

# *amire*

*workshop*

**IST/E3 Concertation Meeting - Brussels 27th May 2002**



# Welcome

- ❑ Thanks to all people participating in the workshop.
- ❑ Specially to those companies accepting the invitation of presenting their projects
- ❑ Expect to be a productive meeting
- ❑ Finally, thanks to EC (E.Badique) for offering hosting the workshop during this concertation meeting

# Workshop Agenda (I)

- Presentation of the AMIRE project
- Presentation of IST MR Projects

# Workshop Agenda (II)

## AMIRE PROJECT Session

- |               |   |
|---------------|---|
| 10:30 - 10:40 | Workshop Objectives (LABEIN)  |
| 10:40 – 10:50 | AMIRE project overview (LABEIN)   |
| 10:50 - 11:05 | AMIRE Gems (SBS C-LAB)  |
| 11:05 – 11:20 | AMIRE Components (LABEIN)   |
| 11:20 – 11:35 | AMIRE Framework (FHH)   |
| 11:35 – 11:50 | Authoring Process (FHG/AGC)   |
| 11:50 – 12:00 | Possible schemes of collaboration with other IST or external projects (AMIRE) |

# Workshop Agenda (III)

## Presentation of IST MR Projects

- |               |  |
|---------------|--|
| 13:00 – 13:40 | Art. Live Project (Université Catholique de Louvain) |
| 13:40 – 14:00 | AR-PDA (SBS C-LAB)                                   |
| 14:00 – 14:15 | STAR (MIRALAB)                                       |
| 14:15 – 14:30 | LIFEPLUS (MIRALAB)                                   |
| 14:30 – 14:45 | Coffee Break   |
| 14:45 – 15:15 | MEGA (DIST – University of Genova)                   |
| 15:15 – 15:30 | ARCHEOGUIDE (INTRACOM)                               |
| 15:30 – 15:45 | INTERFACE (DIST – University of Genova)              |
| 15:45         | Conclusions & End of AMIRE Workshop                  |

# Workshop Objectives

- ❑ Collect *lessons learned* and *requirements* from other IST projects
- ❑ Analyze development and authoring processes on current MR demonstrators/prototypes.
- ❑ Identify existing solutions to transform them into AMIRE Gems and Components
- ❑ Discuss possible schemes of future collaboration (FP6 Instruments, etc.)

# Motivation

- ❑ Little production/authoring process conceptualization
- ❑ Monolithic block architectures
- ❑ Poor re-use capabilities
- ❑ Long 'time to market'
- ❑ Current VR authoring methods are difficult and not intuitive
- ❑ Development restricted to experts, switch from MR expert programmer to designers / end users is important

# How can we improve the MR production process?

- ❑ Better conceptualization of the production process for MR applications
- ❑ Facilitation of MR authoring
  - ✓ More flexible and structured authoring environments
  - ✓ Conception of authoring methodologies and metaphors
- ❑ Provision of MR development capabilities to non-experts, transfer into different application domains
- ❑ More efficient production process

# AMIRE Project Overview

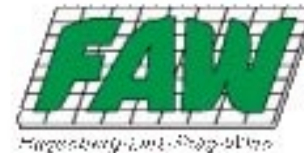
# AMIRE Project

- ❑ AMIRE (Authoring Mixed Reality)
- ❑ Recently launched IST project → IST-2001-34024
- ❑ A Component and Framework-Based Approach
- ❑ Project Dev. Time ⇔ 27 months (April 02 – June 04)

# Partners



Fraunhofer  
Anwendungszentrum  
Computergraphik in  
Chemie und Pharmazie



Guggenheim BILBAO

Offen für mehr  
Verantwortung.

# AMIRE Objectives

- ❑ Efficiently facilitate the creation and modification of mixed reality applications
  - ✓ More widespread use
  - ✓ Transfer of MR into different application domains
  - ✓ Exploiting synergies between different MR methodologies
  - ✓ Authoring as new application domain
- ❑ Two demonstrators:
  - ✓ Training application for OMV (oil refinery)
  - ✓ Museum application (Museum of Bilbao)
- ❑ Trigger and contribute to standardization

# Key Problems in MR design and development

PROBLEM	STATE OF THE ART	AMIRE INNOVATION
MR applications can be only extended with much overhead	Many MR applications are “hardcoded” and restricted in use	A flexible, easy to use framework that can easily be extended and reused in other applications domains
MR applications are often programmed “right away”	No design approach for structured development of MR content	Dedicated design approach and methodology for MR application development
Development of MR applications is very time consuming	No reuse and adaption based on component-based approaches exists in MR	High level components abstract the MR complexity and help the end users to develop their own MR applications

# Key Problems in MR design and development

PROBLEM	STATE OF THE ART	AMIRE INNOVATION
Efficiently third-party solutions can hardly be reused in new projects	Many projects build their own MR tools with no standard and no sharing them to other people	With AMIRE GEMS will be provided with reusable solutions and a technique to integrate them in new applications
Development of MR is currently restricted to experts	MR applications are programmed and not supported by visual tools	AMIRE will support visual authoring tools for MR applications
Very few MR applications are in commercial use	Existing MR applications are often “toy” applications proving new concepts but not commercial exploitation	Two different demonstrators (museum and oil refinery) show the economic potential of AMIRE

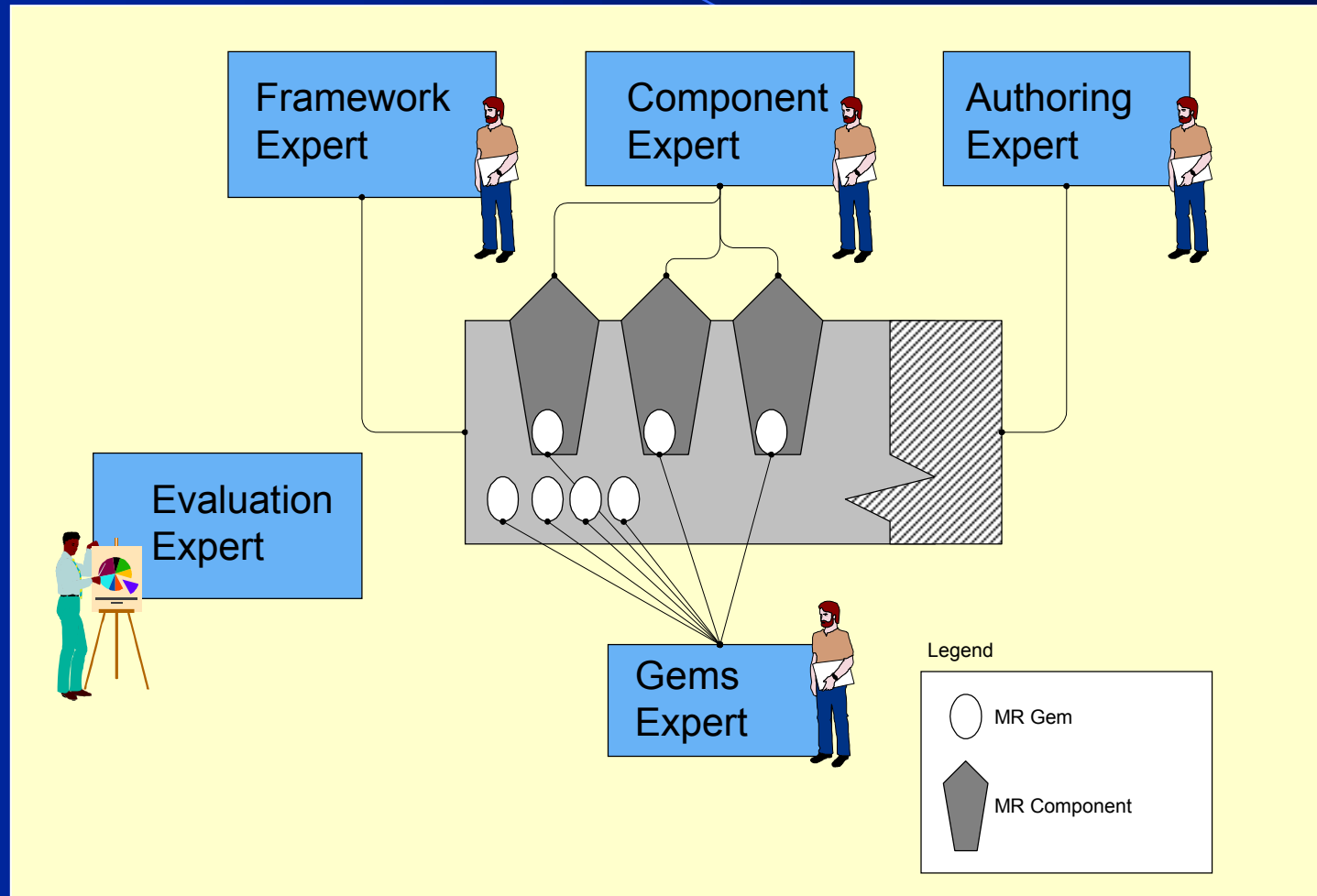
# Expected Results

- ❑ Production process for developing and modifying MR content
- ❑ AMIRE framework containing libraries of Gems and Components
- ❑ AMIRE authoring tools to edit MR content.
- ❑ Best practice example for using MR in applications. Two demonstrators
- ❑ Evaluation reports (framework, authoring tools, demonstrators)

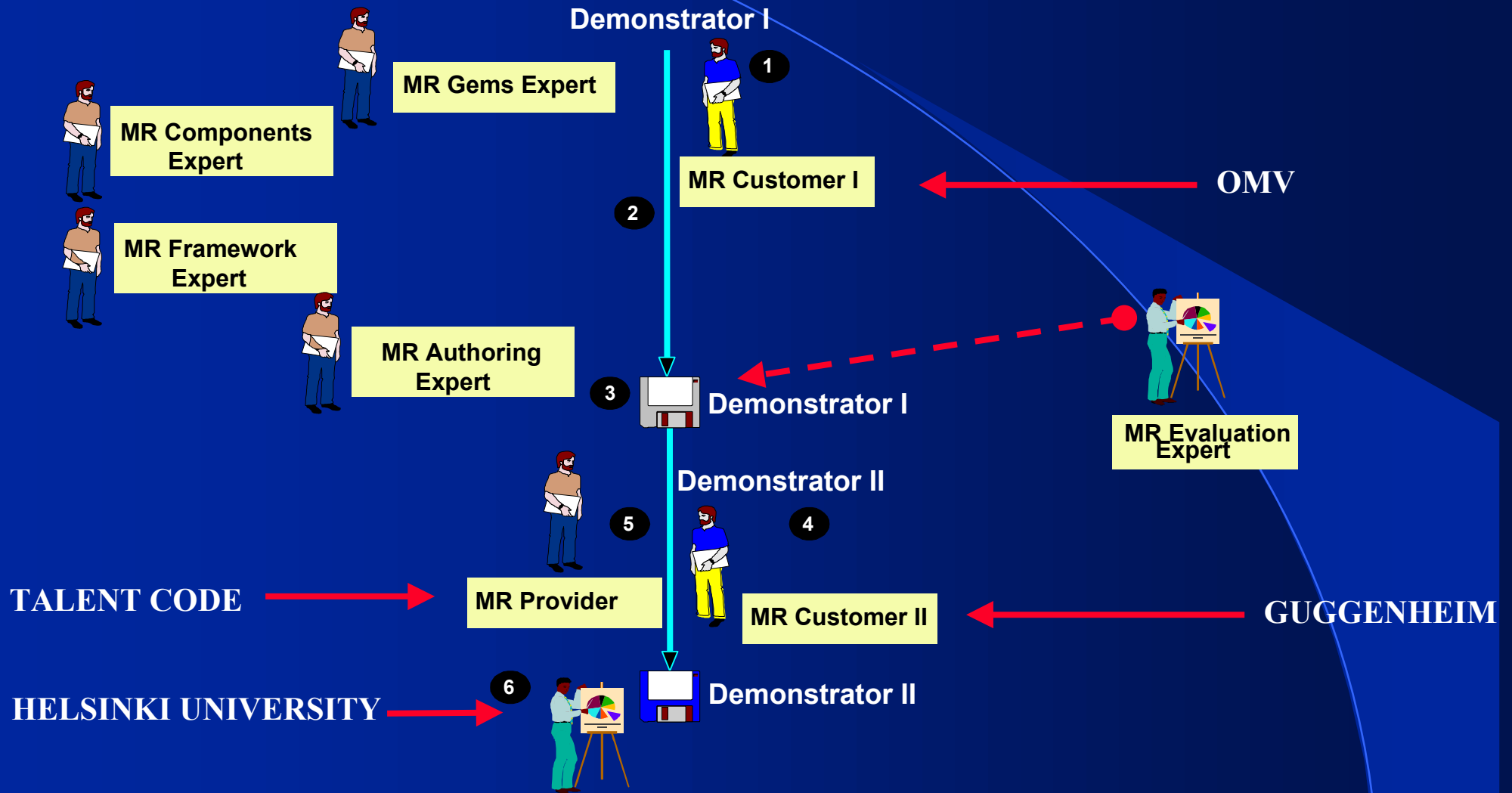
# Workpackages

Task	WP	Workpackage Name
Management	WP1	Management
Specification	WP2	Production Process
Technology	WP3	MR Gems Dev.
	WP4	MR Components Dev.
	WP5	MR Framework Dev.
	WP6	MR Authoring Dev.
Demonstrators	WP7	Demonstrators Dev.
Evaluation	WP8	Evaluation
Exploitation	WP9	Exploitation and Diss.

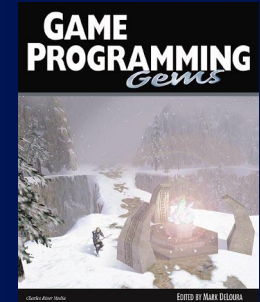
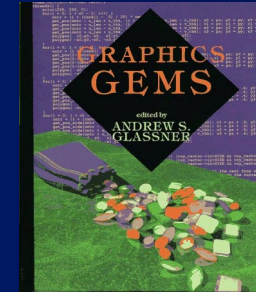
# The different MR experts...



# Workflow AMIRE Project



# AMIRE Gems



## □ Problem:

✓ Efficient 3<sup>rd</sup> party solutions for common tasks in MR applications are difficult to find and reuse.

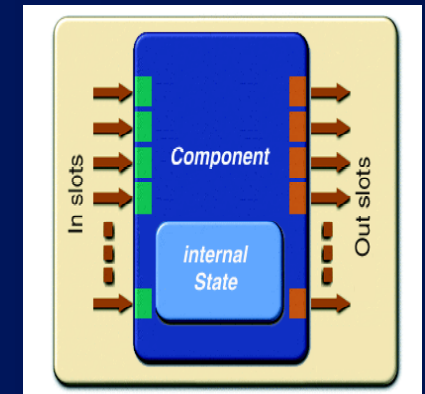
## □ State of the Art:

✓ Many projects build their own MR algorithms and techniques – there are no established standards and sharing/reuse is not supported as a primary goal.

## □ Approach:

✓ Collect established solutions to individual tasks into a library of MR GEMs.( e.g. object recognition, tracking, camera control).

# AMIRE Components

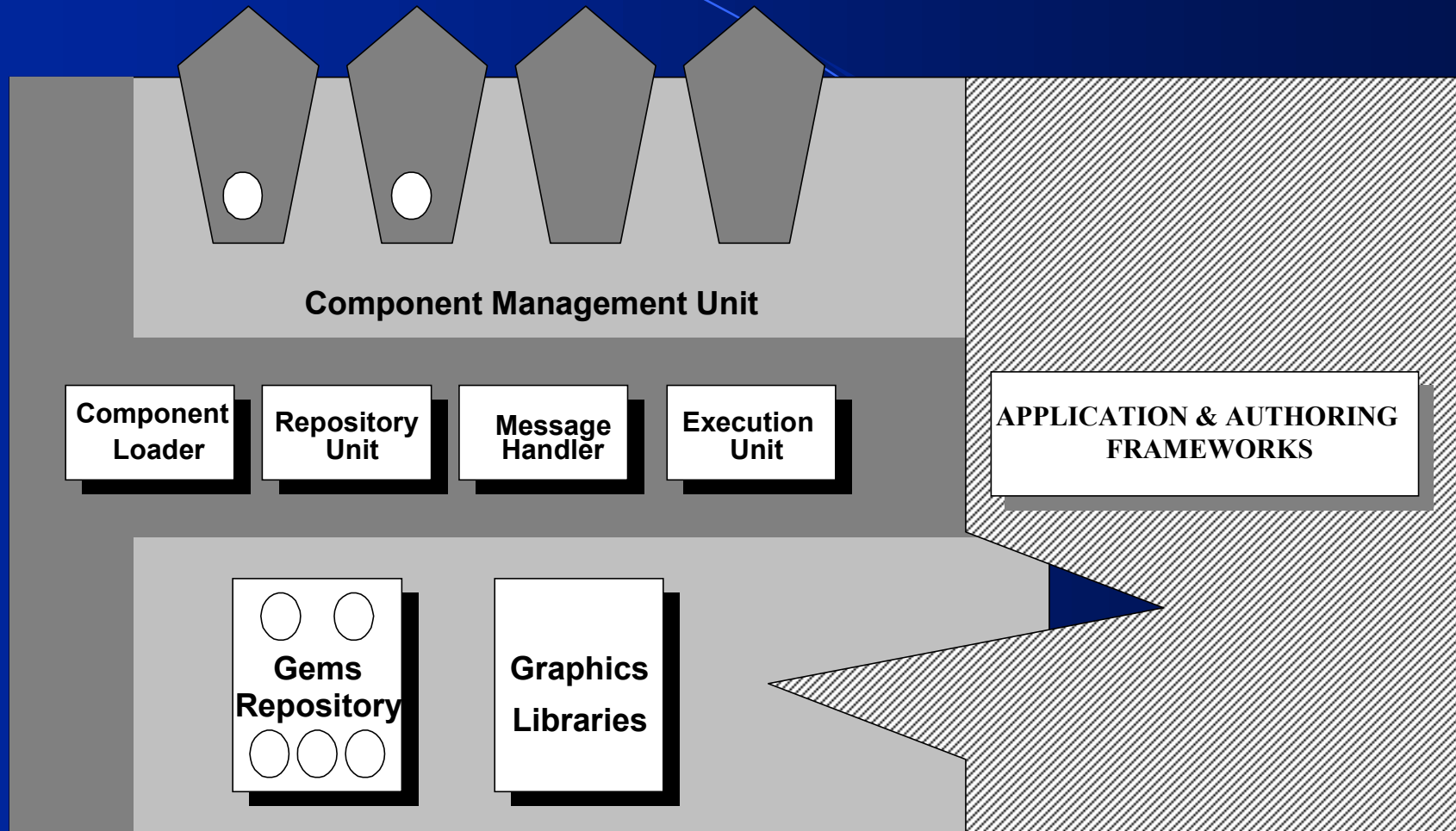


- ❑ Used to model content building blocks
- ❑ Stored in component library
- ❑ High-level and domain-specific
- ❑ Consist of geometry model and behavior
- ❑ Re-usable, customizable and adaptable
- ❑ Cost effective application development

# AMIRE Framework

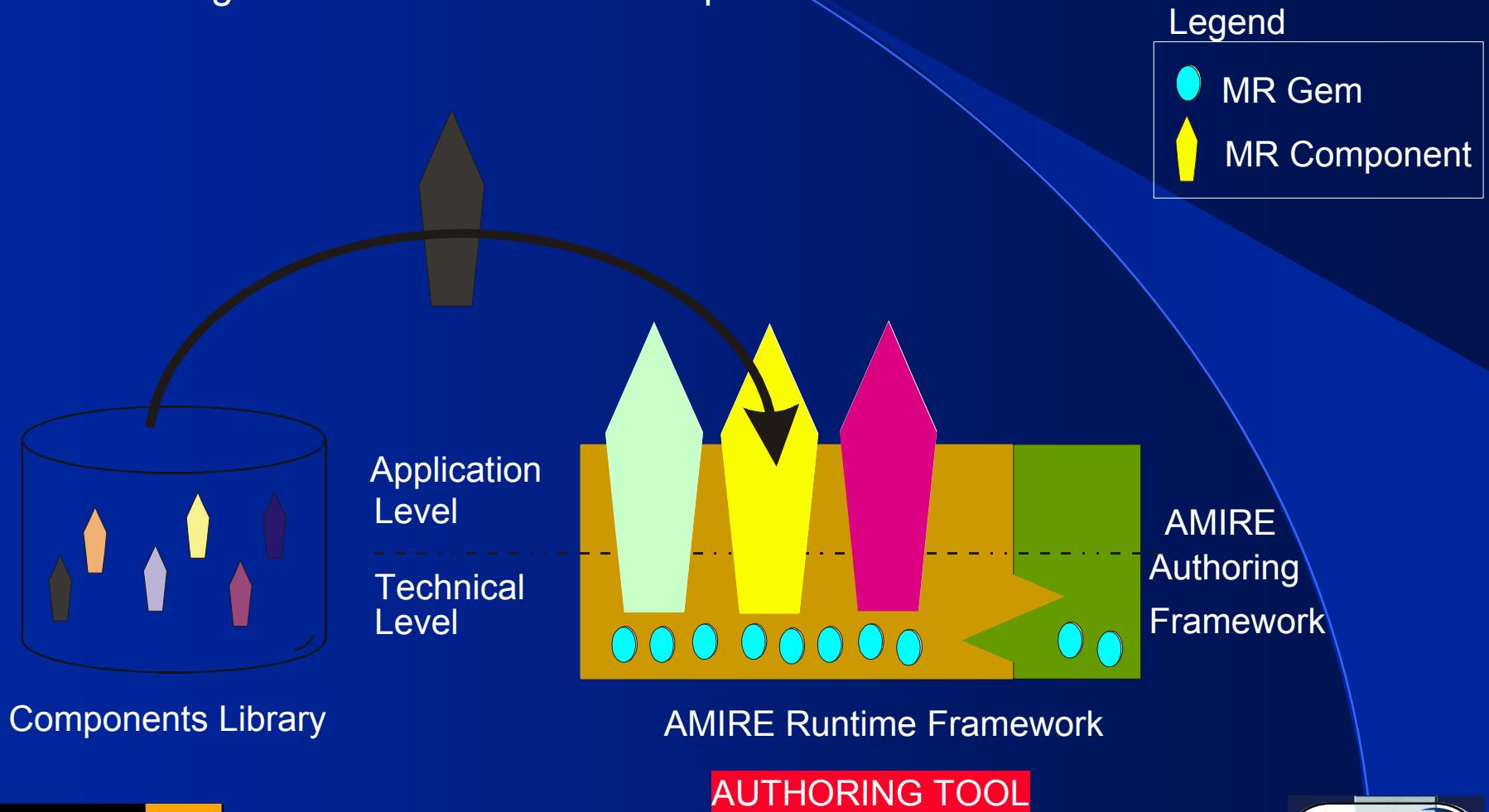
- ❑ Framework as glue between gems and components
- ❑ Framework offers a High Level API and an Interface for the components
  - ✓ MR Runtime Framework
  - ✓ Authoring Framework
  - ✓ Application Framework

# AMIRE Framework



# Production Process

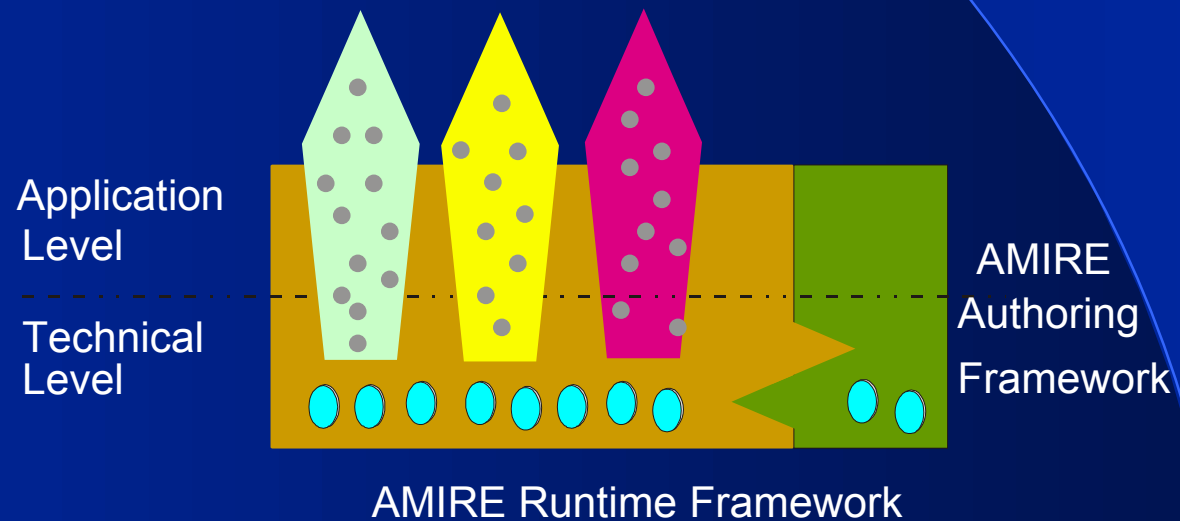
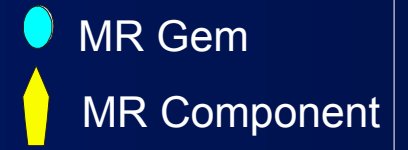
Step 1: The Authoring Tool is filled with MR Components



# Production Process

## Step 2: Components Customization

Legend



AMIRE Runtime Framework

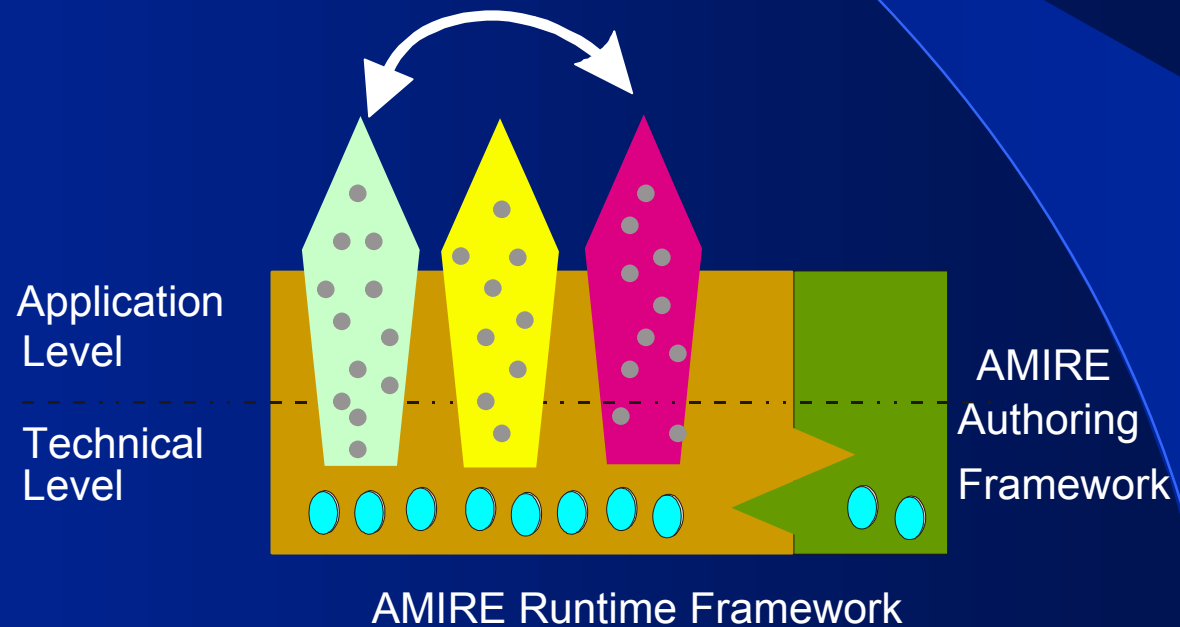
**AUTHORING TOOL**

# Production Process

## Step 3: Components Connection

Legend

- MR Gem
- MR Component



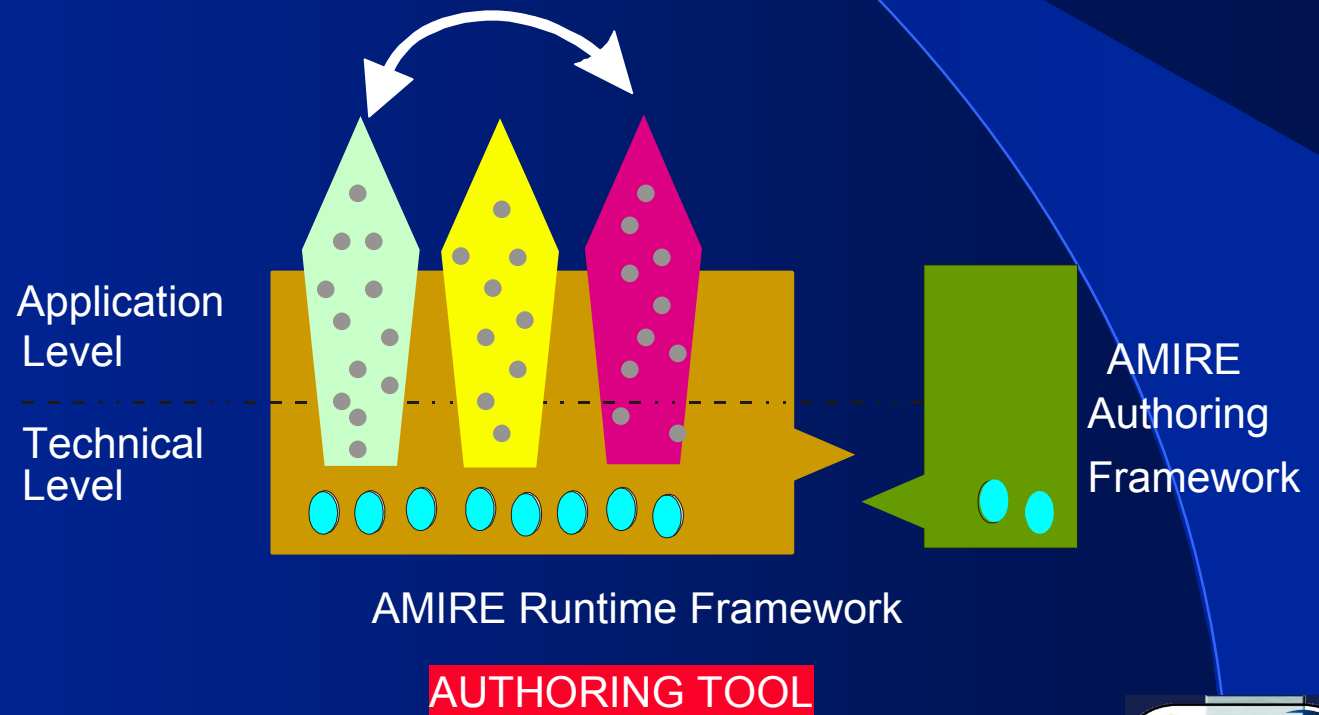
**AUTHORING TOOL**

# Production Process

Step 4: Authoring is completed and framework is being removed

Legend

- MR Gem
- MR Component

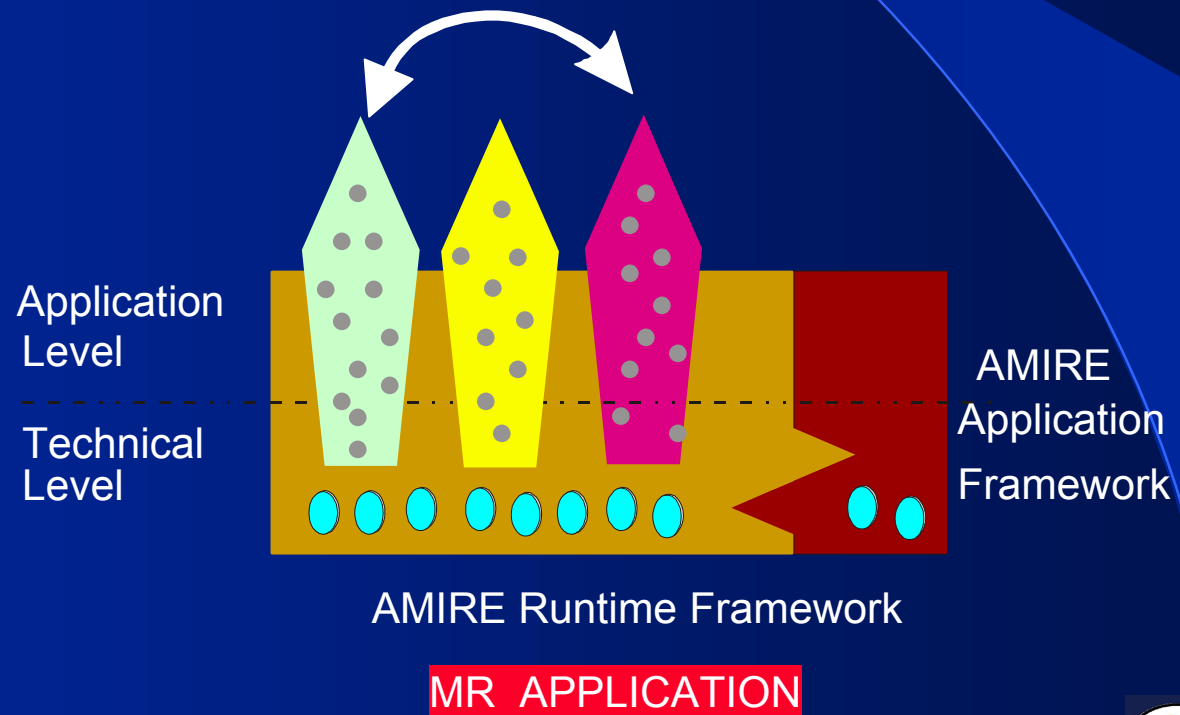


# Production Process

Step 5: Application is integrated and MR application is finished

Legend

- MR Gem
- MR Component

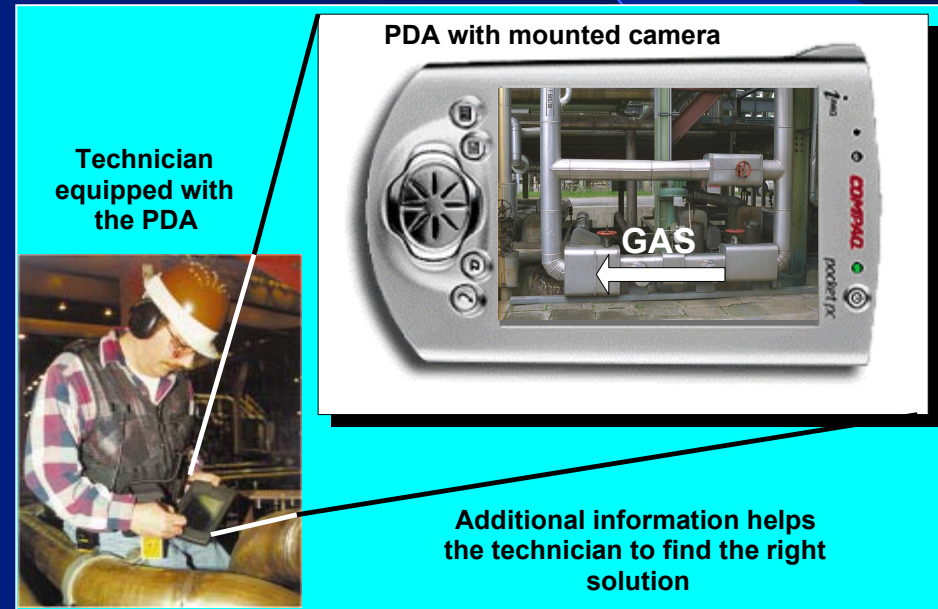
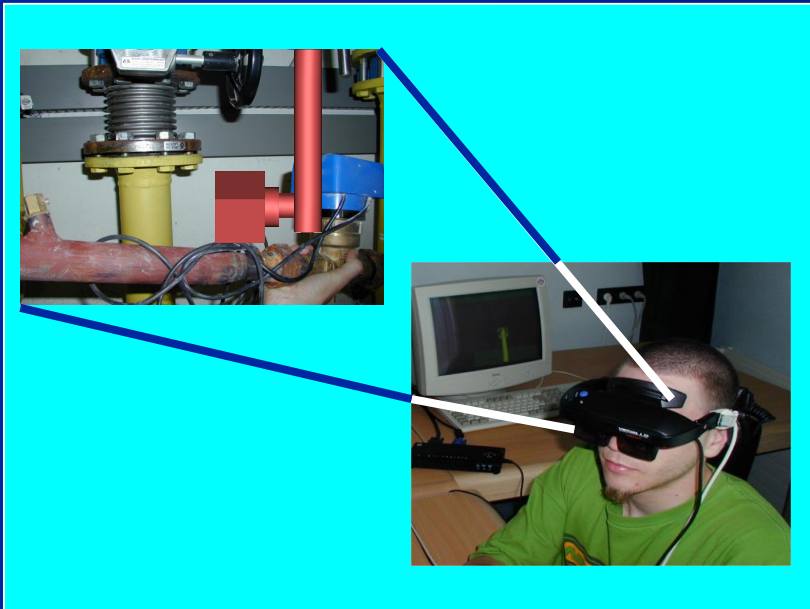


# Oil Refinery Demonstrator

## Oil Refinery Application

### ✓ Maintenance and service on power plant

- Indoor solution (Tracking system, iGlasses)
- Outdoor solution. Walkthrough to explore the refinery (Handheld/Tablet PC)



# Guggenheim Museum Demonstrator

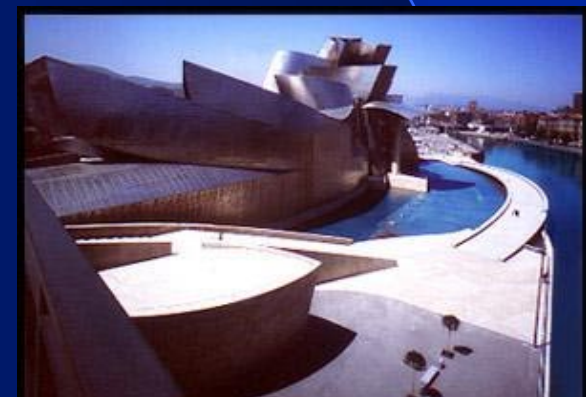
## □ Museum Application

### ✓ Museum Navigation System:

- Establishing a personalized visiting path
- Show real pieces augmented by virtual objects with hyper-links for accessing detailed information

### ✓ Personalized Virtual Museum Assistant:

- The virtual character provides personalized assistance and information about masterpieces



# AMIRE Questionnaires

- AMIRE Questionnaires ([www.amire.net/news](http://www.amire.net/news) & events ). MR Market Analysis deliverable
  - ✓ Trends and facts about the application of MR
  - ✓ Benefits of MR
  - ✓ Demands on the AMIRE toolkit
  - ✓ Target groups for the AMIRE toolkit
  
- Two different questionnaires:
  - ✓ Researcher/Content Developer
  - ✓ End User

# SIGGRAPH Campfire

- ❑ Interdisciplinary Workshop
- ❑ June 1-4, 2002 in Snowbird USA



Production Process of 3D Computer Graphics Applications-  
**CAMPFIRE** Structures, Roles and Tools  
ACM SIGGRAPH AND EUROGRAPHICS  
Snowbird, Utah



More information:

<http://www.agc.fhg.de/campfire/program.php>

# Project Web Site

[www.amire.net](http://www.amire.net)

Thank you