Early Aspects

Mark Dalgarno
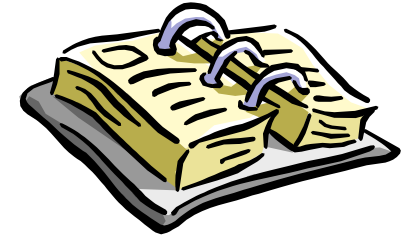
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What are (Early) Aspects?

❑ Some Terminology
  - Concerns
    ▪ Areas of interest or focus in a system
      ○ E.g. Maintainability, Variability in a Product Line
  - Aspects
    ▪ Concerns that *crosscut* the *dominant decomposition*

❑ Early Aspects
  - *Identify*, *encapsulate* and *manipulate* aspects early in the lifecycle
    ▪ Aspect Oriented Requirements Engineering
    ▪ Aspect Oriented Architecture Definition
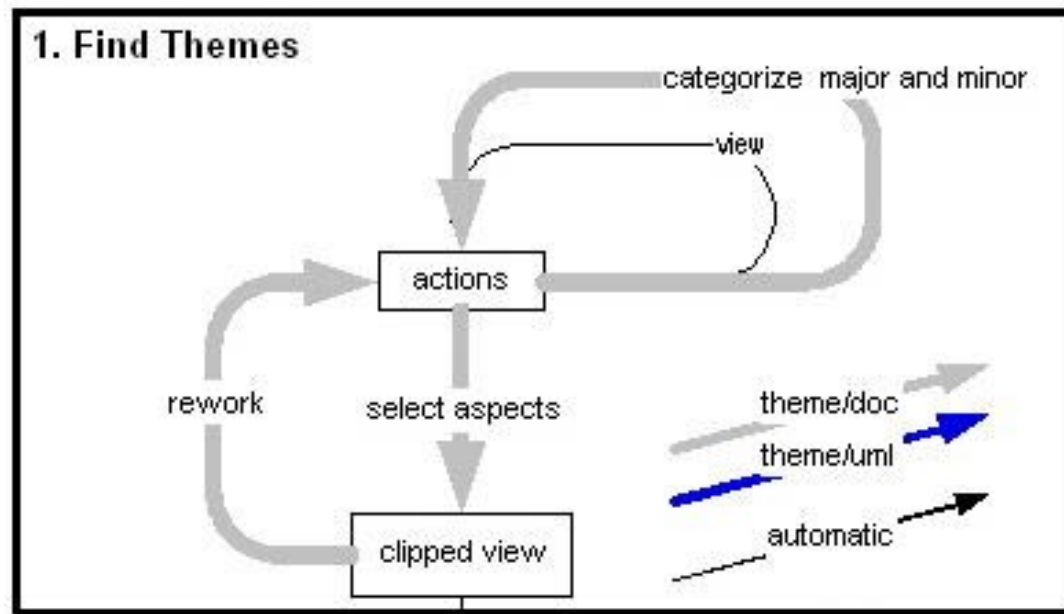   ▪ Aspect Oriented Design

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❑ **Identifying**, **encapsulating** and **manipulating** aspects earlier in the lifecycle will yield benefits:

– Improved understanding of the system

– Improved trade-off analysis

– Improved traceability and mapping

– Better support for Aspect Oriented Programming

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Aspect Oriented Requirements Engineering

❑ THEME / DOC
   – Helps identify aspects in requirements.


   – Feeds resulting aspects into THEME/UML design tool

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Aspect Oriented Architecture

❑ **A**spectual **S**oftware **A**rchitecture **A**nalysis **M**ethod (ASAAM)

- – Architectural evaluation method
- – Complements SAAM with aspectual scenarios
- – Identifies architectural aspects
- – Guides architectural refactoring to support aspects
- – But not yet applied industrially

Aspect Oriented Design

❑ **A**spectual **M**ixin **L**ayers (AMLs)

- Based on AHEAD – stacks of basic features composed to form programs

- Mixin Layers implement or refine features

- **Aspectual Mixin Layers** – Mixin layers implementing or refining Aspects
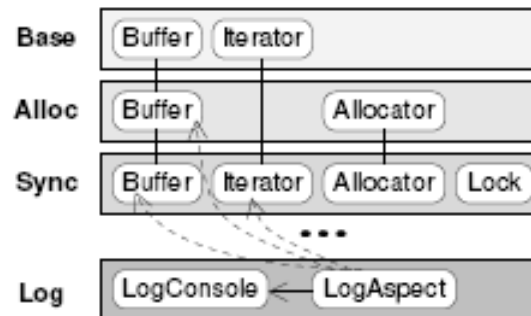
- Supported in FeatureC++

Hot or not?

- ❑ An increasing body of research but limited industrial application exists
- ❑ Some (free) tools available for experimentation
- ❑ Lack of momentum on some projects
  - − Eclipse CME project now mothballed
- ❑ Shows promise in some areas but not yet mature enough to assess claim

Where to find out more

- ❑ Aspect-Oriented Software Development:
  - – http://www.aosd.net/
- ❑ Early Aspects:
  - – http://www.early-aspects.net/
- ❑ THEME
  - – http://www.dsg.cs.tcd.ie/index.php?category_id=363
- ❑ ASAAM
  - – http://trese.cs.utwente.nl/taosad/index.htm
- ❑ Aspectual Mixin Layers & Feature C++
  - – http://wwwiti.cs.uni-magdeburg.de/iti_db/forschung/fop/fea