



## Software Development Report

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## 1. The ACT-NET (LEVEL5) Software

In the preliminary project a first rather rudimentary software approach was developed. Instead of a simple update of the software the responsible partners (BUPNET and the programmers) decided to go for a complete relaunch.

Main reasons were:

- Changes in the original evaluation procedure
- Modifications in regard to target groups
- Necessary changes in regard to the design and the visualisation of the procedural flow

The conceptual phase for the programming started in early 2009, when the design of the cube model (three axes and the 5-level scaling) was adopted by the partners.

There are always systematic problems when translating the demands and wishes of the “spiritual parents of a system” into the programming, especially if the clients are not at all acquainted with computing.

The programmers work on a level on which every single sign, every bit is important for the functioning of the software. A working culture of trial and error is absolutely not acceptable in their developing processes.

This working culture was relatively far away from the open, communicative and sometimes abductive way in which ACT-NET developed its approaches.

Apart from these collaboration problems the fundamental challenge of the project – the multivariable approach was an additional obstacle in designing, conceptualising and programming the IAS software.

In short, the working hypothesis for the programmer and the software development team consisting of the project manager, one internal programming expert as coordinator and one system designer plus the external programmers had to develop software that is able to

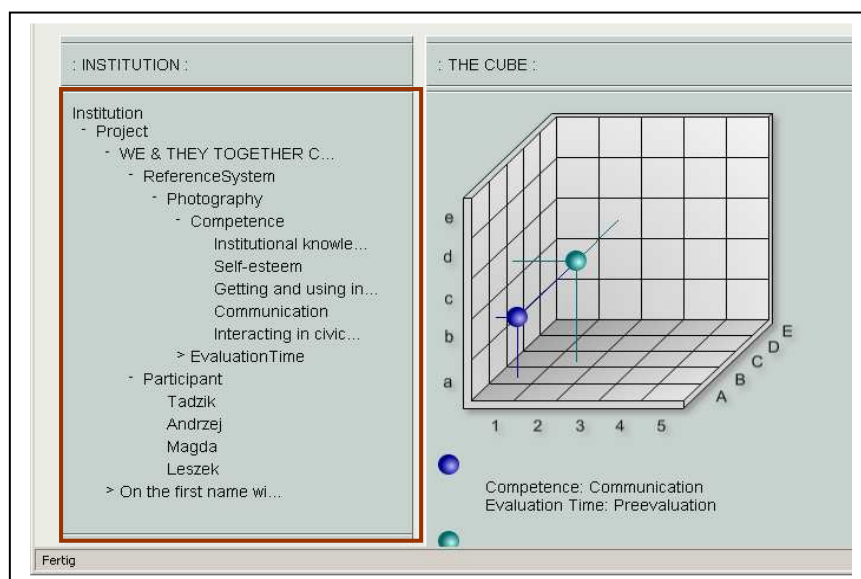
- Evidence competence in a scale in which
- Competencies and scales may change in content and other values.

This means that the software had to be able to display results in an open reference system thereby enabling the users to redefine their descriptions.

This was to be achieved with a system consisting of five grades on three dimensions each, which are selectable from a catalogue of more than 20 topics (competencies) each of them belonging to one specific context (micro-project) carried out by a different organisation. Not to forget that each single grade must be related to a certain person in this context.

To emphasise again the challenge for programming, two examples are presented from the old software:

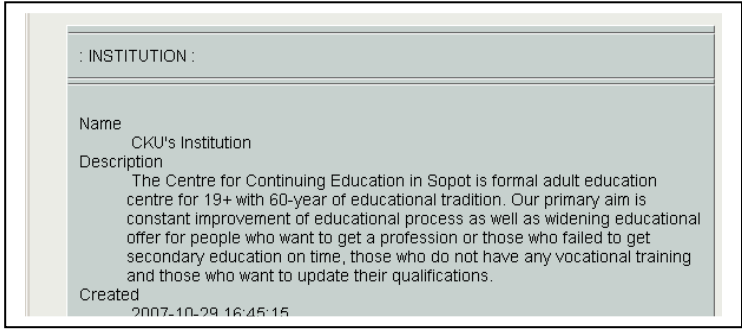
1. The learner in the Polish project mentioned above
2. A learner in a European project by one of the German partners



The first project was already described. All elements are displayed in the navigation tree on the left side of the screen:

- Available project(s)
- Reference systems
- Selected competences
- Evaluation times
- Participants

Figure 1: Navigation tree for the Polish project

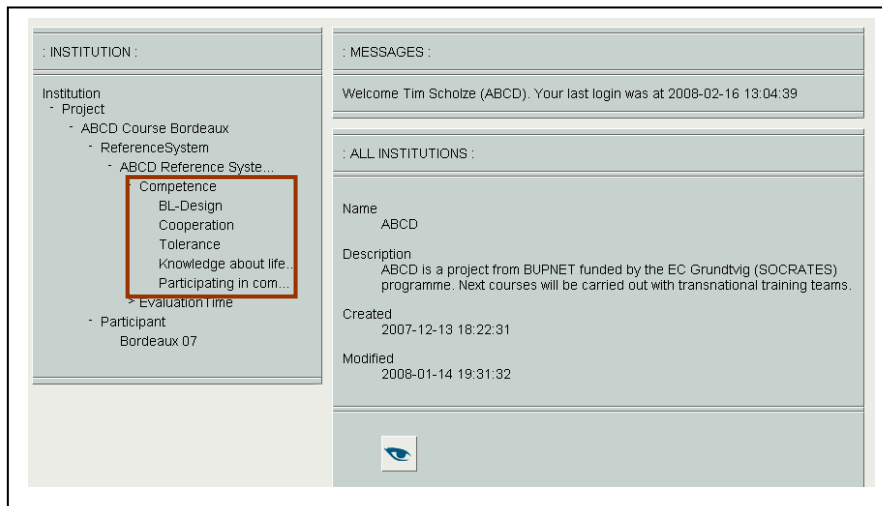


The project belongs to the institution CKU and the respective description can be accessed by clicking on the respective navigation point. All details are editable, not with regard to the institution but also concerning the project, selected topics and their related scales on the three axes, the participants

and the evaluation times.

All these details are, on the one hand, completely variable, but on the other, they are also related to each other.

In the second example an evaluation of a non-formal course by the German partner is displayed.

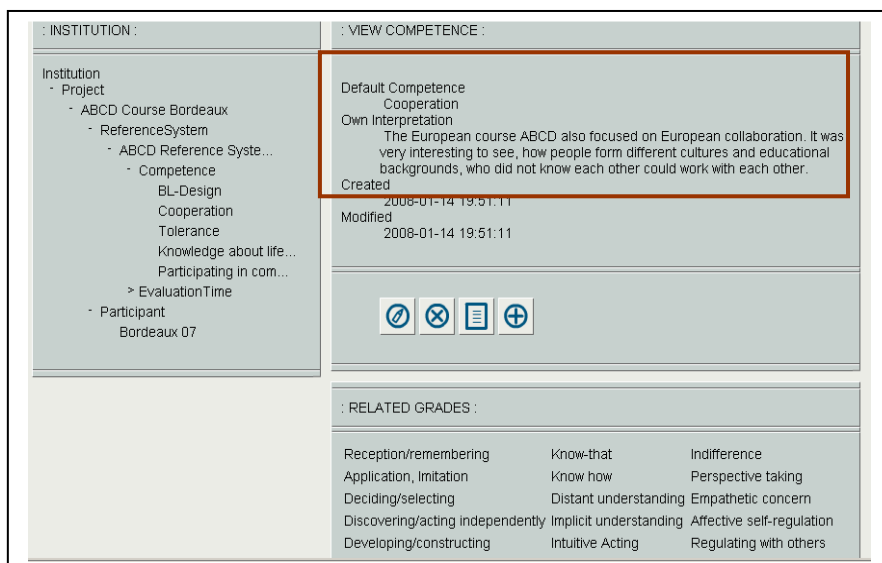


It has a group of participants and topics that differ completely from the first project:

The selected competencies are:

- Cooperation
- Tolerance
- Participating in community
- Knowledge about life of others.

The topic “cooperation” is highlighted as follows: “The European course ABCD also focused on



The topic European collaboration. It was very interesting to see, how people form different cultures and educational backgrounds, who did not know each other, could work with each other.”

The different grades are displayed at the bottom of the page and can be accessed and edited.

Figure 3: Definition/specification of cooperation (German project)

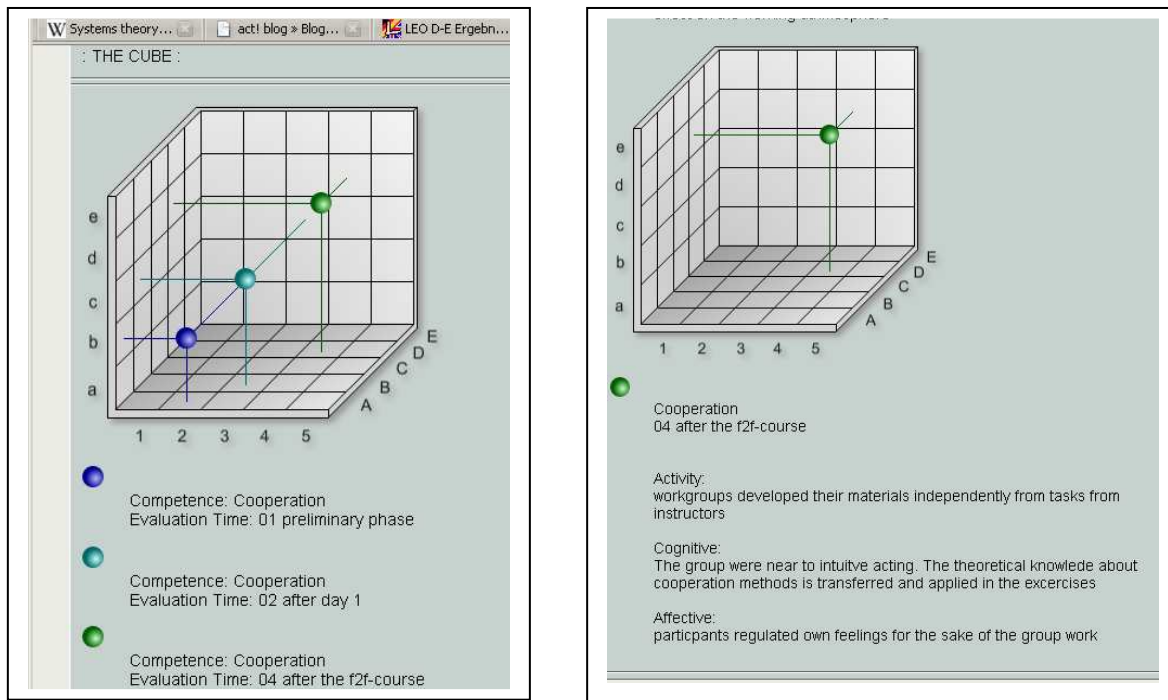


Figure 4: Evaluation of the topic “cooperation” in the European course ABCD (German project)

The cooperation competencies in the course increased in the course of the non-formal learning event (left screenshot). The right screenshot displays the state assessed at the third evaluation time (at the end the course). The evaluators documented their rating and the remarks are displayed under the cube.

## 2. Software Relaunch

### 2.1 Conceptualising the Software

The two examples reveal the performance and the operative efficiency of the software. The requirements of the system afforded a multivariable system.

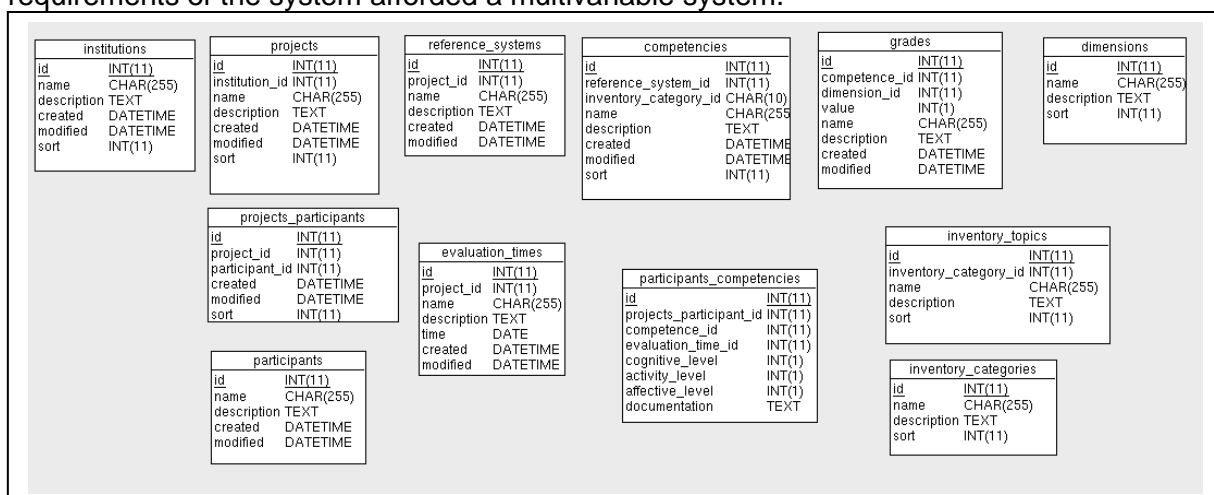


Figure 5: IAS software data model

The system is a cascade of nested containers. Each container is a singular database for different purposes (institutions, projects, reference systems, topics/competences, grades and dimensions) that are connected with other databases over predefined interfaces. As a matter of fact, it is necessary to take into account the participants and the evaluation times.

The interdependences of the different system containers are displayed in the technical chart (data model) showing the different data tables and their relations.

## 2.2 Prototype development

The interdisciplinary work group developed software scenarios on the basis of concrete case studies after the BCN meeting. For this purpose so called “use cases” were created to identify the different “procedures” that the software will represent. Parallel, the system designer created a completely new outlook in design and layout of the software.

### Consistency tests

After a programming time of approximately six months a first web-based prototype with Provisional User Interfaces (data masks) on a lower level will be presented in November 2009 during the third meeting to the partners.

After debugging, the referential integrity of data is safe. After further debugging and test runs with another ten complete exemplary datasets, the system will run in a stable beta version.

## 2.3 Optimisation of the User Interface (UGI)

The UGI will be modified in order to be accessible by several users. In the pre-test, the projects are only designed for one user. The multi-user access has been developed by employing a so-called access control scheme (ACL access control list).

Simultaneously, the design is being adapted to the ACT Corporate Identity (CI).

The new software design has been consecutively introduced from March 2009 onwards.

The procedural steps are displayed in a system using a cardbox metaphor. As soon as one step is accomplished a new navigation element appears on the left side of the website.

The main elements are displayed in the following screen shots:

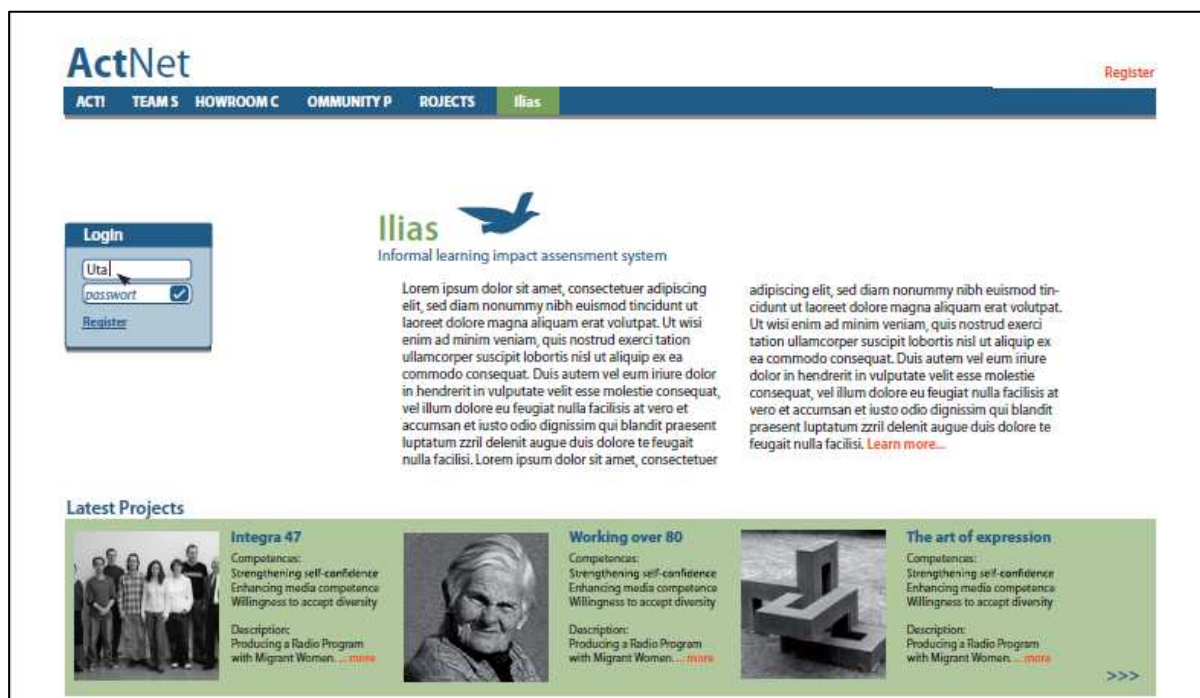


Figure 6: Entry page in the IAS according to the first design sketches

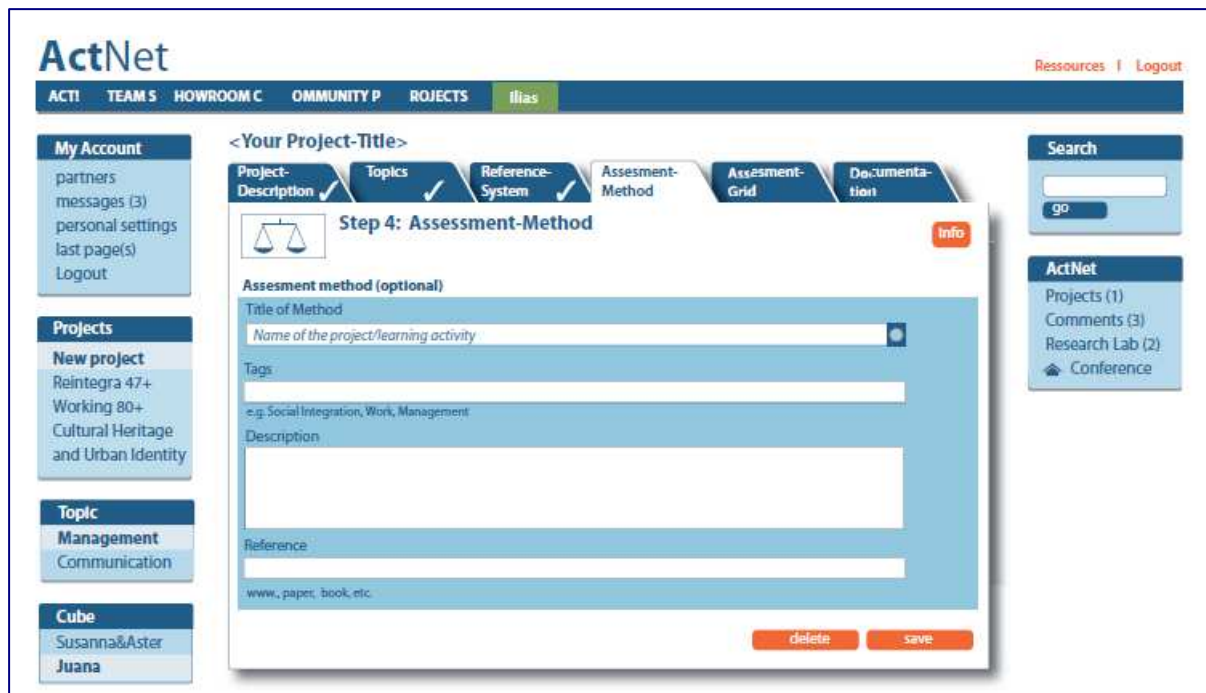


Figure 7: Basic Working Stage (central screen) and navigation columns in left and right side of the screen

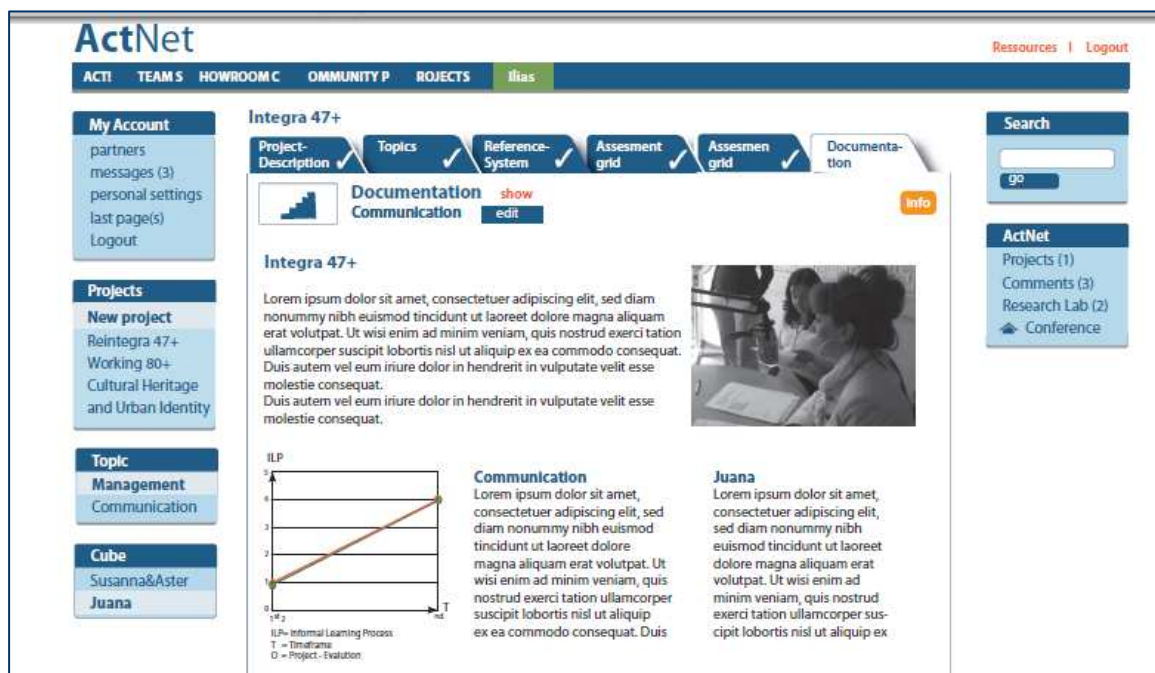


Figure 8: Last documentation step active in the software

## 2.4. Data Integration

In the following step, the data of the partner projects were integrated in the Beta Version of the software:

- institutional descriptions
- project descriptions
- selected competences and descriptions
- reference system descriptions
- ratings of the assessments and their documentations
- specifications of participants and evaluation times.

After the first trials in early 2010 it was obvious that another interim development phase had to be integrated because especially those partners with only little IT experiences and a positive attitude towards an interim product could not be positively integrated into the development process.

This is an important lesson in regard to a software development project within a LLP-project – one has to respect diversity and cannot expect every team member to be open for experiments.

As consequence a special team of partner 2 concentrated on the further optimisation of the software and communicated interim stages to the whole partnership. This was done during the partner meetings in Gothenburg, Alden Biesen and Göttingen. During these workshops the ideas of the partners were collected and integrated in the software development.

This way, very valuable new developments could be realised:

1. Step 1: Integration of new project descriptors; Integration of the concept of project owners (to solve the problem, if evaluators evaluate a project from another institution: to whom does it belong? Consequently a shift from owner to owner was arranged that enabled evaluators to assign their project to other institutions.
2. Step 2: Inventories: The concept of topic sets was created. The logical problem occurred that, if several topics were chosen for a specific project they had to be comprised as a fixed “set” since the topics themselves had to be modifiable. This led to an extremely difficult programming concept since it afforded to create variable instances within the process of the software. Therefore the topic sets had to be locked between step 2 and 3 to avoid inconsistencies and malfunctions of the software.
3. Step 3: Reference systems. Basically there was no change on this step during the testing phase. The accomplishment of levels was symbolised by different filled levels in the visual metaphors (head, hand a heart) which was well accepted by the testing persons.
4. Step 4: Assessment: The assessment methods were integrated as descriptive patterns and different evaluation times can be integrated as different time stamps.
5. Step 5: Grading, documenting, certification: The last step was certainly the one that was modified to the utmost effect for the evaluation.
  - a. Certificates: First of all it was decided that the learning outcomes should be automatically generated into learners’ certificates. This seemed to be an appropriate idea since there is no such system for the evidencing and documentation in non-formal and informal learning. The idea was to give evidence of the learning progress also in those settings and for those target groups that normally do not get any proof of their learning.
  - b. Cube model:: After the extensive work on the scaling of the cube (based on a vectorised model) the integration of the cube model in the certificate was possible. However to show a clear picture the dimensions were compiled separately as 2-d visualisations.
  - c. Editing mode in the certificates. One of the major programming operations was realised when it became obvious that the evaluators would insert their descriptions into the software without having in mind that some of them would appear in the certificate. This led to another innovative concept and afforded an interim step in the generation of the certificates: It should be editable. Therefore the pattern of the certificate was rebuilt as html page enabling evaluators to edit their certificates.



### 3. Conclusion

The LEVEL5-software evolved into an extremely powerful web-based and stand-alone version.

- d. In the first project phases a whole new concept was developed and installed on the state of the art operating systems (AJAX) that makes it extremely fast as web-based application.
- e. The software was developed based on realistic Use Cases that were delivered by the project partners and coordinated by partner 2. This way a close connection between the programmers and the partners could be realised.
- f. In the extended test phase first a test team and later on all partners could integrate their contents. This was the debugging phase in which also additional features could be implemented.

In the end the software exceeded the expectations in terms of usability and potential since a unique product was created that supports organisations in proving the value of their work and learners to show their learning outcomes in informal and non-formal settings

### 4. Access to the LEVEL5-Software and Stage of Development

The LEVEL5 software is available in two versions:

1. the web-based version which is the overall database containing all projects that agreed to collaborate and follow the idea to share certain data sets (such as topic sets for similar projects)

The web-version can be accessed via:

<http://reveal-eu.org/index.php?id=108>

From this page two links lead to the LEVEL5 web-version:

- a. The first one links to the central database for registered users and evaluators.
  - b. A demo version can also be accessed on the second link on that page,  
user name: act-net  
demo password: level5
2. The stand alone version which can be installed on the desktop of your computer like all other normal software. (The complete installation is supplied with the CD-ROM for the final report with 10 exemplary projects containing one learner)

#### Warning:

The current version of LEVEL works with all browsers except the Microsoft Internet Explorer due to constant design problems due to proprietary issues created by Microsoft.

If opened with IE browsers some design problems may occur with the use of LEVEL5.

It is therefore highly recommended to use other browsers like Mozilla Firefox, Opera or others.

## 5 Website Adresses

### 1. [www.reveal-eu.org](http://www.reveal-eu.org)

reveal-eu.org is the website of the network that will be further developed:

It contains interactive features like:

- the WIKI for the informal learning patterns (<http://reveal-eu.org/index.php?id=102>),
- the asynchronous collaboration space (<http://reveal-eu.org/index.php?id=98>)
- the entrance to the online room (<http://reveal-eu.org/index.php?id=97>)

From this website also the web-version of the LEVEL5 software can be accessed (<http://reveal-eu.org/index.php?id=108>)

The page contains a link to the protected user section but also offers a link to the demonstration version.

Each partner submitted a demonstration project to this section. The can be accessed with the following usernames and passwords:

No	Username	password
1	unikassel	act-net
2	bupnet	act-net
3	berater	act-net
4	aldenbiesen	act-net
5	belies	act-net
6	insup	act-net
7	ceso	act-net
8	cku	act-net
9	apower	act-net
10	afig	act-net

The LEVEL5 software delivered on CD may be installed on the desktop as standalone version. It is delivered with a portable Mozilla Browser. It contains the demo projects by the partners and can be accessed with the same usernames and passwords.

If you are working in the internet with a Mozilla Browser you are asked to shut it down in order to avoid conflicts.