td>
<td>(Sep) - UML1.1 (adopted by OMG)</td>
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<tr>
<td>1998</td>
<td>UML 1.2</td>
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<tr>
<td>1999</td>
<td>UML 1.3 (first formal version)</td>
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<tr>
<td>2001</td>
<td>UML 1.4</td>
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<tr>
<td>2002</td>
<td>UML 1.4.1</td>
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<tr>
<td>2003</td>
<td>(Mar) - UML 1.5</td>
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<tr>
<td></td>
<td>(Aug) - UML 2.0</td>
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<tr>
<td>????</td>
<td>ISO Standard (based on UML 1.4.1!)</td>
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## What is the UML used for?

The Unified Modeling Language is a visual language for specifying, constructing and documenting the artifacts of systems.

*OMG UML 2.0 Superstructure Specification*
Which systems?

Industry Sector
Enterprise
Business Process
Application
Component

Human Activity Systems
Software Systems

System views

Structure diagrams show the static structure of the objects in a system

OMG UML 2.0 Superstructure Specification
Behavior diagrams show the dynamic behavior of the objects in a system...

OMG UML 2.0 Superstructure Specification
• The taxonomy of UML diagrams is based on abstract system views.
• This has two disadvantages:
  - Diagrams tend to be drawn because they are “in the UML and therefore must be required”
  - There is an assumption that these are the only types of diagram that can be drawn.
This taxonomy provides a logical organization for the various major kinds of diagrams. However, it does not preclude the mixing different kinds of diagram types...

..the boundaries between the various kinds of diagram types are not strictly enforced...

OMG UML 2.0 Superstructure Specification
The Extreme Architecture framework

<table>
<thead>
<tr>
<th>Activity</th>
<th>Information</th>
<th>Software</th>
<th>Data</th>
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<tbody>
<tr>
<td>Sector</td>
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**Architecture Content**

Why extreme?

- Pragmatic – adopts a ‘middle path’ between the extremes of chaos and perfection
- Easy to describe – single 6 x 6 matrix
- Minimal work products – simple bullet point lists will do!
- Unifies disparate disciplines
  - Business modelling
  - Requirements analysis
  - Software construction
  - IT infrastructure management
- Encourages a shared understanding
### Requirements analysis

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<td>Subject Areas</td>
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<td>Business Objects</td>
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<td>Activities</td>
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<tr>
<td>Application</td>
<td>Use Cases</td>
<td>Interface Requirements</td>
<td>Vision Functional Requirements</td>
<td>Storage Requirements</td>
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<td>Component</td>
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### Software construction

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<td>Component</td>
<td>User Interface</td>
<td>Architecture Code Test Cases</td>
<td>Schemas</td>
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### Infrastructure management

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<td>Enterprise</td>
<td>Activities Workflow</td>
<td>Interface Requirements</td>
<td>Vision</td>
<td>Functional Requirements Non-Functional Requirements</td>
</tr>
<tr>
<td>Process</td>
<td>Use Cases</td>
<td>Interface Requirements</td>
<td>Storage Requirements</td>
<td>Platforms Networks</td>
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<td>Architecture</td>
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<td>Component</td>
<td></td>
<td>Schemas</td>
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</tbody>
</table>

- **Activity**: Scope, Activities, Workflow
- **Information**: Subject Areas Information Requirements, Interface Requirements
- **Software**: Functional Areas, Vision, Non-Functional Requirements
- **Data**: Business Objects, Storage Requirements
- **Technology**: Platforms, Networks

### Use Cases

- **Scope**: Activity
- **Activities**: Infrastructure
- **Workflow**: Use Cases

### Subject Areas

- **Information**: Software, Data, Technology
- **Software**: Architecture, Code, Test Cases
- **Data**: Schemas
Subject Areas

Information Requirements

Activity
Information
Software
Data
Technology

Design
Enterprise
Process
Application
Component

Environment
Enterprise
Process
Application
Component

«subject area» Food and Beverage
«subject area» House Keeping
«database» Accommodation
«information requirement» Cleaning Request
«information requirement» Laundry List
«information requirement» Room Service Order
«information requirement» Minbar Contents

Package Diagram

- «subject area» Housekeeping
- «information requirement» Cleaning Request
- «information requirement» Laundry List
- «information requirement» Room Service Order
- «information requirement» Minbar Contents

- «database» Accommodation
- «subject area» House Keeping
- «subject area» Food and Beverage
- «database» Accommodation
- «database» Room Service
- «database» Laundry
- «information requirement» Cleaning Request
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- «information requirement» Minbar Contents
- **functional requirement**
  The application shall debit the guest's account a single night's accommodation charge each day.

- **functional requirement**
  The application shall debit the accommodation charge at 12 am each night.

- **functional requirement**
  The application shall use the standard room rate and apply customer discounts in order to calculate the accommodation charge.

- **functional requirement**
  The application will add GST to the accommodation charge using the standard GST rate.
The application shall be capable of being fully recovered within fifteen minutes.

The application shall provide a full audit trail of all database updates.

The application shall authenticate all users attempting to log on.

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The application shall authenticate all users attempting to log on.
www.extremearchitecture.org

Scope
Activities
Workflow
Subject Areas
Information
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Vision
Functional Requirements
Non-Functional Requirements
Storage Requirements
User Interface
Architecture
Code
Test Cases
Schemas
Platforms
Networks
Activity
Information
Software
Data
Technology
Sector
Enterprise
Process
Application
Component
Client
Application
Web Server
Application Server

Deployment Diagram

Platforms
Networks
Remember minimal work products

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<tbody>
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<td>▪ Promotion of new releases</td>
<td>▪ New release details</td>
<td>▪ General ledger</td>
<td>▪ Intel server</td>
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<tr>
<td></td>
<td>▪ Membership</td>
<td>▪ Member details</td>
<td>▪ Accounts receivable</td>
<td>▪ ADSL internet connection</td>
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<td>▪ Video library</td>
<td>▪ Video details</td>
<td>▪ Asset register</td>
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<td>▪ Casual staff payroll</td>
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<td>▪ Rentals</td>
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<td>▪ Rental management</td>
<td>▪ MySQL</td>
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<td>• Returns</td>
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<td>▪ Normal Return</td>
<td>▪ Date out</td>
<td>▪ Video title</td>
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<td>▪ Due back</td>
<td>▪ Video copy</td>
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<td>▪ Follow up</td>
<td>▪ Actual return date</td>
<td>▪ Rental</td>
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<td></td>
<td>▪ overdue videos</td>
<td>▪ Fine due</td>
<td>▪ Actual date</td>
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<tr>
<td>Process</td>
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<td>▪ Notify overdue loans</td>
<td>▪ Fine paid</td>
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<td>• Member details</td>
<td>▪ Calculate fine due</td>
<td>• Fine paid</td>
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<td>• Video title</td>
<td>▪ Read video</td>
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<td>▪ membership</td>
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<td></td>
<td>• Rental</td>
<td>▪ card bar codes</td>
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<td>Application</td>
<td>• Return screen</td>
<td>▪ Notify overdue loans</td>
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<td>• Record return</td>
<td>▪ Calculate fine due</td>
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<td>• Record fine paid</td>
<td>▪ Read video</td>
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<td>• Date out</td>
<td>▪ membership</td>
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<td>▪ card bar codes</td>
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<td>• Return screen</td>
<td>▪ Calculate fine due</td>
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<td>• Fine window</td>
<td>▪ Read video</td>
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<td>• Overdue report</td>
<td>▪ membership</td>
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<td>▪ card bar codes</td>
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These are the deliverables of the software project that builds the application!

Questions

Phil Robinson
Lonsdale Systems