



***Historical Awareness Support and Its  
Evaluation in Collaborative Software  
Engineering***

***Workshop on Evaluation of Collaborative  
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Awareness of others' activities is required in collaborative software engineering environments:

- to coordinate work
- to prevent conflict
- to identify potential problems (e.g duplication, time consuming tasks)

One popular definition of awareness:

“An understanding of the activities of others which provides a context for your own activity”. [Dourish1992]

We have developed a software artefact management system (OSCAR) under the auspices of the GENESIS project:

- Storage/retrieval of software artefacts described using XML
- Abstract services for version control and metadata storage
- Concrete service implementation using CVS and relational databases respectively
- Minimally invasive
- File based artefacts

We intend to add awareness support to OSCAR and evaluate the effects on the software development process.

Two major forms of awareness exist:

**Asynchronous** Delivery of information, no timing constraint

**Synchronous** Timely information delivery

In the context of OSCAR, *asynchronous* awareness may be implemented; *synchronous* awareness is more difficult.

# *Awareness types*

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Several subtypes of asynchronous awareness have been defined [Drury2002]

**Informal** The general sense of who is around and what others are up to

**Peripheral** Where people know what others are doing

**Social** Presence and activity information about shared-environment users

**Group structural** Knowledge of roles, responsibilities, opinions and process information

**Workspace** Who is working on what

Many shared environments have awareness support of various kinds already:

**Interlocus** “Workspace awareness without workspaces”

Based on user file snapshots [Nomura98]

**SPE/JViews** Inconsistency management environment.

Awareness to help resolve problems [Grundy98]

**Shared Editors** Awareness to prevent conflict, dynamic role assignment [Dourish92, Campbell102]

**“Wear”** A collection of historical information for single artefacts [Hill193]

# *Historical Awareness*

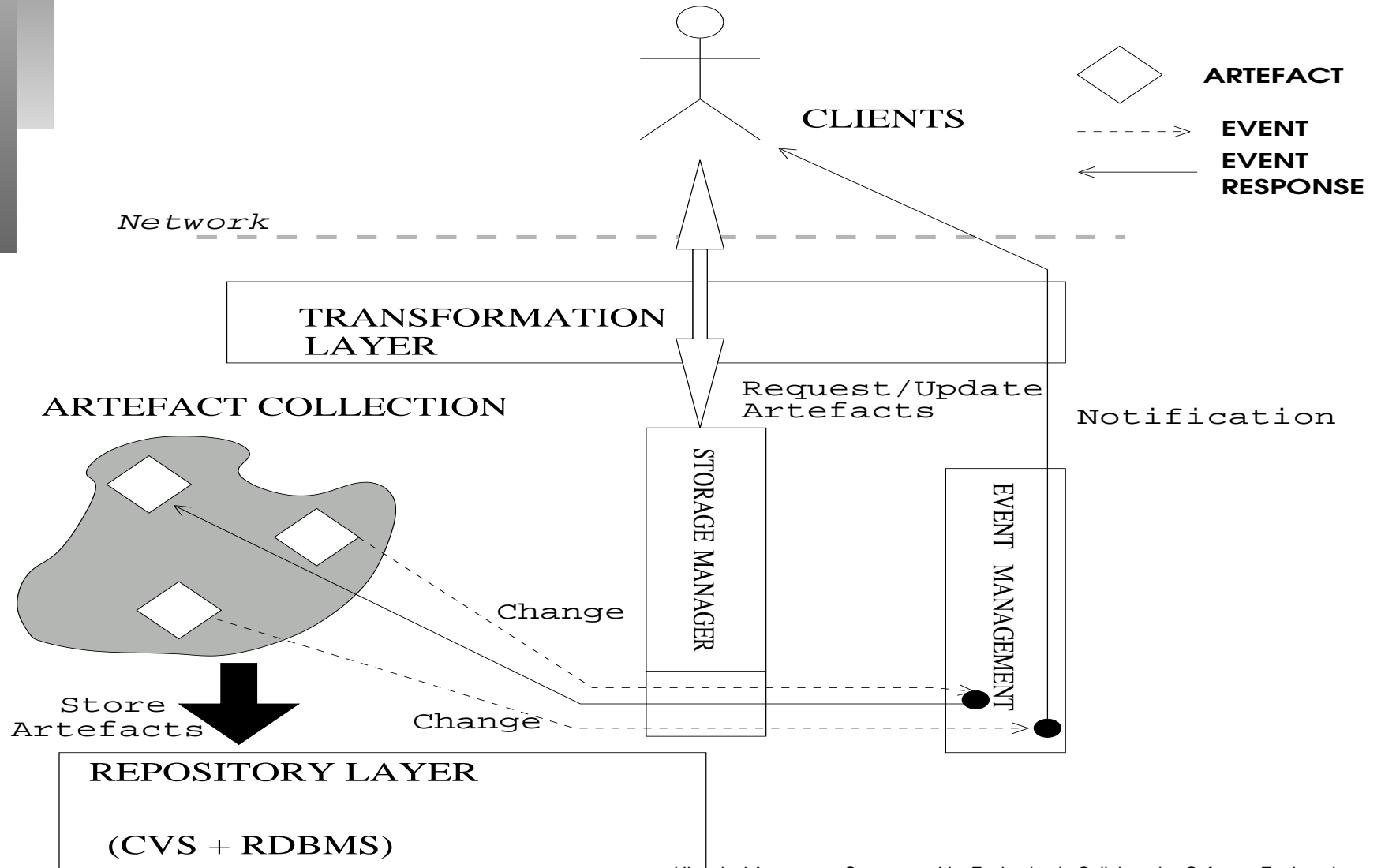
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*Historical activity presented to the user regarding the changes over time of a collection of heterogenous artefacts*

This is distinct from changelogs/history views:

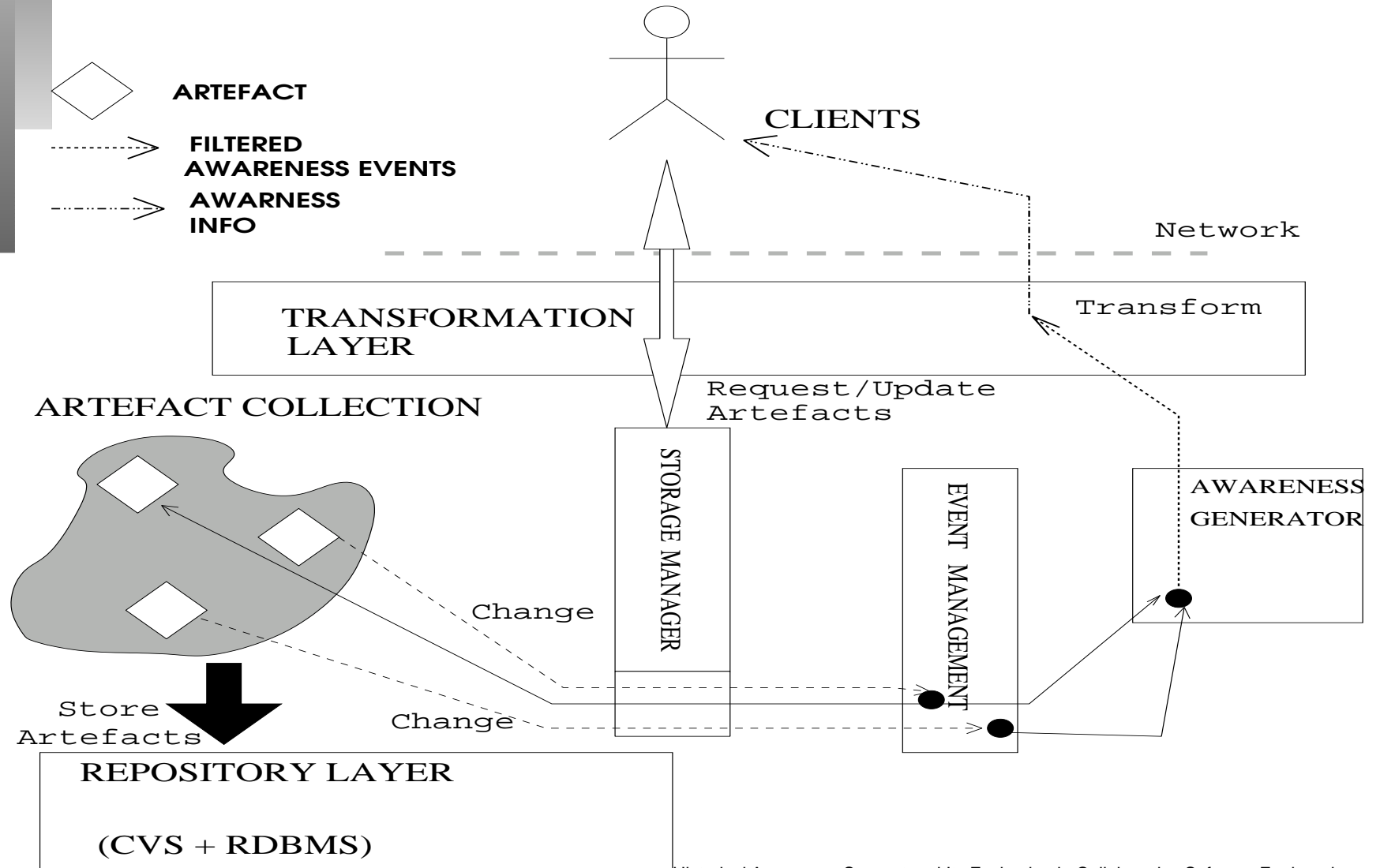
- Provides information not explicitly requested by the user
- Describes a collection rather than a single file
- Shows context rather than a contextless, narrow history

# Architecture (1)

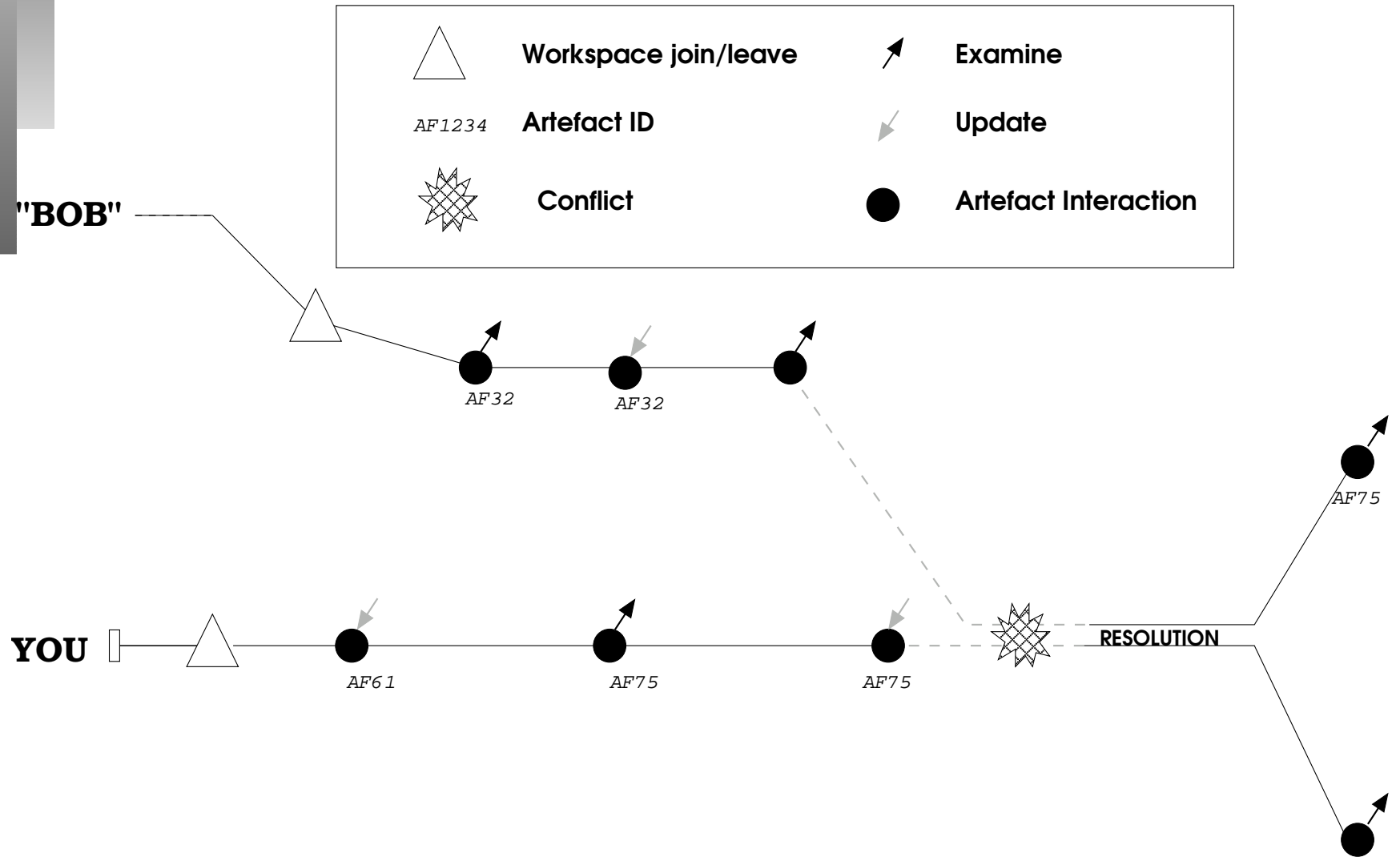




# Architecture (2)



# Timeline



Once awareness support is implemented, a preliminary experiment will be conducted:

1. Create a standard collection of artefacts
2. Devise a simple problem that must be solved which requires these artefacts and collaboration (the hard part!)
3. Give these problems to two groups of users, one using awareness and one without
4. Compare the quality of solutions produced by each group

Suggestions for expanding this experiment later on?

Once suitable subjects have been found, the following data will be analysed:

- Use of simple automatic metrics (using GEM) to measure code quality attributes
- Inspection to yield a qualitative judgement of solution quality
- Comparison of the number and types of artefacts created by the teams

A potential second step is to ask the GENESIS project industrial partners to evaluate the utility of the awareness extensions for their own work.

Aside from making the architectural changes outlined further work includes:

- Refining the concept of *historical awareness*
- Selection and implementation of a distribution approach, including filtering, possibly using Self Organising Map applied to a peer-to-peer network.
- Dealing with direct repository access outside of OSCAR (deus ex machina)
- Derivation of task awareness information from the workflow engine

# Questions?

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If you have any questions later, please feel free to contact us:

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