Project no. 027087

TENCompetence

Building the European Network for Lifelong Competence Development

Project acronym: Integrated Project TENCompetence

Thematic Priority: 2.4.10

Detailed Implementation Plan month 25-42
(short version without financial details)

Start date of project: 01-12-2005  
Duration: 4 years

Version 1.1

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1. General description and milestones

1.1 Introduction

This document forms the Detailed Implementation Plan (DIP) for the third planning period (DIP-3) of TENCompetence, covering months 25-42. The present document is based on:

- The Description of Work, and then especially chapter 6 ‘Outline implementation plan for the full duration of the project’, and chapter 9 ‘IP Effort Form’ and ‘Budget’.
- The Periodic Activity Report Year 2, with an emphasis on the lessons learned and related technology strategy alignment.

As DIP-3 marks the start of the second half of the project, this is the proper moment to take stock not only of the progress made, but also of the project strategy. To this end this chapter covers the overall project phasing (section 1.2); an analysis of the present status, challenges, and the implications for the project strategy and DIP-3 activities (section 1.3); and the milestones for DIP-3 (section 1.4).

1.2 Relation to overall project planning

The annual upgrades of the DIPs relate to the three project cycles as follows:

<table>
<thead>
<tr>
<th>Cycle 1</th>
<th>Cycle 2</th>
<th>Cycle 3</th>
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<tbody>
<tr>
<td>DIP-1 (DoW chpt. 8)</td>
<td>DIP-2</td>
<td>DIP-3</td>
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<td>1</td>
<td>12</td>
<td>24</td>
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Figure 1: Project cycles and DIPs

1.3 Year-2 internal review outcomes

In this section we provide an analysis of project progress and identify the major challenges for the future (1.3.1); define four strategies to meet these challenges (1.3.2); and provide an update for the major activities as described in the DoW
chapter 6 ‘Outline implementation plan for the full duration of the project’ as guiding principles for DIP-3 activities. (1.3.3).

1.3.1 Taking stock and facing challenges

Mid-way the project, TENCompetence has delivered both a first version of the technical infrastructure - the Personal Competence Manager (PCM) version 1.0 - and the organizational infrastructure - the TENCompetence foundation. Together these provide the basic TENCompetence proof of concept. In addition all Work Packages submitted their planned deliverables - reports and software - to the Commission, and the PCM was validated through pilots. These milestones indicate that the project is well under way.

At the same time, mid-way the project, it has become clear that we face a number of major challenges:

1. Software development cycles
2. The world changes
3. Collaboration within and between WPs
4. Common ground
5. PCM usability

These challenges are further elaborated and detailed in Section 1 of the Periodic Activity Report Year 2.

1.3.2 Addressing the challenges

The five challenges identified on the basis of the mid-term review are closely interrelated. The following set of strategies will be applied to address these challenges. The implications for the second half of the project, and the DIP-3 activities specifically, are covered in the next section (1.3.3).

Focus on core output

Although the overall output of TENCompetence over the first two years is quite impressive, we experienced problems with timely software delivery. At the same time the lack of suitable existing Open Source services - like for example QTI tools - requires additional - initially unplanned - development efforts. This dilemma can only be tackled by a re-orientation on the core tasks of TENCompetence.

Under DIP-3 therefore a distinction will be made between ‘core tasks’ with about 80% of effort dedicated to them, and ‘additional tasks’ to which WPs can direct their remaining time. Such core tasks focus on creating prioritised software components - core components. A core component qualifies as such when it covers a distinct usage profile (to be elaborated below). A core component should therefore be used and tested by/with end users. Some aspect WPs may have more than one core, which will be developed in order of priority.

In addition to focussing on core components, the PCM architecture will allow the integration of existing web tools that users require, but which are not core to the project (like chat, forums, etc.).

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1 A more elaborate review and analysis is contained in ‘Periodic Activity Report Year 2’. TENCompetence – IST-2005-027087
Increase usability: usage profiles and web clients
To make the TENCompetence technical infrastructure more attractive to individual users requires a) shielding these users from functionality that is not required for their role and/or task, and b) creating interaction designs tailored to the users’ specific roles and/or tasks. This will be realised through the creation of ‘usage profiles’. Such a usage profile only exposes the functionality required for a specific task; uses a vocabulary that fits the users’ role and/or task; has an intuitive interaction design; and has an attractive graphical interface design.
To lure new users used to web 2.0 tools we need attractive web clients\(^2\) to replace the present rich client platform (RCP) of the PCM over time. Such web clients have to incorporate web2.0 principles to meet present day’s user expectations. Usability tests will be carried out on all components delivered.

Figure 2: Examples of high priority usage profiles rendered through web-clients to replace present RCP functionality.

Increase programming output
The review of the first two project years revealed a delay in software delivery, and at the same time it was concluded that more emphasis should be put on developing web clients to pull in new users in addition to the present rich client functionality that mainly appeals to ‘power users’.
As a result programming efforts will shift from rich client development to web client development, and at the same time overall development capacity needs to be increased. Recruiting additional staff proved difficult over the past year, and training junior staff is time-consuming and makes further demands on the already overburdened senior programmers.
To facilitate a realistic development process, given these constraints, under DIP-3 we will employ the following set of strategies:

\(^2\) Tools that can be directly accessed and used through a browser, and that do not require any software to be installed on the user’s PC.
a) No further extension of present functionality of the integrated rich client PCM v1.0, but only: a) implement present placeholders; b) resolve CRUD\(^3\) discrepancies with the present prototype implementations of the aspect Work Packages; and c) improve its interaction design (most of the latter to realise in the first quarter of DIP-3).
b) Steer development efforts from developing a fully integrated rich client PCM (as under DIP-2) towards the implementation of distinct usage profiles.
c) Preferably implement the usage profiles as web clients, with the first batch of web clients on the basis of already existing PCM services (the version available at the start of DIP-3).
d) Implement rich clients only when a) they have almost been completed already, or b) functionality is otherwise difficult to implement (as with an integrated LD authoring and deployment environment in WP6). The usage profiles that are completed as rich clients for ‘power users’ may next be developed as web clients for less demanding users.
e) The present integrated rich client PCM will only be ‘maintained’ by integrating new rich client usage profile implementations as they become available.
f) The web clients will be developed using tools a) with which the present developers are already familiar, and/or b) that have a relatively low entry threshold, thus make it easier for inexperienced programmers within and outside the partnership to contribute to their development.
g) The different architectural layers - services, rich clients and web clients - will be developed and maintained by distinct development teams recruited from various partners, and headed by senior programmers.
h) Special activities like code bashes and training events will be initiated to coordinate knowledge exchange and cooperation between these teams.

Creating common ground and a shared vision
Creating common ground and a shared vision in an integrated project proves a major challenge, even after two years, between as well as within WPs! The following measures are required to address this:

- Identify the basic issues where common ground is lacking (this is a technical as well as a vision issue).
- Create attractive training environments that make it very clear (by maximizing cognitive dissonance through questioning) where the discrepancies are.
- As aspect WPs till now had fragmented knowledge of what was going on in WP3 and the other aspect WPs, each team should keep updated with the latest version of the PCM services and the usage profile implementations in the other WPs.
- People within WPs should collaborate more. Teams should work on the same agenda collaboratively; people should be assigned to project tasks on the basis of their competences rather than on the basis of organizational affiliation, and fixed weekly online meetings should be scheduled for joint tasks.
- WP9 will provide specific mechanisms to introduce new persons to the project, to exchange knowledge between development teams, and to train staff where necessary.

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\(^3\) Create, Read, Update, Delete actions on data base fields.
1.3.3 Implications for planned project activities

The DoW chapter 6 ‘Outline implementation plan for the full duration of the project’ describes the project approach in terms of four activity clusters:

- Research, technology development and innovation
- Demonstration activities
- Training activities
- Consortium management

Based on the analysis provided above, we now describe the major implications for each of these four activity clusters. This reflects an update of chapter 6 of the DoW on the basis of lessons learned rather than replacing it!

1.3.3.1 Research, technology development and innovation activities

Architecture

In the second project year the TENCompetence technical infrastructure that was developed and piloted comprised:

- The integrated Personal Competence Manager version 1.0 (PCM v1.0), implementing a client-server architecture. The PCM v1.0 already incorporates most of the functionality that the final system is expected to contain, though with some placeholders. The PCM v1.0 was validated in two formal pilots.
- A number of ‘proof of concept’ software components, together with their application programming interfaces, for future integration into the PCM. These software components were user tested as part of their delivery procedure.

Under DIP-3 we plan to realise full PCM functionality through an architecture where the PCM server exposes services that will be consumed mainly by web clients and in some cases by rich clients. These (web) clients provide a low threshold entry-point for users, and their functionality will be described in terms of ‘usage profiles’. In addition to exposing PCM services the architecture also caters for inclusion of third-party web services (especially in the case of WP5) and ‘dedicated’ services to be developed by individual aspect Work Packages. Widgets will allow the integration of the clients as iframe, flash or RSS in web portals or open source (web) platforms like ELGG⁴ (social networking) of Moodle (LMS).

⁴ See http://elgg.org/
This versatile architecture with dual client interfaces (web clients and rich client) will be realised through a phased approach to make it manageable:

During the first six months (till May 2008) work will concentrate on:

- Realising the first five high-priority usage profile implementations as a mix of web-clients and integration components for the RCP (see figure 2). The clients developed in this period will only consume the services provided by the present PCM server v1.0. (version available at the start of the DIP-3 period).
- Designing additional usage profiles for implementation after May 2008, five of which have already been identified.
- Elaborating (extending existing and adding new) PCM services in preparation for additional usage profile implementations after May 2008.

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4 Four out of these five are already defined in D2.2, delivered at the end of DIP-2.
Creating the TENCompetence metadata repository, which integrates business objects exposed by the various services and links to various resources/learning activities/units of learning. Each usage profile implementation links to this tool.

In the last twelve months (June 2008 - May 2009) we will:

- Elaborate existing, and realise additional, usage profiles as web clients and related widgets. In case this requires additional services (and possibly underlying data stores) that are consumed by more than one (web) client, these may be incorporated in the PCM server. Services required by one (web) client only, may be implemented as a dedicated service.

Some of the usage profiles are closely linked in terms of user functionality and data used. These are ‘Create course’ and ‘Follow course’, and ‘e-Portfolio’, ‘Personal Development Planning’ and ‘Competence assessment’.

Integration

The TENCompetence infrastructure will thus NOT comprise a silo system but will consist of mainly web clients with some rich clients where functionality or user needs requires this (mainly WP6). This implies that TENCompetence only develops new functionality and will not duplicate existing services that already exist in other (open source) applications such as chat, mail, for a etc.

Integration of the various clients will take place though the following mechanisms:

- All clients (usage profile implementations) use the same underlying set of services exposed by the PCM server.
- The clients provide a consistent user interface, based on project guidelines.
- The clients use a shared metadata repository.
- Regular code bash events provide the mechanism for developers to resolve any remaining integration issues.

At the GUI level the clients are to be integrated in/accessed through existing (web) portals, (open source) social networking or learning management platforms. These GUIs are thus NOT part of the project deliverables but will be provided/managed by the user community/organization.

Development tools

The selection of development tools for this versatile architecture is based on: a) project principles (open source); b) a strong preference for a web2.0 approach, look and feel; c) the requirement that tools should preferably have a low entry threshold; and d) practical considerations like programmers familiarity with tools. Development coordination and tools selection is depicted below.
Figure 4: Development coordination and tool selection

Coordination and collaboration between the partners within the aspect Work Packages will be increased through weekly virtual meetings to stimulate participation, increase the tempo and synchronise efforts. Coordination between WP2, WP3 and the aspect WPs will be improved by regular face-to-face and on-line coordination sessions.
Component specification and development

Work Package 2

WP2 under DIP-2 already specified five high-priority Usage Profiles (see deliverable D2.2) that will be implemented by the aspect Work Packages before May 2008. These are:
- ‘Share knowledge in a community of practice’
- ‘Create LD course’
- ‘Follow LD course’
- ‘Create and use personal development plans’
- ‘Exploring resources, persons and competence profiles’

Under DIP-3 WP2 will be responsible for defining two more Usage Profiles:
- ‘e-Portfolio’ (to be developed during the Winterschool)
- ‘Competence Assessment’

These will be based on the high-level use cases and descriptions provided by the WP2 Vision Group.

WP2 will also be responsible for:
- Assessing and prioritising change requests for PCM services received from WP5-8, which will then be implemented by WP3 (see below)
- Defining the functional requirements for the integration of new rich client components into one integrated RCP, including its interaction design.
- Defining the functional requirements for the ‘TENCompetence portal’, integrating the various web clients.
- Design the PDP rich client tool (implementation of Usage Profile ‘Create and use personal development plans’) that will replace the planning window in the present PCM RCP.
- Providing overall guidelines for the graphical user interface of the various client implementations to secure a common look and feel between these clients.
- Functional acceptance testing of the integrated PCM.

Work Package 3

WP3 will concentrate on improving existing services, developing new services, and releasing these services to be consumed by the web clients built by the aspect Work Packages (implementing the Usage Profiles). The requirements for adjusted/new services will come from the aspect Work Packages, derived from implementation requirements of the usage profiles. Such requirements will be evaluated and prioritised by WP2 (see above) in consultation with WP3, after which WP3 will implement them.

WP3 may also build frequent releases of the integrated PCM based on the components delivered by the aspect Work Packages (see next). In building PCM releases, WP3 will start with testing the technical quality of the delivered components, taking figure 4 as a reference (functional quality of the components however will be secured by the aspect Work Packages themselves through user tests).
WP3 will also develop the PDP rich client tool (implementation of Usage Profile ‘Create and use personal development plans’). This rich client component will replace the planning window in the present PCM rich client. The required underlying positioning and navigation services for this will be delivered by WP7 (see below).

**Work Packages 5-8**

WP5-8 will each concentrate on implementing their ‘core’ usage profiles provided by WP2 under DIP-2 as a mix of web clients (preferably) and rich client components (only when a web client implementation will not be able to provide the required functionality). This includes technical design, programming, development of widgets, and usability testing of the web- and rich client implementations. Work on these cores will take up the majority of capacity (around 80%) of the aspect Work Package effort. Clients will be user-tested within the aspect Work Packages themselves. Clients to be released in May 2008 will only use existing services (and related data stores) already exposed by the PCM v1.0. (this is the version available at the start of DIP-3).

By May 2008 the following usage profile implementations will be delivered:

- **WP5**: ‘Share knowledge in a community of practice’, to be realised largely by selecting, testing and integrating existing web2.0 services. Integration may be realised through a ‘Knowledge sharing home page’ using API’s to connect to underlying software services, but also by providing user guidance on how to use other web2.0 tools (e.g. Flickr, YouTube), to be considered as containers for multimedia resources to be shared. Relating the TENCompetence identity management and grouping strategies to those in underlying - existing web2.0 - services are the major challenges here. The web-services exposed by the WP5 tool will act as a basis for other WPs tools.

- **WP6**: ‘Create LD course’, by integrating visual LD editing, QTI editing, course publishing, assigning users to runs, CopperCore, widget service, QTI service and SLED⁶ into a single, integrated, and easy to set up and use system/rich client component, together with a widget server for integration into the PCM rich client platform. Complementary to this WP6 will implement the ‘Follow LD course’ usage profile through a web client. Work on the competence assessment usage profile will start as part of the non-core (20%) activities in this period.

- **WP7**: Will create and deliver the navigation and positioning tools prototyped under DIP-2 for inclusion in the PDP rich client to be developed by WP3 (implementation of Usage Profile ‘Create and use personal development plans’; see above).

- **WP8**: ‘Exploring resources, persons and competence profiles’ (the ‘Overview tool’ under DIP-2, comprising rich competence descriptions; network visualisation and navigation; and network management) will be integrated as rich client components in the PCM first, and as web clients next. One of the challenges under DIP-3 will be to resolve the present data model discrepancies between the Overview tool and the PCM v1.0.

Figure 5: Planned usage profile implementations by Work Package before May 2008 (left) and after May 2008 (right)

**After May 2008** the aspect Work Packages will concentrate on the following cores:

- **WP5**: Further elaboration of ‘Share knowledge in a community of practice’ and cooperate with WP8 on the ‘Social help’ usage profile. The system will be enriched with browser toolbars for application in real-world scenarios.

- **WP6**: Further elaboration and integration with the other PCM services: integrate course bound assessment; extend authoring functionality with LD level b and c; and extend the widget server. Develop a web client for (simple) authoring and deployment using web 2.0 principles.

- **WP7**: Further elaboration of services in support of ‘Create and use personal development plans’ implementations, and technical design and implementation of the usage profile ‘Matching personal competences on job profiles to create personal development plans’.

- **WP8**: Include connection agents and game dynamics in the ‘Exploring resources, persons and competence profiles’ implementation, and implement the ‘Social help’ usage profile.

In case the new clients to be implemented after May 2008 require additional services (and possibly underlying data stores) the aspect Work Package submit a change request to WP2. If such a service will be consumed by more than one client, it may be incorporated in the PCM server. Services required by one client only (e.g. CopperCore, Widget Service) may be implemented as a dedicated service. Final decisions, including those about implementation priorities, will be made by the WP2 Change Control Board.
1.3.3.2 Demonstration activities

In addition to version 1.0 of the technical infrastructure, TENCompetence has also delivered the basis for the organizational infrastructure during year 2: the TENCompetence Foundation. At the end of year 2 a tender was put out to stimulate the active participation of SME’s. The technical infrastructure was validated through a first cycle of pilots. Under DIP-3 the valorisation activities outlined in the DoW will be implemented through usability pilots and business demonstrators, and by ‘activating’ the Foundation. The Valorisation Committee (advising the Board on valorisation issues) will be consulted for key valorisation issues like reviewing critical milestones related to the business demonstrators and prioritising change requests towards WP2 resulting from these demonstrators.

For the pilot activities managed by WP4 under DIP-3 this implies:

- Executing and evaluating the cycle 2 usability pilots (months 25-36)
- Preparing the business demonstrator pilots (‘real-life demonstrators’; months 25-36)
- Developing tools that assist Associate Partners in participating as clients and service providers in these business demonstrators
- Assisting Associate Partners in the implementation and execution of these business demonstrators as part of cycle-3 (months 37-42)
- Linking to WP9 to secure relevant training for these Associate Partners
- Linking to WP10 to secure proper embedding of these Associate Partners in the TENCompetence organizational infrastructure

Major points of attention for pilots are:

- Pilots should be significant by implementing a combination of usage profiles (the separate usage profile implementations will be user-validated by the aspect WPs themselves), demonstrating the flexible deployment of the TENCompetence technical infrastructure in various settings.
- Pilots should be large enough to demonstrate wide-impact use of the TENCompetence infrastructure.
- The business demonstrator pilots should start including Associate Partners in support roles in preparation for sustainability.

Under DIP-3:

- Each of the eight larger consortium partner will adopt at least one Associate Partner, with whom a real contract as subcontractor will be drawn up (not a mere MoU) to carry out a business demonstrator. WP10 will assist in drawing up the contracts.
- Each of the eight larger partners adopts at least one SME, and the SME fund (total of E. 150.000,-) will be split over these eight instances (about E. 20.000,- each). These funds may be used for:
  - supporting in carrying out a business demonstrator
  - co-development of software
  - The SME will subcontract to the large consortium partner. WP10 will assist in drawing up the contracts.
- Candidates and contracts need to be approved by the Coordinator before signing of the contract.
- In addition partners can of course carry out additional business demonstrators.
All (eight) larger consortium partners will thus prepare and implement a business demonstrator through WP4. Business demonstrators may be executed at Associate Partner organizations, or within the parent organization. In the latter case this should be another unit than the one participating in TENCompetence itself. Preferably however, business demonstrators are executed at Associate Partners, preferably including SME’s as service providers. For this the SME tender funds can be used.

The TENCompetence Foundation has been established in such a way that it ‘copies’ the project aims, structure and planned activities. Starting under DIP-3 therefore, the demonstration and dissemination activities that involve associate partners, subscribers, and the general public will be publicised through a ‘Foundation interface’. The present consortium partners, present associate partners, and the SMEs that will be selected through the tender will be invited to formally join the Foundation. Account management, coordinated through WP10, will be strengthened.

The Valorisation Committee, advising the Consortium Board, will review the major milestones related to the demonstration activities.

1.3.3.3 Training activities

As outlined in the DoW training activities will shift from an ‘internal’ orientation towards focusing on associate partners and other interested external audiences. However, given the earlier identified challenges of ‘the changing world’ and ‘retaining common ground’, internal competence development and retaining common ground through training (WP9) and pro-active internal dissemination (WP10) remains necessary. Also the continuous turn-over of (junior) staff requires special efforts to bring new staff quickly up to date.

Special coordination and training sessions will be organised by WP9 in close cooperation with WP2 and WP3 to secure a common understanding of the design and coordination of the software development activities by the various Work Packages under DIP-3, as depicted in figure 4.

1.3.3.4 Consortium management

The major challenge for consortium management will be 1) to keep focus on the core of the project, and 2) to monitor that people work together effectively. Although this is already partly addressed by WP1 activities in monitoring the delivery of internal deliverables and deliverables, and in conducting the three-monthly project meetings with all partners, more effort will be directed at actively monitoring work within the Work Packages.
1.4 Milestones

Till May 2008 (month 30) development efforts will concentrate on the releasing the web-clients, widgets, and integrated release of the RCP that implement the five high-priority usage profiles on the basis of existing PCM services. From then on, new client releases on the basis of services upgrades are scheduled every four months, to be concluded with a final release at the end of DIP-3 (month 42).

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<tr>
<td>M3  PCM services update + RCP release 3.0 + web clients suite 1.0, covering the first five high-priority usage profiles</td>
<td>30</td>
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<tr>
<td>M4  PCM services update + RCP release 4.0 + web clients suite 2.0</td>
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<td>M5  PCM services update + RCP release 5.0 + web clients suite 3.0</td>
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<tr>
<td>M6  PCM services update + RCP release 6.0 + web clients suite 4.0</td>
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## 2 Planning and timetable

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</table>

Note: The table and diagram represent the planning and timetable for the tasks listed, with the tasks divided into different quarters and weeks. The diagram visualizes the timeline and dependencies between the tasks.
3 Graphical presentation of Work Packages

The type, number, and dependencies between the Work Packages as defined in the DoW remains unchanged.

![Diagram of Work Package dependencies](image)

**Figure 6: Work Package dependencies**
## 4 Work Package list

<table>
<thead>
<tr>
<th>Title</th>
<th>Lead</th>
<th>p.m.</th>
<th>start</th>
<th>end</th>
<th>deliv.</th>
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</thead>
<tbody>
<tr>
<td>1 Consortium management</td>
<td>OUNL</td>
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<td>25</td>
<td>42</td>
<td>D1.3</td>
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<tr>
<td>2 Requirements and analysis of the integrated system</td>
<td>ALTRAN SDB</td>
<td>49</td>
<td>25</td>
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<td>D2.3   D2.4</td>
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<tr>
<td>3 Technical design and implementation of the integrated system</td>
<td>LOGICACMG</td>
<td>89</td>
<td>25</td>
<td>42</td>
<td>D3.3   D3.4</td>
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<td>4 Pilots with the integrated system and validation of the project</td>
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<td>84</td>
<td>25</td>
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<td>D4.3   D4.4   D4.5</td>
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<tr>
<td>5 Knowledge resources sharing and management</td>
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<td>25</td>
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<td>D5.2   D5.3</td>
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<tr>
<td>6 Learning activities and units of learning</td>
<td>University of Bolton</td>
<td>83</td>
<td>25</td>
<td>42</td>
<td>D6.2   D6.3</td>
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<td>7 Competence development programmes</td>
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## 5 Deliverables list

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<th>type</th>
<th>diss. level</th>
<th>month</th>
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<tbody>
<tr>
<td>WP1: Consortium management</td>
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<tr>
<td>D1.3 Periodic Report (covering progress and expenditure reporting over months 25-36), including the DIP-4 for the period covering month 37-48</td>
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<td></td>
<td>R</td>
<td>CO</td>
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<td>WP2: Requirements and analysis of the integrated system</td>
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<td>D2.3 Updated Use Case models based on ID2.9 and Change Requests for Release 3.0 (Formerly ‘Updated functional and non-functional requirements, and process definitions’)</td>
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<td>R</td>
<td>PU</td>
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<tr>
<td>D2.4 Updated Use Case models based on ID2.11 and Change Requests for Release 6.0</td>
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<td>R</td>
<td>PU</td>
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<td>WP3: Technical design and implementation of the integrated system</td>
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<tr>
<td>D3.3 Aggregate of internal deliverables ID3.6, ID3.8, ID3.9, and ID3.22 including updated design and second release software</td>
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<td></td>
<td>R+P</td>
<td>PU</td>
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<td>D3.4 Aggregate of internal deliverables ID3.19, ID3.20, ID3.21, ID3.23</td>
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<td>R+P</td>
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<tr>
<td>D4.3 Report containing internal deliverable outcomes ID4.3, ID4.6, ID4.8 and ID4.11</td>
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<td>PU</td>
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<tr>
<td>D4.4 Report on the results of the evaluation of the cycle 2 pilots</td>
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<td>D4.5 Cycle-3 demonstrators development and implementation tool set</td>
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<td>WP5: Knowledge resources sharing and management</td>
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<td>D5.2 LearnWeb2.0 system evaluation results, aggregating ID5.7, ID5.10, ID5.11, ID5.12, ID5.14, and ID5.18 (formerly ‘Report containing internal deliverable outcomes ID5.3-ID5.10’)</td>
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<td></td>
<td>R+P</td>
<td>PU</td>
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<td>D5.3 LearnWeb2.0 results. Aggregates internal deliverables ID5.13, ID5.15, ID5.16, ID5.17</td>
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<td>R+P</td>
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<td>WP6: Learning activities and units of learning</td>
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<tr>
<td>D6.3 Compilation of internal deliverable outcomes ID6.6 - 6.12</td>
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<td>R+P</td>
<td>PU</td>
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<tr>
<td>WP7: Competence development programmes</td>
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<td>D7.2 Compilation of internal deliverable outcomes ID7.3-ID7.10</td>
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<td></td>
<td>R+P</td>
<td>PU</td>
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<tr>
<td>D7.3 Compilation of materials on learning path description and tools for graphical planning</td>
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<td>R+P</td>
<td>PU</td>
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</table>
Internal Deliverables are used for planning and internal monitoring purposes. Internal deliverables are directly linked to activities, and aggregate into WP deliverables.

Internal deliverable assessment will in principle be the responsibility of the WP leader, while key internal deliverables may also be submitted for review outside the WP (preferably by one of the subcommittees). The coordinator may have internal deliverables assessed externally to the WP.

<table>
<thead>
<tr>
<th>Internal Deliverables description</th>
<th>WP1: Consortium management</th>
<th>WP2: Requirements and analysis of the integrated system</th>
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<tr>
<td>ID1.6</td>
<td>Update of the TENCompetence Handbook on Integrated Quality Assurance</td>
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<td>ID1.7</td>
<td>Three-monthly Internal Consortium Reports</td>
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<td>ID1.8</td>
<td>Informal Interim Activity Report</td>
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<td>ID2.11</td>
<td>Series of documents reporting on vision sessions, linked to the seven problems addressed by TENCompetence - these may be thematic, or address the overall TENCompetence strategy: to be collected into an overall vision document</td>
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<td>ID2.12</td>
<td>Graphical Design Guidelines</td>
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<td>ID2.13</td>
<td>Change Requests for Release 2.0</td>
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<td>Change Requests for Release 6.0</td>
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**WP3: Technical design and implementation of the integrated system**

| ID3.6 | Version 2.0 of the overall design report of the TENCompetence architecture, according to the SOA approach, the requirements from WP2, feedback from the WP4 pilots, the service definitions for the WP3 functionality and the WP5-8 components to integrate and an updated user interaction model | 26 |
| ID3.8 | Second major release of the TENCompetence software, realising version 2.0 of the architectural design report (Milestone 2) | 27 |
| ID3.9 | Updated design for the third release of the TENCompetence software | 30 |
| ID3.10 | Updated API definitions for release 3.0 | 30 |
| ID3.11 | Release 3.0 of the TENCompetence integrative software | 30 |
| ID3.12 | Updated design for release 4.0 of the TENCompetence software | 35 |
| ID3.13 | Updated API definitions for release 4.0 | 35 |
| ID3.14 | Release 4.0 of the TENCompetence integrative software | 35 |
| ID3.15 | Updated design for release 5.0 of the TENCompetence software | 39 |
| ID3.16 | Updated API definitions for release 5.0 | 39 |
| ID3.17 | Release 5.0 of the TENCompetence integrative software | 39 |
| ID3.18 | Updated design for release 6.0 of the TENCompetence software | 42 |
| ID3.19 | Updated API definitions for release 6.0 | 42 |
| ID3.20 | Release 6.0 of the TENCompetence integrative software | 42 |
| ID3.21 | Guidelines describing installation, configuration, maintenance and monitoring of the TENCompetence infrastructure | 42 |
| ID3.22 | PDP client | 30 |
| ID3.23 | PDP client integrating WP7 positioning and navigation services | 36 |

**WP4: Pilots with the integrated system and validation of the project**

| ID4.3 | Execution and Evaluation Plan for cycle 2 pilots | 26 |
| ID4.6 | Evaluation implementation plans for pilots starting in cycle 2 | 30 |
| ID4.8 | Finalize distribution of cycle 2 pilots information | 30 |
| ID4.9 | Evaluation outcomes of cycle 2 pilots of the integrated system | 36 |
| ID4.10 | Execution and Evaluation Plans for cycle 3 pilots | 36 |
| ID4.11 | Pilot implementation methodology | 30 |

**WP5: Knowledge resources sharing and management**

<p>| ID5.7 | LearnWeb2.0 tool (v1) (formerly: KRSM web tool - final release, comprising integrated component/services implementation ready for delivery to WP3) | 30 |
| ID5.10 | LearnWeb2.0 second cycle system evaluation results | 32 |
| ID5.11 | Updated Roadmap as outcome of task 1 running till month 30 | 30 |
| ID5.12 | Interaction models and requirements for a knowledge sharing scenario | 26 |</p>
<table>
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<tr>
<th>ID</th>
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<th>Milestone</th>
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<td>New interaction models and requirements for a knowledge sharing scenario v2</td>
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<td>ID5.14</td>
<td>Core services requirements v1</td>
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<tr>
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<td>Core- and additional services requirements v2</td>
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<td>ID5.17</td>
<td>LearnWeb2.0 tool v2 evaluation outcomes</td>
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<tr>
<td>ID5.18</td>
<td>Metadata editor and repository service</td>
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<tr>
<td>WP6: Learning activities and units of learning</td>
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<td>ID6.4</td>
<td>Integrated Core LD Authoring System</td>
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<td>ID6.5</td>
<td>Validation Testing and Usability Evaluation Results</td>
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<td>ID6.6</td>
<td>Learning activity and assessment pre-authoring tools - 1st Release</td>
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<td>ID6.7</td>
<td>Evaluation report on usability and effectiveness of pre-authoring tools</td>
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<td>ID6.8</td>
<td>Learning activity authoring tools – 3rd release (ReCourse v.2.0)</td>
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<td>ID6.9</td>
<td>Evaluation report on usability and effectiveness of authoring tools</td>
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<tr>
<td>ID6.10</td>
<td>Widget server 2nd release</td>
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<td>ID6.11</td>
<td>Integrated runtime system, 3rd release</td>
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<tr>
<td>ID6.12</td>
<td>Evaluation report on usability and effectiveness of runtime environment</td>
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<td>WP7: Competence development programmes</td>
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<tr>
<td>ID7.7</td>
<td>Prototypical graphical planning tool to be integrated into the PDP</td>
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<td></td>
<td>usage profile implementation developed by WP3</td>
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<td>ID7.8</td>
<td>Usage profile ‘Matching Competences on Job Profiles for Personal Development Plans’</td>
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<tr>
<td>ID7.10</td>
<td>Personalization pipeline, combining the navigation and positioning services, algorithmic curriculum planning and preference-based mechanisms</td>
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<tr>
<td>ID7.11</td>
<td>Completed user study and report on the graphical planning tool</td>
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<tr>
<td>ID7.12</td>
<td>Revised version of the learning path description and validation plan</td>
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<td>Validation of learning path description</td>
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<tr>
<td>ID7.14</td>
<td>Editors for competence and job profiles</td>
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<td>ID7.15</td>
<td>Orchestration of services for competence gap matching</td>
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<td>ID7.16</td>
<td>Competence gap matching interface, making use of the services implemented or adapted in ID7.15</td>
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<td>WP8: Networks for lifelong competence development</td>
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<tr>
<td>ID8.6</td>
<td>Validated release, based on functional testing and usability evaluation results for TENCompetence Competence Observatory prototype</td>
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<tr>
<td>ID8.10</td>
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<td>30</td>
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<tr>
<td>ID8.14</td>
<td>Validated release, based on functional testing and usability evaluation results for TENCompetence Network Management Tool</td>
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<tr>
<td>ID8.15</td>
<td>Rich Competency Profiles Data Model built, integrated and delivered</td>
<td>30, 35, 42</td>
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<tr>
<td>ID8.16</td>
<td>Network Management Model designed, integrated and delivered</td>
<td>30, 35, 42</td>
</tr>
<tr>
<td>ID8.17</td>
<td>Overview Tool, Network Visualisation and Navigation Services, Connection Agents and Game Dynamics (latter components as part of the Social Help usage profile) built, integrated and delivered</td>
<td>30, 35, 42</td>
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<tr>
<td>WP9: Training</td>
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<tr>
<td>ID9.10 Report on Winter School 2008</td>
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<tr>
<td>ID9.11 Report on Training for cycle 2 pilots</td>
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<tr>
<td>ID9.13 Induction programme for new project members</td>
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<td>ID9.14 Project Weblog</td>
<td>32</td>
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<tr>
<td>ID9.15 Report on Competence Network of Associate Partners</td>
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<tr>
<td>ID9.16 Training Package Framework usable for APs - Manual</td>
<td>42</td>
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<td>ID9.17 Usage case training framework - Report</td>
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<th>WP10: Dissemination and exploitation</th>
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<tr>
<td>ID10.3 List with contacts, potential users, subscribers and associated partners (ongoing, consolidated version)</td>
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<tr>
<td>ID10.6 Report on TENCompetence standardisation initiatives, gathering together and presenting standardisation initiatives and outcomes provided by other WPs</td>
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<td>ID10.7 Compendium of workshop papers, special issues and book chapters edited by TENCompetence</td>
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<tr>
<td>ID10.8 Overview of workshops and events organised by TENCompetence and their impact</td>
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<tr>
<td>ID10.9 Report on TENCompetence standardisation initiatives, gathering together and presenting standardisation initiatives and outcomes provided by other WPs</td>
<td>42</td>
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<tr>
<td>ID10.10 List with contacts, potential users, subscribers and associated partners (ongoing, consolidated version)</td>
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<tr>
<td>ID10.11 Updated business models (first draft ready in month 36)</td>
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6 Work Package descriptions months 25-42

### WP 1: Consortium management

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**Objectives**

1. To ensure the realization of the project objectives as defined in the WP descriptions.
2. To monitor the timely delivery of internal deliverables and deliverables.
3. To monitor quality standards.
4. Ensure that results are achieved within budget.

**Description of Work**

This Work Package is responsible for the overall management of the consortium and the fulfilment of its obligations as defined in the contract. It aims to realise the project objectives by the timely production of deliverables, meeting pre-defined quality criteria, and within budget and legal requirements.

**Task 1.1. Keep partners informed on, and monitor the proper execution of, project procedures**

This activity involves updating the Handbook in month 27 (ID1.6) to take into account the lessons learned under the previous reporting period and elaborating procedures related to this specific project phase, e.g. software quality assessment procedures.

**Task 1.2. Assist the Board in overall progress monitoring and quality assurance**

This covers facilitating the three-monthly internal reporting procedure, and analysing and reporting on this to the Consortium Board in months 27, 30, 33, 36 through ID1.7.

**Task 1.3. Coordinate progress and financial monitoring and reporting to the Commission**

This covers managing the reporting obligations towards the Commission through the Informal Interim Activity Report in month 30 (ID1.8).

**Task 1.4. Coordinate plan development for the next 18-month project cycle**

This covers organising and delivering the Periodic Activity Report, Periodic Management Report, and Detailed Implementation Plan for months 37-48 (D1.3).
### Deliverables

- D1.3: Periodic Report (covering progress and expenditure reporting over months 25-36), including the DIP-4 for the period covering month 37-48 (month 36).

### Internal deliverables

Resulting from task 1.1:
- ID1.6: Update of the TENCompetence Handbook on Integrated Quality Assurance (month 27)

Resulting from task 1.2:
- ID1.7: Three-monthly Internal Consortium Reports (months 27, 30, 33, 36)

Resulting from task 1.3:
- ID1.8: Informal Interim Activity Report (month 30)
Objectives

1. Provide a common vision for the project goals at large and for the work in WP3-8 specifically. This is related to the fulfilment of the 7 main research objectives of the project, and the development of pedagogical models for lifelong competence development.

2. Elaborate this common vision in terms of specific functional and non-functional requirements and process definitions that are specifically dividing the work in the different Work Packages.

Description of Work

Under DIP-3 WP2 will be responsible for defining usage profiles, which will be based on the high-level use cases and descriptions provided by the WP2 Vision Group. The actual development of the usage profiles will be the responsibility of ad-hoc working groups under WP2. These usage profiles are divided into the five high priority usage profile (partly developed under DIP-2) to be implemented before May 2008 by the aspect Work Packages, and additional usage profiles to be implemented after May 2008 by the aspect Work Packages.

WP2 under DIP-2 already specified five high-priority Usage Profiles (see deliverable D2.2) that will be implemented by the aspect Work Packages before May 2008. These are:

- ‘Share knowledge in a community of practice’
- ‘Create LD course’
- ‘Follow LD course’
- ‘Create and use personal development plans’
- ‘Exploring resources, persons and competence profiles’

Under DIP-3 WP2 will be responsible for defining four more Usage Profiles:

- ‘e-Portfolio’ (to be developed during the Winterschool)
• ‘Personal Development Planning’
• ‘Competence Assessment’

WP2 will also be responsible for:
• Assessing and prioritising change requests for PCM services received from WP5-8, which will then be implemented by WP3 as well as change requests from WP4 for ensuring an early and continuous link to exploitation activities.
• Defining the functional requirements for the ‘TENCompetence portal’, integrating the various web clients.
• Design the PDP rich client tool (implementation of Usage Profile ‘Create and use personal development plans’) that will replace the planning window in the present PCM RCP.
• Providing overall guidelines for the graphical user interface of the various client implementations to secure a common look and feel between these clients.
• Functional acceptance testing of the integrated PCM.

General Task: Management, review and assessment
This covers WP management in line with the gender plan, DIP-formulation, and review and assessment of activities, internal deliverables and deliverables.

Task 2.1. Vision development
This task comprises three sub-tasks:

1-a. Provide a common vision of the project for WP3-8, directly related to solving the seven main problems identified by the project. A work group of senior researchers, the Vision Group, has been set up for this purpose. This will result in a number of functionality change requests that will be managed within task 2 and collected into an overall TENCompetence vision document (ID2.9, month 28; ID2.10 month 35; ID2.11 month 42).

1-b. Design of usage profiles and core of TENC. The Vision Group defines high-level use cases and descriptions, on the basis of which the functional usage profiles are defined by ad-hoc working groups under WP2. For ePortfolio and Competence Assessment a specification will be delivered to be implemented by WP3. Together this will result in a number of functionality change requests that will be managed within task 2 and collected into several TENCompetence vision documents: ID2.9, month 28; ID2.10 month 35; ID2.11 month 42.

1-c. Develop pedagogical models for lifelong competence development. Provide descriptions of new, promising innovative pedagogical approaches that meet the demands of lifelong competence development and new available learning technologies. During DIP-2, pedagogical requirements and an organisational model needed for their implementation have been developed that integrate individual, collaborative and organisational learning, and knowledge management, and include technological artefacts as well as support for personal competence development. During DIP-3, after each updated version of the Usage Profiles, use case models and the domain models, the organisational model and its corresponding pedagogical requirements will be mapped onto the updated domain model, USAGE PROFILES, use cases, PCM and the pilots to identify possible gaps. The results of these analysis activities, the possibly resulting changes in model, and its requirements will be collected into an overall TENCompetence pedagogical models document (part of D2.3 and D2.4). The subtask feeds into subtask 1a, thus providing an overall vision, to be elaborated and specified towards WPs 3-8 in task 2.
**Task 2.2. Operationalise the vision and models resulting from task 1 and manage system functionality**

2-a. Interface Design  
Guidelines for the graphical appearance of both the rich-client and web-client user interfaces are created in this task by professional graphical- and interface designers. These guidelines serve as a baseline for the development of user interfaces by WP3 and WP5-8.

2-b. Interaction Design  
Interaction diagrams will be generated in response to each change request received. The results from task 1-b will also be translated into interaction diagrams. These diagrams will be consolidated together with the functional specification in several internal deliverables (see below).

2-c. Functional Specification  
Work from the Vision Group and results from the pedagogical models will be translated in functionality change requests as well as other requirements coming from WP4 and the Aspect Work Packages (WP5 to WP8). WP2 will set up a procedure for the posting of such requests. The format for the request will be determined together with WP3. Received change requests are assessed and prioritised by a Change Control Board (comprising representatives from WP3 and the Vision Group, meeting regularly). Prioritised change requests are translated into functional specifications for the releases of the integrated system. The functional specifications are documented in internal deliverables for each release (ID2.13 to ID2.17) and are finally consolidated in an overall update in the form of two deliverables (D2.3 month 30; D2.4 month 42).

2-d. Design coordination  
WP2 will organise together with the WP3 ‘delivery sessions’ (see WP3 description) and WP9 (responsible for logistics) regular face-to-face and on-line meetings to exchange and discuss the results of task 2-a, 2-b and 2-c with the aspect WPs and WP3.

**Deliverables**

The deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined deliverables for DIP-3 continues from there. All deliverables aggregate underlying internal deliverables (see next section).

- D2.3: Updated Use Case models based on ID2.9 and Change Requests for Release 3.0 Release (under DIP-2 this deliverable was labelled ‘Updated functional and non-functional requirements, and process definitions’) (month 30).
- D2.4: Updated Use Case models based on ID2.11 and Change Requests for Release 6.0 (month 42).
**Internal deliverables**

The internal deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

Resulting from task 2.1:

- ID2.9: Series of documents reporting on vision sessions, linked to the seven problems addressed by TENCompetence - these may be thematic, or address the overall TENCompetence strategy: to be collected into an overall vision document (month 28)
- ID2.10: Series of documents reporting on vision sessions, linked to the seven problems addressed by TENCompetence - these may be thematic, or address the overall TENCompetence strategy: to be collected into an overall vision document (month 35)
- ID2.11: Series of documents reporting on vision sessions, linked to the seven problems addressed by TENCompetence - these may be thematic, or address the overall TENCompetence strategy: to be collected into an overall vision document (month 42)

Resulting from task 2.2:

- ID2.12: Graphical Design Guidelines (month 25)
- ID2.13: Change Requests for Release 2.0 (month 26)
- ID2.14: Change Requests for Release 3.0 (month 27)
- ID2.15: Change Requests for Release 4.0 (month 30)
- ID2.16: Change Requests for Release 5.0 (month 35)
- ID2.17: Change Requests for Release 6.0 (month 39)
# WP 3: Technical Design & Implementation of the Integrated System

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## Objectives

1. Update the architectural design and its implementation to further improve the support of agile integration of multiple clients including an improved rich client and web client.
2. Provide support for easy integration of finalised WP5-8 components.
3. Set up and maintain the infrastructure for the running pilots.
4. Develop the PDP client to replace the planning window in the present PCM.
5. Program new releases of the services for the TENCompetence integrated system and delivering these in coordination with WP4 to optimally support the pilots.

## Description of Work

The Work Package is responsible for the technical design and implementation of the Integrated System. The Work Package implements services to support the usage profiles delivered by the aspect Work Packages, provides development guidelines to the aspect Work Packages and ensures a consistent integrated system and architecture.

### General Task: Management, review and assessment

This covers WP management in line with the gender plan, DIP-formulation, and review and assessment of activities, internal deliverables and deliverables.

### Task 3.1. Update the overall TENCompetence architectural design

This updates ID3.6 (Report with the overall design of the TENCompetence architecture) with:

a) Changes necessary to fulfil the new requirements from WP2
b) Guidelines for the aspect Work Packages how they can integrate their components and/or usage profiles
c) The approach and common infrastructure guidelines for the rich web clients (applying AJAX or Flash for enhanced user interfacing).

The releases during the DIP-3 period are in month 30 (ID3.9), 35 (ID3.12), 39 (ID3.15) and 42 (ID3.18).
**Task 3.2. Provide support for loosely coupled integration of the WP5-8 components**
Further extend and improve the services hosted by the TENCompetence server, to accommodate a loose coupling with WP5-8 components and provide common user interface components (all based on WP2 change requests). The releases during the DIP-3 period are in month 30 (ID3.10), 35 (ID3.13), 39 (ID3.16) and 42 (ID3.19). These documents define and explain the public APIs to developers within and outside the core TENCompetence partners.

These releases will be discussed during ‘delivery sessions’ between WP3 and the aspect WPs, together with the design updates (Task 1) and plans for the upcoming releases (Task 4). These sessions will be organised by WP9, and together with the regular on-line meetings should secure the necessary information exchange and coordination between the work of WP3 and the aspect WPs. Preferably these sessions will be planned to coincide with the closed project meetings.

**Task 3.3. Maintain the infrastructure for running pilots in the project**
Maintains and monitors the TENCompetence infrastructure (which contains separate hosted environments for pilots, project members and public testing). This infrastructure will also host the services created by the Aspect Work Packages.

**Task 3.4. Develop PDP client**
WP3 will develop the PDP rich client tool (implementation of Usage Profile ‘Create and use personal development plans’). This rich client component will replace the planning window in the present PCM RCP. The required underlying positioning and navigation services will be delivered by WP7.

**Task 3.5. Design, implement and deliver new releases of the integrated TENCompetence system**
Time-boxed releases will take place three times per year, to ensure quick feedback on new functionality, and their release dates match the planning in WP2's released roadmap. The releases during month 25-42 are in month 27 (ID3.8), 30 (ID3.11, including the first common infrastructure for the web clients), 35 (ID3.14), 39 (ID3.17) and 42 (ID3.20). Besides these official releases, there will be regular builds to enable quick feedback from usability tests by WP2.

Releases will integrate approved WP5-8 components and/or usage profiles (e.g. a Personal Development Plan view, course authoring view, knowledge management view, etc.) and extensions / improvements of the services offered by the integrated system (these are developed in Task 2). Extensive JavaDoc will be part of each release, thus properly documenting the source code. User manuals explaining how to use the clients will be created by WP9, with help from WP3 when required.
Deliverables

The deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined deliverables for DIP-3 continues from there. All deliverables aggregate underlying internal deliverables (see next section).

- D3.3: Aggregate of internal deliverables ID3.6, ID3.8, ID3.9, and ID3.22 including updated design and second release software, month 30.
- D3.4: Aggregate of internal deliverables ID3.19, ID3.20, ID3.21, ID3.23, month 42.

The intermediate designs and releases covered by Internal Deliverables ID3.10-ID3.18 will not be aggregated into official deliverables. Instead these will be documented, and discussed during ‘delivery sessions’ with WP5-8 (under task 2).

Internal deliverables

The internal deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

Resulting from task 3.1:
- ID3.6: Version 2.0 of the overall design report of the TENCompetence architecture, according to the SOA approach, the requirements from WP2, feedback from the WP4 pilots, the service definitions for the WP3 functionality and the WP5-8 components to integrate and an updated user interaction model, month 26 (postponed from month 20 under DIP-2).
- ID3.9: Updated design for release 3.0 of the TENCompetence software, month 30.
- ID3.12: Updated design for release 4.0 of the TENCompetence software, month 35.
- ID3.15: Updated design for release 5.0 of the TENCompetence software, month 39.
- ID3.18: Updated design for release 6.0 of the TENCompetence software, month 42.

Resulting from task 3.2:
- ID3.10: Updated API definitions for release 3.0, month 30.
- ID3.13: Updated API definitions for release 4.0, month 35.
- ID3.16: Updated API definitions for release 5.0, month 39.
- ID3.19: Updated API definitions for release 6.0, month 42.

Resulting from task 3.3:
- ID3.21: Guidelines describing installation, configuration, maintenance and monitoring of the TENCompetence infrastructure, month 42.

Resulting from task 3.4:
- ID3.22: PDP client, month 30
- ID3.23: PDP client integrating WP7 positioning and navigation services, month 36
Resulting from task 3.5:
- ID3.8: Release 2.0 of the TENCompetence integrative software (carried over from DIP-2 where it was labelled ‘Second major release of the TENCompetence software, realising the software as described in version 2.0 of the overall architectural design report’), month 27.
- ID3.11: Release 3.0 of the TENCompetence integrative software, month 30.
- ID3.14: Release 4.0 of the TENCompetence integrative software, month 35.
- ID3.17: Release 5.0 of the TENCompetence integrative software, month 39.
- ID3.20: Release 6.0 of the TENCompetence integrative software, month 42.
WP4: Pilots with the integrated system and validation of the project

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* “a (+b”) mm, this means with “a” mm focusing on the validation of new functionality and “b” mm focusing on executing business demonstrator pilots.

Objectives

1. Set up, run, and evaluate cycle 2 usability pilots
2. Define, plan and execute cycle 3 business demonstrator pilots
3. Provide business demonstrator planning and implementation tools

Description of Work

Under DIP-3 the goal of this Work Package is to complete the usability pilots, and to prepare and start executing business demonstrator pilots. The usability pilots will be planned, prepared and executed as part of cycle 2, in months 25-36.

The business demonstrators aim to implement a diversified set of real-world pilots to validate the TENCompetence infrastructure in meeting the seven project objectives. These demonstrators will be planned during months 25-36, and will be executed under cycle 3, starting in month 37.

The business demonstrators will be executed through Associate Partners. For this purpose each of the eight large consortium partners will ‘adopt’ an Associate Partners, and where possible subcontract services provision within the demonstrator to SME’s. The business demonstrators should be significant in terms of implementing a combination of usage profiles (the separate usage profile implementations will be user-validated by the aspect WPs themselves) for diverse user groups (individuals, groups and organizations) and in different settings (such informal learning, work place learning, etc.). They should also be large enough to demonstrate wide-impact use of the TENCompetence infrastructure.

Special attention will be paid to close coordination with WP9 to secure relevant training for the Associate Partners involved in the demonstrators, and with WP10 to secure proper embedding of these Associate Partners in the TENCompetence organizational infrastructure.
In preparation for the business demonstrators WP4 will develop the tools required to assist Associate Partners in participating as clients and service providers in these business demonstrators.

**General task: management and review**
This task covers WP management and review of other WP deliverables.

**Task 4.1. Set up, execute and evaluate cycle 2 usability pilots** (month 25-37)
Plan the implementation of cycle 2 pilots and produce D4.3 that also contains their evaluation plans. Implement cycle 2 pilots in accordance to the plans presented in D4.3 and conduct evaluation activities and usability inspections. The outcome of these activities (ID4.9) will be recombined into a set of recommendations for the third project cycle. Such recommendations will form the core of D4.4 that will be distributed to the concerned WPs for feedback.

**Task 4.2. Define, plan, and execute cycle 3 demonstrator pilots** (month 25-42)
The main focus of this task is to define two strands of pilots for execution during cycle 3. The first category of pilots continues along the line of the cycle 1 and 2 pilots. This means they focus on the usability validation of the newly incorporated functionality. The second category of pilots are the business demonstrators to be executed by Associate Partners with support of the eight larger consortium partners. These demonstrators will be planned and prepared during months 25-36, and execution will start in month 37.

**Task 4.3. Provide cycle 2 pilot evaluation plans** (month 25-36)
Develop the evaluation plans for cycle 2 pilots and include them in D4.3. Adapt or develop scientific evaluation methodologies and the measurement instruments that describe the targeted factors to be measured in each pilot starting in cycle 2 (ID4.6).

**Task 4.4. Develop demonstrator implementation tools** (month 25-36)
These tools will partly be based on experiences with the cycle-2 pilots (D4.1, D4.2, D4.3, D4.4) but because the demonstrators will be executed by Associate Partners and their purpose is quite different from the cycle-2 pilots, additional tools will be developed. These include, but are not limited to, installation guides, user guides, and task and procedure descriptions (D4.5). Provide ID4.11 by month 30 to be used by continuing pilots from cycle 1.

**Deliverables**
The deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined deliverables for DIP-3 continues from there. All deliverables aggregate underlying internal deliverables (see next section).

- D4.3: Report containing internal deliverable outcomes ID4.3, ID4.6, ID4.8 and ID4.11, month 31
- D4.4: Report on the results of the evaluation of the cycle 2 pilots, month 36
- D4.5: Cycle-3 demonstrators development and implementation tool set, month 36
### Internal deliverables

The internal deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

Resulting from task 4.1:
- ID4.3: Execution and evaluation plan for cycle 2 pilots, month 26 (carried over from DIP-2)
- ID4.8: Finalize distribution of cycle 2 pilots information, month 30 (carried over from DIP-2)
- ID4.9: Evaluation outcomes of cycle 2 pilots of the integrated system, month 36

Resulting from task 4.2:
- ID4.10: Execution and Evaluation Plans for cycle 3 pilots, month 36

Resulting from task 4.3:
- ID4.6: Evaluation implementation plans for pilots starting in cycle 2, month 30

Resulting from task 4.4:
- ID4.11: Pilot implementation methodology, month 30
### WP 5: Knowledge Resources Sharing and Management

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#### Objectives

1. Identify and select core/additional functionalities for supporting knowledge sharing activities
2. Define the specific activities to support in a knowledge sharing scenario
3. Design the interaction models for an aggregation web tool
4. Develop a web tool supporting core/additional functionalities for knowledge sharing in communities

#### Description of work

WP5 aims at stimulating knowledge sharing, knowledge management and the conversion of information into knowledge in communities of practices. Building on the work carried out over the first two years, with a stronger orientation on repurposing available web2.0 tools (see the year-2 Activity Report), the following core services will be integrated and where necessary developed: discovery, aggregation of resources, recommendation, categorising and tagging, setting up discussions, download and upload resources. Towards the implementation of these services we will focus on two main issues: managing the identity of users and conceiving grouping strategies.

Work in the first 6 months will devise scenarios to trigger and support user participation in knowledge sharing (Task 5.1). In parallel an extensive benchmarking will select the most appropriate services available (Task 5.2). Also a metadata repository to link the various resources/learning activities/units of learning will be developed, to be used by all usage profiles (Task 5.5). Tasks 5.1 and 5.2 will converge towards the development of a web-based tool called LearnWeb2.0 (the new KRSM) - offering various knowledge sharing services through the aggregation of different services (Task 5.3). Work in the rest of the period will improve/elaborate the Web Tool with additional services; with eventual suitable services provided in WP3; with development of the social help system scenario in collaboration with WP8; with the study of the personalisation issue, according to the users’ profiles. In all the phases of the work usability tests will be conducted (Task 5.4).
**General task: management and review**
This task covers WP management and review of other WP deliverables.

**Task 5.1 Interaction models and new discovery/sharing scenarios**
This task's aim is twofold: devising scenarios for triggering and supporting knowledge sharing in communities of practices and modeling their interactions (people-resources-people). Scenarios will describe the features of the services giving the savor of how they could be implemented to support people's activities. Interaction models will depict the relations among users and resources aiming at supporting sharing activities. The final aim will be to trigger and support user participation in knowledge sharing, such as rating and commenting quality, usefulness and relation to competence level, allowing users to group resources, topics and topic areas as well as setting up discussions around resources/topics. As a result, T5.1 will define the requirements and the features to be implemented (ID5.12) in T5.3 for Knowledge Sharing. Inputs for these requirements definition phases will derive also from WP2 interaction design process and the related WP3 feedback.

**Task 5.2 Design the Knowledge Sharing web tool**
This task focuses on the design of a glove to connect different services and functionalities in a web client. These services will exploit the modeled interactions and support the usage scenarios specified in T5.1.
In parallel with task 5.1, a first part of the task will consist of collecting usable services already existing, responding to, and mutually informing, the requirements evolving from task 5.1.
This task will avoid a mere listing of tools, inventorying, instead, those more suitable for the core objectives of the WP5 according to the selection criteria identified in the scenarios (T5.1). For that, this task will provide a scalable list of features/activities/users to support in the Web Tool. According to these requirements, the most suitable functionalities coming from open source services will be presented and prioritised (ID5.14).
Subsequently, this task will focus on defining the specific usage scenarios and, for each of them, designing and combining the identified services.
The set of services that will be aggregated has been divided into core services (first six months of DIP-3) and additional services (last six months of DIP-3). Core services that we want to integrate include discovery and recommendation of resources (based on ratings and comments of quality, usefulness and/or difficulty), aggregation (based on groups of resources, topics or topic areas), collaborative creation/modification of resources (e.g., via wikis or google docs) set of discussions around resources or topics as well as download and upload resources from/to Internet. Additional services will be identified, selected and prioritised following the same approach as the core services (ID5.13 and ID5.15). They could include categorisation and tagging by users, summarization of discussions (possibly as a collaborative document), automatic metadata extraction of known file types, browsing of resources, user profiles and associated relations, and indexing. Moreover the second period will be devoted to the development of the social help system usage profile in collaboration with WP8.

**Task 5.3 Develop the Knowledge Sharing Web Tool**
In this task, the two tasks described before will converge towards the aggregation of the services (T5.2) into a compelling web client (the LearnWeb2.0 Tool) supporting knowledge sharing scenarios (T5.1). Work in the first 6 months will focus on the aggregation of the identified core tools into a Web Tool. The remaining time will be used to improve the tool.
with: a) the additional services from T5.2 review; b) design concepts coming from T5.1; and c) experience gathered in designing the LearnWeb2.0 defined in DIP-2. This task will be conducted in close collaboration with WP3.

**Task 5.4 Evaluation of the models of interaction and tool’s usability**

This task aims at providing an iterative evaluation of the resulting interaction models, services and the Web Tool developed in T5.1, T5.2 and T5.3 respectively. The "conceptual evaluation" will focus on the validation of the consistency of the interaction models defined with respect to the features/activities/users supported by the services and tools to be developed (results of this evaluation will be added to ID5.12 and ID5.15). The usability of the tools and services will be tested during each design phase. The results will be presented in ID5.10 and ID5.17 to feed the next design phase. The Evaluation Plan will be continuously updated in order to provide the related evaluation reports.

**Task 5.5 Develop a metadata editor and repository**

The various usage profiles need a metadata editor for resources, competences, competence profiles etc. WP5 will first deliver a metadata repository service (ID5.18) which the aspect Work Packages will be able to include in their May-2008 releases. After its completion, the metadata repository service will be added to the list of PCM services. Next, this will be turned into a full metadata editing service (ID5.19). After its completion, the metadata repository service will be added to the list of PCM services.

**Deliverables**

The deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined deliverables for DIP-3 continues from there. All deliverables aggregate underlying internal deliverables (see next section).

- D5.2: LearnWeb2.0 system evaluation results, month 34
  Aggregates internal deliverables ID5.7, ID5.10, ID5.11, ID5.12, ID5.14, ID5.18
- D5.3: LearnWeb2.0 results, month 42
  Aggregates internal deliverables ID5.13, ID5.15, ID5.16, ID5.17

**Internal deliverables**

The internal deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

Resulting from task 5.1:

- ID5.12 Interaction models and requirements for a knowledge sharing scenario (month 26)
- ID5.11: Updated roadmap as outcome of task 1 running till month 30 (month 30)
- ID5.13 New interaction models and requirements for a knowledge sharing scenario v2 (month 36)
Resulting from task 5.2:
- ID5.14 Core services requirements v1 (month 29)
- ID5.15 Core- and additional services requirements v2 (month 38)

Resulting from task 5.3:
- ID5.7: LearnWeb2.0 tool v1 (formerly: KRSM web tool - final release, comprising integrated component/services implementation ready for delivery to WP3) (month 30)
- ID5.16: Elaborated version of the LearnWeb2.0 tool v2 (month 40)

Resulting from task 5.4:
- ID5.10: LearnWeb2.0 second cycle evaluation outcomes (month 32)
- ID5.17: LearnWeb2.0 tool final evaluation outcomes (month 42)

Resulting from task 5.5:
- ID5.18: Metadata editor and repository service (month 30)
### WP 6: Learning Activities & Units of Learning

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### Objectives

1. Develop a useable integrated tool for teachers and learners, enabling them to design learning and assessment activities, and evaluate its effectiveness.
2. Develop a useable and effective tool for learning designers enabling them to edit IMS Units of Learning, and evaluate its effectiveness.
3. Develop, deploy, and deliver to learning providers, an integrated and usable system capable of running IMS LD with a rich set of services.

### Description of work

WP6 contributes to the objective of researching and developing innovative, standards-based methods and tools for the creation, storage, use and exchange of formal and informal learning activities and units of learning, including tools for the assessment of the learning process and learning outcomes.

The work in the Work Package is articulated as follows:

- The usage views addressed in this Work Package are:
  - create course (pre-authoring & authoring)
  - follow course
  - competence assessment.
- The outputs of the Work Package are divided into:
  - **Core functionality.** This is an integrated system enabling teachers to create, publish and populate courses. The authoring components are Rich Client Platform (RCP), and the end user runtime systems are web based. The services used are those available in (a) the PCM at month 24; (b) SleD (c) the TENCompetence Widget server v.1. The integrated system will be submitted as part of D6.2 in month 30. The core functionality will be submitted as D6.2 in month 30.
  - **Extended functionality.** This is an integrated system which provides (a) extended support for pre-authoring (pedagogic activities and competence assessment); b) advanced IMS LD authoring. Extended functionality will be submitted as D6.3 in month 42. The services used will include all those used in core functionality, plus any additional services which may be required.
This work will build on project outcomes from earlier phases, specifically a) the Assessment Specification; (b) the first release of the graphical LD Author (c) the connection protocol and Widget based runtime system. These components will be extended, refined, tested and evaluated so as to will constitute an interoperable suite of tools for authoring and delivering learning and assessment activities, and with associated exemplars.

**General task: management and review**
This task covers WP management and review of other WP-deliverables.

**Task 6.1: Pre-authoring**
Authoring Units of Learning and Assessment using IMS LD and QTI is too complex to be carried out directly by most teachers. The Pre-authoring tools provide these users with support in the creation of pedagogically sound, powerful learning designs and assessments. The tasks to be undertaken are:

a) definition of specific pedagogical and assessment models to be supported by the pre-authoring component.

b) development of a web based tool to facilitate the creation of courses by providing guidance and support in the form of educational scenario based on models, metaphors and constructs.

c) development of a Rich Client Plug-in tool to facilitate the modelling of integrated learning and assessment processes based TENCompetence Assessment Process Specification.

d) design and implementation of algorithms to transform human-understandable pedagogical and assessment models into executable units of learning and assessment represented in IMS LD and IMS QTI.

e) evaluation of the Pre-authoring tools.

f) revision of the TENCompetence Assessment Process Specification and Pre-authoring components to result in a production quality system with additional pedagogical and assessment models.

Pre-authoring is extended functionality. A first version of both the course pre-authoring component (web based) and the assessment pre-authoring component (RCP based) will be delivered in month 36 as component of ID6.6. The main delivery of the Pre-authoring functionality will be in month 42 as part of D6.7, with full and evaluated functionality for Create Course, run course, and competence assessment.

**Task 6.2: Authoring**
The Pre-authoring component will generate documents conformant to IMS LD and QTI. The Authoring component will be able to edit these documents at the level of the specifications. The scope of the component is a) the whole of IMS LD, b) a subset of IMS QTI. It is not necessary to implement the whole of IMS QTI because some of its functionality is also available in IMS LD level A. The subtasks are as follows:

a) Develop an Eclipse RCP application with a graphical environment which provides a visual authoring environment for IMS LD (levels a, b & c) which makes the conceptual structure of the specification as easy to use as possible.

b) Develop a RCP supporting a subset of QTI 2.0 functionality and integration with the graphical LD authoring tool.

c) Link the authoring component to the runtime widget server, to support definition of services to be used at runtime.

d) Provide an easy mechanism for publishing and populating runs of UOLs.
e) Link the authoring component to the PCM to enable authors to identify learning resources for use in UOLs, and to identify the competence development objectives which are associated with them.

f) Evaluation of the authoring component.
The core functionality provided in Authoring consists of the visual LD Author (level A), with integrated publishing, UOL population, and runtime delivery. This will be delivered in month 30.

Extended functionality will comprise visual editing of IMS LD Level B&C (including properties and conditions), and handling of IMS LD fragments and templates, and integration with the PCM at the level of competence development objectives. Evaluated extended functionality will be submitted in month 42 as part of D6.3.

**Task 6.3: Runtime**

Task 6.3.1 Widget server. A key problem in the implementation of IMS LD which has so far resisted resolution is the provision of a rich set of services at runtime. The TENCompetence connection protocol was submitted in D 6.1 and provides a solution to this. A proof of concept runtime system developed to implement this protocol was delivered at the start of the period covered by this workplan, and the main focus of work in this task will be to develop and extended this system, and to ensure smooth interoperability with the Pre-authoring and Authoring Components. This will involve:

- a) provision of a production quality runtime service
- b) investigation through trials of the potential of the widget server for hosting scriptable, configurable collaborative environments
- c) inclusion of additional services, both in response to requests from users, and leveraging existing widgets which can be adapted
- d) refine the connection protocol

Task 6.3.2 Runtime integration and maintenance. This task will

- a) improve the integration of runtime systems, including with Learn eXact. This will be extended to provide ease of use of runtime systems for authors and learners, in particular in the provisioning and running of UOLs.
- b) maintaining, integrating, and where appropriate extending or replacing the code of the servers and applications required for running learning activities. The applications concerned are:
  - CopperCore
  - SleD
  - Clicc
  - APIS
- c) Evaluation of the integrated WP 6 system

Core functionality in runtime consists of integration of the Widget server with SleD, and will be submitted in month 30.

Extended functionality will revise the server components mentioned in T6.3.1 and T6.3.2, and extend them as required to ensure effective runtime support for the evolving learning and assessment activities.

**Deliverables**

The deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined deliverables for DIP-3 continues from there. All deliverables aggregate underlying internal deliverables (see

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**Note:** The text continues with further details on the deliverables for each task, including specific requirements and timelines for submission. However, due to the length, the full details are not included here. The deliverables are systematically detailed to ensure comprehensive coverage of all aspects of the workplan.

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next section).

- D 6.2: Compilation of internal deliverable outcomes ID6.4-ID6.5 (month 30)
- D 6.3: Compilation of internal deliverable outcomes ID6.6 - 6.12 (month 42)

### Internal deliverables

The internal deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

**Carried over from DIP2:**
- ID6.4 Integrated Core LD Authoring System (month 30)
- ID6.5 Validation Testing and Usability Evaluation Results (month 30)

**Resulting from task 6.1:**
- ID6.6: Learning activity and assessment pre-authoring tools – 1st Release (month 36)
  - including the following items
    - A web-based system for creating and running learning activities, drawing on services provided by the PCM
    - A component for pre-authoring units of assessment, generating IMS LD and QTI, and built on the ReCourse editor
- ID6.7: Evaluation report on usability and effectiveness of the pre-authoring tools (month 42)

**Resulting from task 6.2:**
- ID6.8 Learning activity authoring tools – 3rd release (ReCourse v.2.0) (month 36), consisting of:
  - support for IMS LD level B
  - support for level C
  - handling of IMS LD fragments and templates
  - integration with the PCM at the level of competence development objectives
- ID6.9 Evaluation report on usability and effectiveness of authoring tools (month 42)

**Resulting from task 6.3:**
- ID6.10: Widget server 2nd release (month 36), consisting of
  - Widget server and related infrastructure, production system
  - Revised version of the connection protocol
- ID6.11: Integrated runtime system, 3rd release (month 36) consisting of
  - Report on integration of the runtime system, including maintenance, bug fixes and extensions implemented
  - Manual for installation and maintenance of the integrated runtime system
- ID6.12: Evaluation report on usability and effectiveness of runtime environment (month 42)
### WP 7: Competence Development Programs

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### Objectives

1. Implementing and orchestrating four complementary personalization services for creating Personal Development Plans: navigation, positioning, curriculum planning, preference-based mechanisms
2. Continue work on the learning path description, to be brought to the attention of relevant standards bodies with the help of WP10
3. Creating and evaluating a graphical PDP planning tool
4. Conceptualizing and implementing tools for matching competences with job profiles for creating personal development plans

### Description of Work

The main focus of WP7 is to provide teachers, authors and learners alike with powerful tools for creating, managing and using their personal development plans (PDPs). These PDPs may be authored to be followed by a larger audience, or created to fit the particular needs of an individual user. Before May 2008 WP7 will concentrate on implementing the services for the usage profile ‘Create and use personal development plans’ and the graphical PDP planning tool. The rich client component will be developed first to replace the planning window in the present PCM RCP, and next work will concentrate on the web client.

After May work will concentrate on the elaboration of the ‘Create and use personal development plans’ implementations, and implement the usage profile ‘Matching personal competences on job profiles to create personal development plans’.

### General task: management and review

This task covers WP management and review of other WP deliverables.

### Task 7.1: Implement PDP Navigation & Positioning Services

In the first two cycles, the personalisation services included an LSA-based positioning service (selection of the relevant learning activities) and a navigation service (structuring of the selected learning activities) that makes use of collaborative filtering techniques. In
addition, a preference-based personalisation service that makes use of a preference-based selection algorithm has been created and tested. A fourth service allowing for curriculum assembling following an AI-planning approach has been developed successfully. We will further explore the requirements and benefits of personalisation that is based on competence matching by means of a prototype. At the end of the cycle, we will provide a single personalization service being an orchestration of the four validated personalisation services. This integrated service will provide the graphical client with appropriate personalized views on the repository of learning activities and will be available as a Web service used by the graphical planning tool. The graphical planning tool will build upon the state-of-the-art of graphical user interfaces, (adaptive) educational systems and learning management systems; it will make use of proven metaphors for representation of learning activities; it will provide personalized/tailored views, making use of the personalisation services developed in task 3.

**Task 7.2: Design the Competence Matching Usage Profile**

The objective of this task is to conceptualize how lifelong learners match their personal competences on job profiles; the gap between an aspired job profile and the current competences serves as the learner’s goal in creating personal development plans. Learner should be able to obtain insight in which:

- jobs that are below his current competence level
- jobs that fit his current competence level
- jobs that are fit, given some additional courses/learning activities
- jobs that are reachable after having followed an intensive program

From the perspective of a human resource manager, the following questions are relevant:

- Match current personnel and/or applicants with a certain job profile
- Given a set of competences needed in a team, which persons would be the best match for composing this team

This usage profile will serve as the basis for the implementation work done in task 3.

**Task 7.3: Implement the Matching Usage Profile**

For the competence matching, we will make use of bottom-up and top-down mechanisms, similar to the personalization services, that look for an optimal solution. Reasoning mechanisms, based on the PCM Competence Model will be developed. Outcomes of the gap analysis will be graphically displayed as recommendations in the graphical planning tool. A prerequisite for competence gap matching is that learners can edit their personal competence profiles and that organizations can edit job competence profiles in a standardized manner. These editors will also be developed in the context of this task.

**Deliverables**

All deliverables aggregate underlying internal deliverables (see next section).

- D7.2: Compilation of internal deliverable outcomes ID7.3-ID7.10. Month 30.
- D7.3: Compilation of materials on learning path description and tools for graphical planning; competence and job profile editing; and for matching competences on job profiles. Aggregates internal deliverables ID7.11 till ID7.16. Month 42.
Internal deliverables

All internal deliverables aggregate into deliverables (see section above).

Resulting from task 7.1:
- ID7.7: Prototypical graphical planning tool to be integrated into the PDP usage profile implementation developed by WP3, month 28
- ID7.10: Personalization pipeline, combining the navigation and positioning services, algorithmic curriculum planning and preference-based mechanisms, month 30
- ID7.11: Completed user study and report on the graphical planning tool, month 36
- ID7.12: Revised version of the learning path description and validation plan, month 36
- ID7.13: Validation of learning path description, month 42

Resulting from task 7.2:
- ID 7.8: Usage Profile ‘Matching Competences on Job Profiles for Personal Development Plans, month 28

Resulting from task 7.3:
- ID7.14: Editors for competence and job profiles, month 36
- ID7.15: Orchestration of services for competence gap matching, month 36
- ID7.16: Competence gap matching interface, making use of the services implemented or adapted in ID7.15, month 42
Objectives

1. Develop, test and integrate Rich Competence Profiles with the Overview Tool to enrich the users’ experience by providing data models which will allow more relevant matches between users to be made.

2. Enhance the TENCompetence clients and services with a tool integrating social network based concepts to provide an integral overview of Competence Development Opportunities available to users.

3. Develop, test and integrate value-added components such as connection agents, simulation and game dynamics embedded in on line competence development contexts.

4. Develop, test and integrate network models and management policies that support the community’s capacity for self-organisation while preserving the autonomy of individual users.

5. Deliver all the components and services developed, integrated and tested in WP8 to the TENCompetence infrastructure.

Description of Work

The core of WP8 objectives is the Overview Tool which represents the Rich Client Platform (RCP) that will be delivered to the TENCompetence infrastructure and integrated with the PCM. The Overview Tool which has been designated as the core tool of WP8 is composed of data models and rules and policies (i.e. Rich Competence Profiles, Network Management Models) and set of components (i.e. Network Visualisation and Navigation Services, Connection Agents and Game Dynamics). Activities will be organized around four distinctive but interrelated phases namely i) Design, ii) Build, iii) Integrate and iv) Deliver and the related work structured around iterative cycles whose ends coincide with the following release dates of the PCM: Months 30, 35 and 42 to ensure constant deliveries and smooth integrations with the PCM.

Till May 2008 the usage profile ‘Exploring resources, persons and competence profiles’ (the ‘Overview tool’ under DIP-2, comprising rich competence descriptions; network
visualisation and navigation; and network management) will be integrated as rich client components in the PCM first, and as web clients next. After May 2008 efforts will concentrate on including connection agents and game dynamics in the ‘Exploring resources, persons and competence profiles’ implementation, and on implementing the ‘Social help’ usage profile. One of the main emphasis points will be to resolve the present data model discrepancies between the Overview Tool and the PCM v1.0.duplications with the PCM v1.0.

The corresponding tasks are described below:

**General Task**
This task covers WP management in line with DIP3 and review and assessment of activities, internal deliverables and deliverables.

**Task 8.1: Design and Integrate the Conceptual Data Models**

**Task 8.1.1: Design and integrate the rich competence profiles with the Overview Tool**

This subtask aims at producing “competence profiles”, being aggregations of single contextualized competencies. For the context we are using semantic models to which single abstract competencies can refer in order to become specific and meaningful. The Competence Management Framework (CMF) will use i) a competence domain ontology, ii) a competence content ontology and iii) a context ontology as described below:

*Competence Domain ontology:* The data model of the CMF itself, currently expressed in UML, is conceptualised into a competence ontology. This allows (standard) XML specifications, logical database schemas and competence related applications to ‘ontologically commit’ to the competence domain ontology, hence creating a semantic interoperability wherever possible.

*Competence Content ontology:* Specific competencies belonging to a coherent model can be modeled using semantic annotation of their free text descriptions. In that sense legacy competency databases can be compared and aligned with the competency content ontology. We will research how far different HR applications can then meaningfully interchange competency related data by interchanging their respective ontological commitments.

*Context ontology:* A contextualized competency is a context specific interpretation of a competence. Here the free text field to describe a competency context (as found in the HR-XML competency specification, not in the IEEE RCD spec), is replaced with the RefID (read: ontological commitment) to a genuine context ontology. These context ontologies can be simple or complex according to the needs of the applications making use of them. We also allow the inclusion of semantic relations between competences (contextualized competencies) thus generating a ‘competence profile’ (CP). Such CP then can be attached to an artefact being a person, job, task, learning material, process, etc…thus resulting in PCP, JCP, LMCP etc. which finally can be matched against each other.

**Task 8.1.2: Design and integrate the Network Management Models with the Overview Tool**

This subtask provides detailed specifications and implementing models that help to understand and manage the dynamic behavior of networked communities. In the first phase of the project we have developed and tested the device of ad hoc transient communities, focusing on mutual, peer-to-peer support of learning network users. In this phase we investigate the use of ad hoc transient communities as a generic device to increase the
connectivity of members of networked communities. To that end this subtask will describe and develop an appropriate community model to connect users in their request for support, test and validate the model, provide the requirements for the implementation of this component, and integrate this component with the Overview Tool.

**Task 8.2: Develop the Overview Tool and components**

**Task 8.2.1: Elaborate Usage Profiles**
This subtask aims at elaborating the two usage profiles and their respective high level cases to be implemented in the PCM. First, the ‘overview’ usage profile (exploring resources, persons and competence profiles) will be developed and implemented before month 30 (providing that the required minimum services are available in the PCM) Second, the ‘social help’ usage profile will be elaborated and implemented after month 30 in coordination with WP2.

**Task 8.2.2: Develop Functional and Technical Specifications**
This subtask aims at developing the functional and technical specifications for developing the Overview Tool and the components prototypes namely i) the network visualisation and navigation services, ii) the connection agents and iii) the connection game-dynamics. These specifications contain the high-level functional requirements as well as the configuration and coding description for implementation of the different releases of the Overview Tool.

**Task 8.2.3: Build the Overview Tool and the components prototypes**
This subtask aims at developing the components prototypes to be further integrated with the Overview Tool which are i) the network visualisation and navigation services, ii) the connection agents and iii) the connection game-dynamics. Network visualisation and navigation services provide means to browse and filter the network, making the most use not only of one’s network, but also of the networks of each member of one’s network. Stimulus agents are responsible for suggesting connections between users and/or knowledge assets and competence development opportunities. Finally, game dynamics contribute to the development of rich exchanges within and across community members via learning-by-doing experiences. We are developing the prototypes to validate these components and assess their suitability to extend current competence development systems and learning networks.

We are also addressing some specific and relevant research questions:

1. Enabling users to switch from “linear” to “network”-based models, through the deployment of visualisations of dense social and knowledge networks representing relationships between people and different types of knowledge assets (competences, learning objects, competence development programmes, CDOs, etc.) has a very high potential value. Nevertheless it requires that we address and resolve a number of representation- (visualisation and aggregation) and complexity-related challenges. We will explore these further to see to what extent they can be injected effectively as value-adding visualisation and navigation services in the PCM.

2. Connection Agents operating dynamically and proactively with the community of users and contributing to suggest and create value-adding connections among users and between users and relevant knowledge assets and community activities, are a second high impact domain we have identified. Nevertheless the mechanisms regulating the intervention dynamics of such agents throughout the Competence Development
Lifecycle, and how such agents can gradually develop a trust-based relationship with users (agent acceptance challenge) needs to be explored further.

3. The design of engaging game-based dynamics as a way of strengthening and extending the social networks is the third promising research area we have identified. First, the games we are currently designing and developing will need to be validated and fine-tuned in order to guarantee i) their acceptance by users, and ii) the effective value created through the involvement of games at the individual, group and user community levels. Second we need to explore in detail the interplay between games and agents intervening before (players selection), during (involvement stimulus), and after (reflection/game experience debriefing stimulus) the competence-related connection games selected for integration with the PCM in the TENCompetence infrastructure.

Additionally, in parallel to the development of the Overview tool and its components, specific activities will be dedicated to the harmonisation of i) the user interface to get a common look and feel between WP5, 6 7 and 8 and ii) the services developed in the different WPs upon which components are (partly) built.

**Task 8.2.4: Conduct the Overview Tool and components prototypes Unit Tests**

This subtask aims at debugging the Overview Tool and the components prototypes in the development environment by executing the unit test cases until all the acceptance criteria for each of the developed components namely i) the network visualisation and navigation services, ii) the connection agents and iii) the connection game-dynamics are met.

**Task 8.3: Integrate the Overview Tool and components**

**Task 8.3.1: Integrate the components prototypes with the Overview Tool**

This subtask aims at integrating the developed and tested components prototypes with the Overview Tool to validate the functional and technological assumptions for Competence Development Opportunities and to refine and modify them before the integration with the PCM in the TENCompetence infrastructure.

**Task 8.3.2: Design and document the Application Programming Interface (API)**

This subtask aims at specifying the Overview Tool API and its set of functions, procedures, variables, data structures, etc to be used to integrate with the PCM and writing the Overview Tool API Operational Documentation.

**Task 8.3.3: Conduct the Overview Tool and components prototypes Integration Tests**

This subtask aims at conducting testing to ensure that the components prototypes successfully perform all of the functional and technical functions required of them by the Overview Tool and that all the processes and underlying data models (i.e. Rich Competence Profiles, Network Management models) are properly integrated.

**Task 8.4: Deliver the Overview Tool and components**

**Task 8.4.1: Conduct the Overview Tool and components User Acceptance Tests**

This subtask aims at conducting a comprehensive series of acceptance test cases with end users to verify that all the requirements have been correctly implemented with the Overview Tool and its components to identify and address any defects before they are delivered to the PCM and integrated in the TENCompetence infrastructure.
### Deliverables

The deliverables defined in DIP-2 after month 24 are duplicated below. Numbering of the additionally defined deliverables for DIP-3 continues from there. All Deliverables aggregate underlying Internal Deliverables (see next section).

- **D8.3**: Report with overall WP8 results during months 31-42. Aggregates Internal Deliverables ID8.15, ID8.16, ID8.17. Month 42.

### Internal deliverables

The internal deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering (A.C) and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

Carried over from DIP2:
- ID8.6: Validated release, based on functional testing and usability evaluation results for TENCompetence Competence Observatory Prototype, month 30.
- ID8.10: Overview Tool, proactive sharing agent and game-like embedded dynamics releases tested and delivered, month 30.
- ID8.14: Validated release, based on functional testing and usability evaluation results for TENCompetence Network Management Tool, month 30.

Resulting from task 8.1:
- ID8.15: Rich Competence Profiles Data Model built, integrated and delivered, months 30, 35, 42.
- ID8.16: Network Management Model designed, integrated and delivered, months 30, 35, 42.
Resulting from tasks 8.2, 8.3 and 8.4:

- ID8.17: Overview Tool, Network Visualisation and Navigation Services, Connection Agents and Game Dynamics (latter components as part of the Social Help usage profile) built, integrated and delivered, months 30, 35, 42.
### WP 9: Training

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#### Objectives:

1. Maintaining the TENCompetence Network for PhD students to support research exchange in the academic community.
2. Supporting internal competence development to create a shared and full understanding of the TENCompetence infrastructure by partners.
3. Extend the TENCompetence training network to Associate Partners, in particular SMEs, to stimulate exchange of experience between the academic and business partners, to prepare the future TENCompetence organisational infrastructure (the Foundation).
4. To use the experience gathered through training events with real world end users to feedback and inform future improvements of both TENCompetence tools and concepts.
5. Prepare for exploitation, e.g. training packs, support services, etc.
6. Continuous training within the partnership and between Work Packages to support more efficient and up-to-date development and roll-out of services.
7. Support WP10 in dissemination activities that include a training component.

#### Description of Work

In DIP-3 special attention will be given to migrating from internal to external competence training. As more and more services and functionality become available, a staged training service will be realised with special consideration of the different target roles, stakeholder groups, and personal circumstances. Generalised abstractions of the experiences from the user pilots will be collected and analysed for broader exploitation beyond the consortium and project period.

#### General task: management and review

This task covers WP management and review of WP deliverables, DIP-formulation, and review and assessment of activities, internal deliverables and deliverables.

#### Task 9.1. PhD Network

*Maintain the TENCompetence Network for PhD Students* in line with the research activities carried out in the Aspect RTD Work Packages. A spectrum of online, face to face, and blended learning opportunities will be provided. During the period covered by DIP-3, two
more Winter School events will be held (internal deliverable ID9.10 & ID9.12) following on from ID9.3 in DIP-2.

**Task 9.2. Internal Competence Training and Knowledge Exchange Needs**
Define and organize Training for Consortium and Associate Partners (especially SMEs in their potential role as service providers) to promote efficient collaboration, development, and use of the project outcomes. Provide induction for new project members.

Special emphasis in this project period will be put on the externalisation of training to real world end users. In task 9.2 the focus here will rest on supporting the individual learner and learner groups. To this end a series of short user guides, manuals and other training materials will be developed. Together with WP4 the training needs for the Cycle 2 User Pilots (ID9.11) will be analysed and addressed. Results from training experiences will be fed back to the Aspect WPs via the TENCompetence collaborative infrastructure (online and offline).

To secure knowledge exchange in support of coordinating the cycle of functional design (WP2), technical client design resulting in services requirements (WP5-8), services implementation (WP3 for shared services), client implementation (WP5-8), and integration (WP3) meetings will be organised by WP9 between the designers and developers working in these Work Packages on a demand-driven basis. During these ‘delivery meetings’ the WP2 specifications, the new WP3 PCM services, and the upcoming releases will be worked on. Preferably these sessions will be planned to coincide with the closed project meetings but if necessary they will be organised separately.

**Task 9.3. Associate Partner Network**
Maintain the TENCompetence Network for Associate Partners, in particular SMEs, to spread the research results of the consortium as well as to getting feedback and understand the issues surrounding the implementation of the project results. Special attention in DIP-3 will be put on reaching professional networks, associations, chambers, NGOs, enterprise companies and similar multiplier organisations within the Associate Partner Network. An overview of the activities and their results will be supplied each year (ID9.15).

Organisational and personal participation will partly be captured through the TENCompetence tooling.

**Task 9.4. Service Provider Network**
Create a strategic vision for a network of Service Providers, such as career, job and HR services, and develop a training package for use cases within an organisational and personnel environment focussing on a train-the-trainers perspective (ID9.16). Following the identification of a number of key usage profiles, a framework for training and supporting future coding and user communities will be developed (ID9.17).

**Deliverables**

The deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined deliverables for DIP-3 continues from there. All deliverables aggregate underlying internal deliverables (see next section).

- D9.2: Report, containing internal deliverables outcomes ID9.2-ID9.11, month 30

**Internal deliverables**

The internal deliverables defined in DIP-2 for months 25-30 are repeated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

Resulting from task 9.1:

Resulting from task 9.2:
- ID9.11: Report on Training for Cycle 2 Pilots, month 30
- ID9.13: Induction programme for new project members, month 36
- ID9.14: Project Weblog, month 32

Resulting from task 9.3:
- ID9.15: Report on Competence Network of Associate Partners, month 36

Resulting from task 9.4:
- ID9.17: Usage case training framework - Report, month 33
**Objectives**

1. To disseminate, on an on-going basis, the RTD outcomes: specifications and standards, architectures, components and technical manuals which are developed by the project, to ensure general awareness and to create a body of interested and involved parties.
2. To support internal dissemination between project partners and associates.
3. To promote standardisation of project outcomes.
4. To promote the TENCompetence Foundation and assist (associate) partners in implementing viable business models around the solutions developed by the TENCompetence project.

**Description of Work**

The core activity of WP10 is to ensure that awareness of the TENCompetence project and its outcomes is as high as possible among identified stakeholders worldwide. The project vision will be presented on the basis of the work carried out by WP2 and other working groups, and related to the seven key problems addressed by the project. This process will be guided by the media matrix established in year 1, and to be updated as necessary at each planning stage. Access to the resources and infrastructure developed by the project is provided, together with the resources and forums they need in order to use them. This activity creates a body of interested parties who can then opt to become Subscribers and Associate Partners of the project. Activities with stakeholders fall within the scope of WP10 up to and including the time when they register as Associate Partners and up to the level of dissemination. Management of contacts between Associate Partners and project partners is through an appointed project participant in the Associate Partners home country, in a process managed by WP10. Training for Associate Partners is structured and supported by WP9. Work on business models and use of the system will be continued, building on those identified in ID10.2.

The public website and internal collaboration site established under DIP-1 will be reviewed and revised as the achievements of the project become available. Support will be provided for the standardisation of project outcomes, and the practical interoperability of the solutions.
developed.

**General task: management and review**
This task covers WP management and review of other WP deliverables.

**Task 10.1. Awareness and availability of project outcomes**
This task takes care that all project outcomes become publicly available (specifications and standards, architectures, software components, reports and manuals; connected to the right licenses) by among others using project web sites, DSpace, and Open Source channels. It includes creating news items and professional publications on project events and outputs, and additional web support where necessary to help promote outcomes e.g. creation and maintenance of mini sites to accompany major releases. Production of promotional materials such as flyers and posters also form part of this task as do press releases, interviews, FAQs and briefings.

**Task 10.2. Organising workshops and events**
Workshops and events will be organised for the wider public, as contrasted with events and workshops organised by WP9 for TENCompetence (associate) partners. Work will be conducted with Associate Partners who have volunteered to help disseminate TENCompetence outcomes to host their own events. Relevant events which have not been organised by TENCompetence will be targeted for possible TENCompetence presentations and flyers will be distributed where appropriate. Current core partners will be approached for news of non-scientific events which could benefit the dissemination effort.

**Task 10.3. Pro-active internal dissemination**
This covers all activities to inform all (associate) partners on progress between and over individual WPs including the use of a central blog system defined by WP. It is anticipated that the blog can be harvested on a weekly basis to provide content for up-to-date newsletters for subsequent dissemination. This work is also expected to provide WP9 with information that can be used for the training of newcomers to the project. Regular postings on the news item forum of the partner site and direct communications will continue where necessary.

**Task 10.4. Promoting standardisation of project outcomes by:**
- raising awareness at standardisation bodies about TENCompetence work
- delivering specs to these bodies produced by TENCompetence:
  - assessment model
  - learning path specification
  - LD services connector
  - competence framework
- participating in working groups of these bodies

**Task 10.5. Establishing and supporting a wider TENCompetence user group, including Account Management and promoting the TENCompetence Foundation**
The TENCompetence Foundation serves as the vehicle for establishing the TENCompetence organizational infrastructure. Through mailing lists, on line forums and FAQs the identified stakeholders are provided with resources which enable them to start work with project outcomes.
Two types of association with the project are to be made available
a) Subscribers, who can
   - follow developments through regular mailings, which could take the form of a newsletter
   - participate in forums based around stakeholder communities and public events, SIG’s communities
   - access to certain areas of the partner website
b) For selected contacts a Memorandum of Understanding is prepared defining their contribution to the project, and what the project can provide to them. On signature these contacts become Associate Partners, and training for them is structured and supported by WP9. Where necessary a core project member from the Associate Partner’s home country is appointed to act as principal point of contact with the project. In all cases, Associate Partners are referred to core project members who are working in similar fields of interest. Common ground can then be established and contributions discussed. To concretise this process, a "schedule of work” will be drawn up to bring plans to collaborate into focus. Rough working deadlines should be set where possible.

Work on identifying business models will also be carried out, building on ID 10.2, and collaborating where possible with associate partners.

Deliverables

The deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering and naming is identical to that in DIP-2. Numbering of the additionally defined deliverables for DIP-3 continues from there. All deliverables aggregate underlying internal deliverables (see next section).

- D10.2: Report with an assessment of the WP results including ID10.2 – ID10.6. (month 30)
- D10.3: Report with an assessment of the WP results including ID10.7 – ID10.10. (month 42)

Internal deliverables

The internal deliverables defined in DIP-2 after month 24 are duplicated below. Their numbering (A.C) and naming is identical to that in DIP-2. Numbering of the additionally defined internal deliverables for DIP-3 continues from there. All internal deliverables aggregate into deliverables (see section above).

Resulting from task 10.2:
- ID10.7: Compendium of workshop papers, special issues and book chapters edited by TENCompetence (month 42)
- ID10.8: Overview of workshops and events organised by TENCompetence and their impact. (month 42)
Resulting from task 10.4:
- ID10.6 Report on TENCompetence standardisation initiatives, gathering together and presenting standardisation initiatives and outcomes provided by other WPs (month 30)
- ID10.9: Report on TENCompetence standardisation initiatives, gathering together and presenting standardisation initiatives and outcomes provided by other WPs (month 42)

Resulting from task 10.5:
- ID10.2: Critical Use Cases & three potential business model outlines (carried over from DIP-3)
- ID10.3 List with contacts, potential users, subscribers and associated partners (ongoing, consolidated version month 30)
- ID10.10: List with contacts, potential users, subscribers and associated partners (ongoing, consolidated version month 42)
- ID 10.11: Updated business models (month 42, with first draft in month 36)
7 IP effort form months 25-42

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Note: the person months in WP4 are distributed over a) cycle-2 pilots and general WP4 activities (tot. 61 pm) and b) business demonstrators (23 pm).
8 Budget months 25-42

See full version
9 Budget full project period

See full version
Form A3.2

See full version
10 Consortium description and subcontracting

This chapter comprises the update of ‘Appendix A - Consortium Description’ of the DoW.

A.1 Partners and Consortium

Antwerpen left the Consortium while Agora joined as a new partner (see letter dated May 23 2008, reference U200802709mmo)

A.2 Sub-contracting

All of the major skills and knowledge for this project are present within the member organizations, so no major subcontracting is envisaged. There are only two areas currently foreseen for subcontracting.

First, in the 2nd and 3rd cycle the Water Management pilot will require a subcontract. UNESCO-IHE will run the pilot in the Nile region, but for detailed local background knowledge, day-to-day provision and support, and for local testing and evaluation of the TENCompetence infrastructure, needs to call on local resources, coordinated by a local organisation, i.e. HRI. HRI (Hydraulics Research Institute, Egypt, Cairo http://www.hri-egypt.org/main.asp) is a governmental organisation with which UNESCO-IHE already has an ongoing collaboration. The total sum of the subcontract has been budgeted up to a max. of Euro 25.000 (Funding equivalent Euro 12,500).

Secondly, a special fund to stimulate SME-participation as Associate Partners was activated towards the end of year 2 through a call for SME participation (see http://www.tencompetence.org/node/140). Actual implementation of the related activities will start in year 3 where the SMEs will subcontract to consortium partners.