



## **WP 3: Tools & Platforms**

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## WP 3: Goals

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- Define and implement a toolbox for the different scenarios and the network to support
  - authoring,
  - visualisation,
  - collaboration (e.g., discussion supporting tools),
  - sharing of data,
  - modelling of activities of learning,
  - the employment of peripherals of common use (e.g., PDAs and webcams),
  - and the design of virtual artefacts in 3D environments as well as real artefacts with construction kits.



# WP 3: Process

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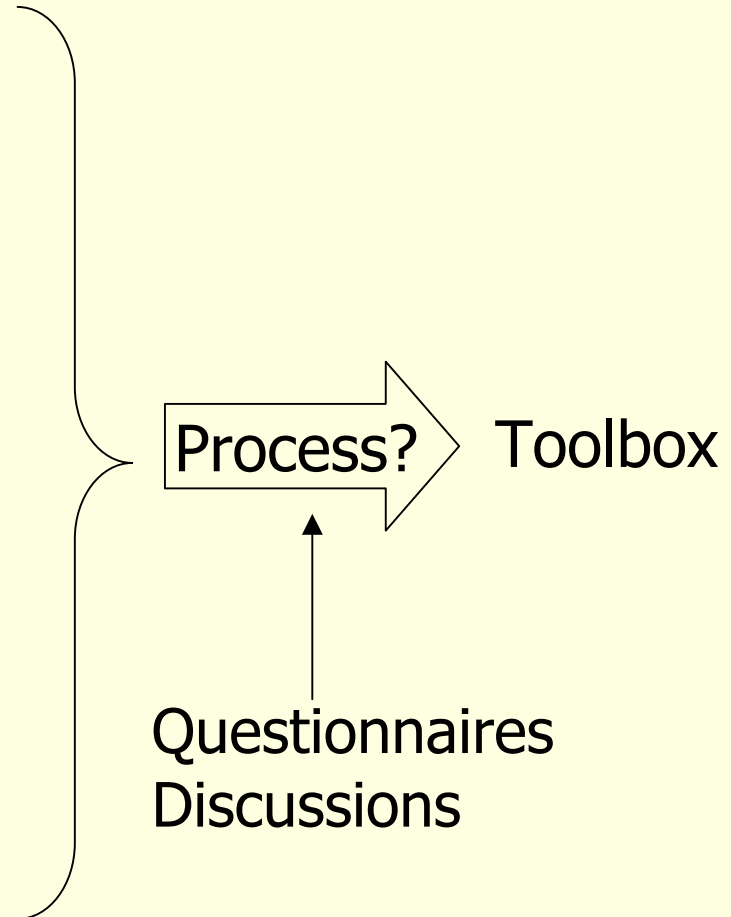
- Identify
  - what tools are needed,
  - what tools exist,
  - what tools can be adapted,
  - and what tools must be created from scratch.
- Agree on a common configuration with respect to both software and hardware.
- Design and evaluation of questionnaire.
- Results discussed at a workshop meeting.



# (Software-)Tools

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- **3rd party tools**
  - Apache, Linux, Java, VRML, etc
  - 3D Studio Max
  - Mindstorms, leJOS
- **Tools of project partners**
  - Active Documents (UNED)
  - CoolModes (UDUI)
  - Agent Framework (INESC)
- **3rd party Hardware**
  - RCX
  - Telescope
  - PDAs





Agreed upon **tools and platforms** based on results from the questionnaires and workshop discussions

## Server

PC/Server

Linux  
Apache  
Tomcat  
XML, XSLT  
Soap  
(port 80 issue)

Both Win/Linux

**Active Documents**

## Clients

(Tablet-)PC

Web browser  
Java applets  
X3D/VRML plugIn  
External Applications

**Cool Modes**

**Agent Framework**

Handheld

Open issue: (depends on Scenarios)  
WinCE, SavaJE, Linux, PalmOS ?  
Cheap vs. High End  
IR device  
Java, X3D, Cool Modes

## Experiment

Telescope

45cm Cassegrain Telescope (UCH)

25cm Schmidt-Cassegrain Telescope (UPM)

Mindstorms / RCX

lejOS

**Development tools:** 3D Studio Max, Java



# Common Server Configuration

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- Common software suite for servers
  - Apache HTTP Server with support
    - for Java Servlets (Tomcat)
    - XML and XSLT
    - Simple Object Access Protocol SOAP (allows remote procedure calls through firewalls (port 80 issue)).
  - This software suite runs both on Windows and Linux
- On top of these technologies the **Active Documents System** has been implemented and is to be adapted to the needs of the project.



# Common Client Configuration

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- **Hardware**

- Standard personal computers and Tablet-PCs.
- In some scenarios handheld computers, but no decision on the operating system (WinCE, SavaJE, Linux or PalmOS) and tools has been made yet. ← scenarios

- **Software**

- Web browsers with support for
  - Java-Applets, Java Webstart for external applications
  - X3D/VRML-PlugIn



# Toolbox Documentation

- For each tool:
  - General description (purpose)
  - Technical description
  - **Example of use in scenarios**
  - Advantages and disadvantages
  - Missing parts





# Toolbox Documentation

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- Software Tools provided by Project Partners
  - Active Documents (AD)
  - Cool Modes
  - INESC-ID Agent Framework
- Third Party Software Tools
  - Apache
  - Java
  - X3D
  - 3D Studio Max
  - leJOS
- Third Party Hardware Tools
  - RCX and Lego MindStorms (tm)
  - Telescopes



# Toolbox Description

## Cool Modes

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A collaborative framework designed to support discussions and cooperative modelling processes with visual representations.

### **Technical Description**

- Allows to define visual representations together with their underlying semantics externally
  - domain-independent “plug-in visual languages” encapsulated in so-called “reference frames”.
- Replication framework MatchMaker TNG allows to flexibly synchronise workspaces (fully or partial) to support the collaborative modelling task.





# Toolbox Description

## RCX

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The RCX is the programmable "brain" for robots which can be created with the Lego Mindstorms construction kits.

### Technical Description

- Programmable Lego Brick
- 32k Ram
- Possible to connect 3 sensors of different types
  - Touchsensor
  - Temperature
  - Lightsensor
  - Humidity
  - ...
- Java Virtual Machine available

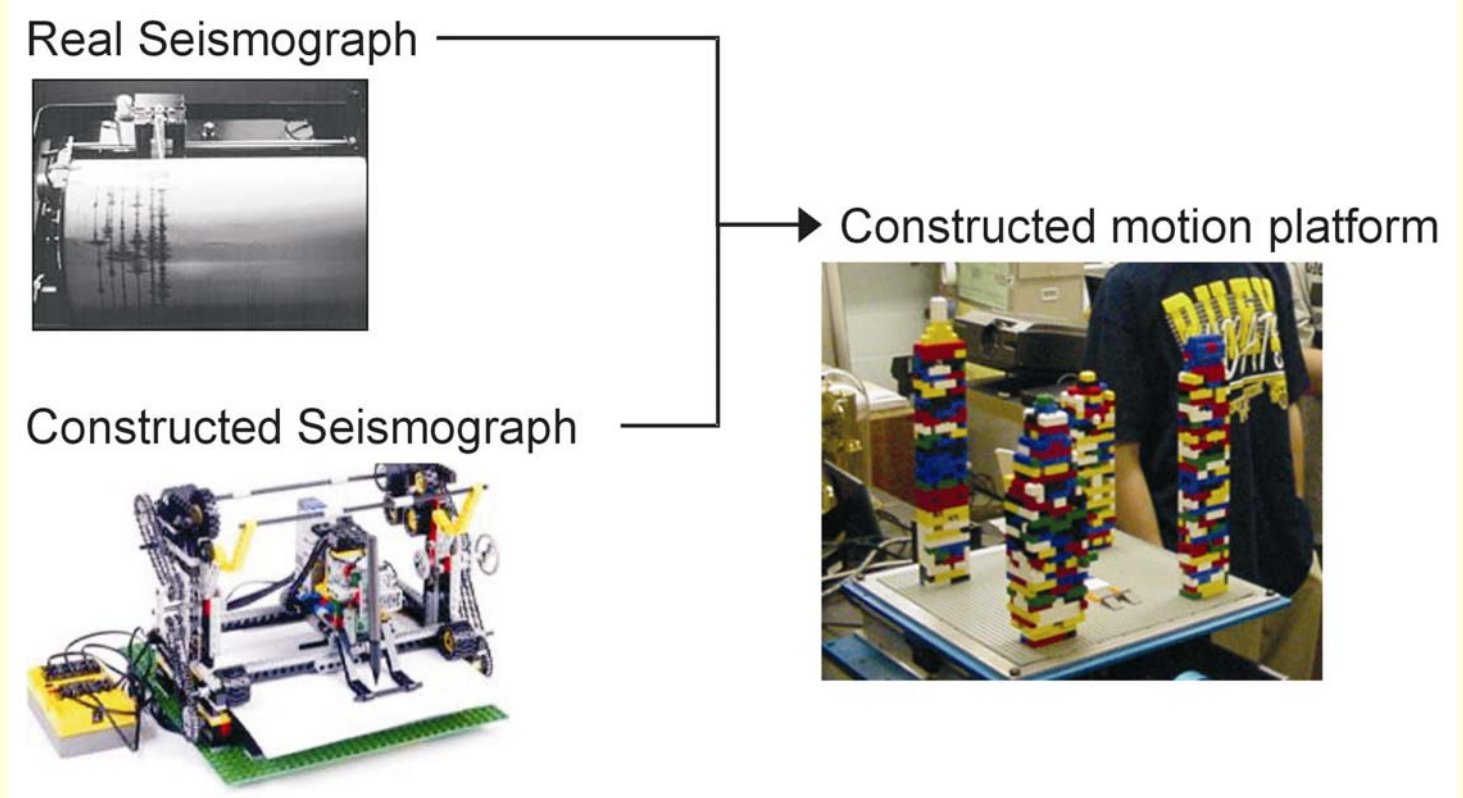




# Toolbox Description

## RCX

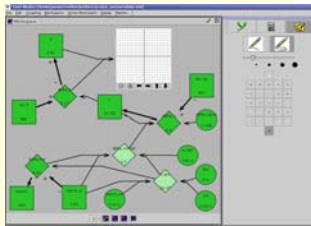
### Use in Scenarios





# RCX and other Tools

- **Cool Modes**



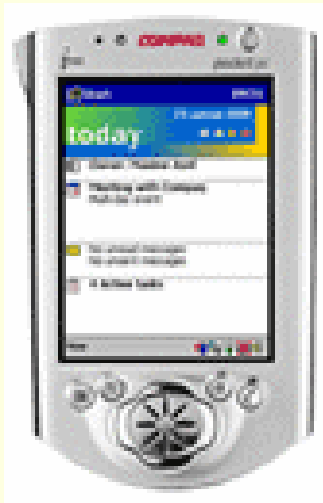
Control

Data Collection

**Bandwidth problem!**



- **PDA's**



Mobile Control

Mobile Data Collection

**Work in progress!**



Asynchronous  
Data Collection

(Realtime ?)



# Conclusion

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- Presented goals, process and results of WP3
- Some feasibility tests have been performed with hardware tools to find out limitations
- External software tools are mostly open source
- Prototypes of tools developed in the project are available, but extensions and integration of tools will be continued as part of other work packages
- Toolbox documentation is available