DT1.4: Training facility design

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ABSTRACT	This document outlines the common training facilities, including the IT infrastructure and evaluation. Furthermore, it reports on the current development and delivery status of PROMISE training courses and specifies the any changes to delivery schedule.

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Abbreviations

BOL	Beginning Of Life
CMS	Course Management System
DSS	Decision Support System
EOL	End Of Life
LMS	Learning Management System
MOL	Middle Of Life
PDKM	Product Data and Knowledge Management
PEID	Product Embedded Information Device

1 Introduction

1.1 PROMISE Training goal

WPT1 aims to design and provide training for:

- improving knowledge on PROMISE technology and its exploitation
- supporting the development of demonstrators by delivering the necessary technical knowledge on the new technologies developed in the project.

1.2 Purpose of this document

The reference instructional design model used to design and develop the training architecture has been presented in Deliverable DT1.2, which formed the Macro phase of the PROMISE training design and delivery.

Deliverable DT1.3 specified the micro-phase and established the delivery mechanisms for individual courses. In this phase the instructional strategy is designed on the basis of the defined specifications. Furthermore specifications on learners, goals, contents and infrastructure are further detailed following a spiral approach.

MACRO-PHASE: task 1			
Contents	**Users**	**Goals**	**Infrastructure**

MICRO-PHASE: task 2		
Instructional model	**Architecture design**	**Delivery mechanisms**

IMPLEMENTATION-PHASE: task 3	
Training material	**IT infrastructure**

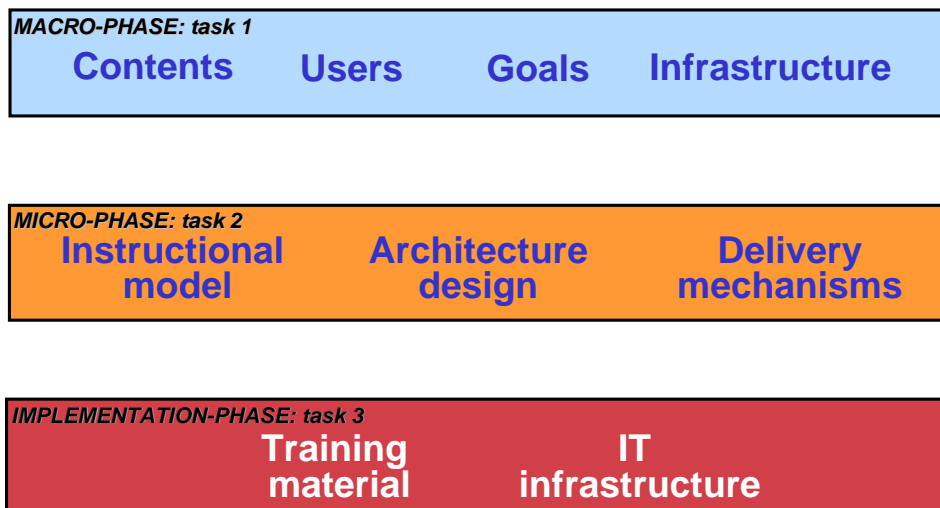**Figure 1. PROMISE Training Model: from the learner analysis to the delivery of contents.**

As the training project moves to the implementation phase, this document:

- Gives a description of the training facility common to all courses. These include the IT infrastructure and evaluation of training.
- Reports on the development and delivery of the courses.
- Presents any changes to the delivery schedule of the courses.

1.3   Structure of the document

This document is structured as follows.

Section 2 presents the **common training facility design,** including IT infrastructure and evaluation strategy,

Section 3 presents the **development and delivery status** of the courses including any changes in schedule, design or delivery format where course delivery is completed.

Section 4 draws the **conclusions** of this document.

2   Common training facility design

2.1   Distance learning facility

The technological resources to deliver eLearning contents will include:

- A learning management system, which is developed using sound pedagogical principles, and helps educators to create effective online learning communities, where users actively participate in the learning process and to collaborate in groups.

- A web site, through which learners can remotely access the learning software platform.

2.1.1   Selecting the learning software platform

To meet the user demand and specific training conditions described in DT1.2 and DT1.3, the PROMISE training consortium decided to introduce e-Learning tools or platforms to support main training activities within the project.

Commonly computer programs that are facilitating computerised learning are referred to as eLearning systems. More specific the term e-learning refers to computer-enhanced training. eLearning is usually delivered via a personal computer. It includes learning delivered by other communications technologies. Methods to support eLearning may include online lectures, tutorials, performance support systems, simulations, games, and so on. Effective e-learning is often a blend of these methods.

eLearning, therefore, is an approach to facilitate and enhance learning through both computer and communications technology. Such devices can include personal computers, electronic media, television, and other communication tools. Communications technology enables the use of the Internet, email, discussion forums, collaborative software, classroom management software and team learning systems[1].

An eLearning system to support PROMISE training activities should provide in the first place features supporting the delivery and tracking of eLearning courses and content accessible via the Internet. Such e-learning systems are called Learning Management System (LMS), or Course Management System (CMS). In the United States, CMS and LMS are refer loosely to the same

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[1] http://en.wikipedia.org/wiki/Elearning

concept, however LMS is more frequently associated with software for managing corporate training programs rather than courses in traditional education institutions[2].

Learning Management Systems can be defined as installed software which help to submit any learning contents throughout the internet and support the organisation of the necessary learning processes. Furthermore LMS place instruments for working cooperatively and offer role-based user administration at disposal.

Nowadays there is a broad range of LMS vendors in the market. In 2005 Edutech, a mandate of the Swiss Virtual Campus programme, published a survey on 40 LMS based on open source model {ref.}.

Based on this survey the PROMISE consortium made a pre-selection of three systems which are named in the short list of the survey for a more detailed evaluation. Criteria for the pre-selection included:

- Distribution of the software under the terms of the GNU General Public License
- Support for English language
- Integration of learning environment instead of a selection of tools
- Support for an active development and community
- Availability of basic eLearning tools
- Availability of basic documentation

The following list contains the pre-selected platforms considering the meets listed above:

Product descriptions are taken mainly from products' web sites.

- **ATutor**: ATutor 1.4. is an Open Source Web-based Learning Content Management System (LCMS) designed with accessibility and adaptability in mind. Administrators can install or update ATutor in minutes. Educators can quickly assemble, package, and redistribute Web-based instructional content, or conduct courses online. Students learn in an adaptive learning environment. The first Open Source LCMS to adopt the IMS Content Packaging specifications.

- **ILIAS**: ILIAS has been developed in the VIRTUS project at the University of Cologne. Through a client-server system ILIAS allows users to create, edit and publish learning units in a single system. The current version of ILIAS offers the following features: Personal desktop for each user with information about last visited courses, new mails or posts; Learning environment with personal annotations, test, glossary, print function, search engine, offline-version; Communication features like news system and discussion forums; Group system for collaborative work and organising members and resources; Integrated authoring environment to create courses without HTML Support of metadata for all levels of learning objects; Context-sensitive help system for learners and authors; User and system administration interface; European System languages including English. The web-based training platform ILIAS is available as open source software under the terms of the GNU-GPL. Universities, educational institutions and interested users may use the system free of charge and contribute to the further development.

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[2] http://en.wikipedia.org/wiki/Learning_Management_System

- **Moodle**: Moodle is a free, open source PHP application for producing Internet-based educational courses and Web sites on any major platform (Linux, Unix, Windows and Mac OS X). Courses are built up using modules such as forums, chats, journals, quizzes, surveys, assignments, workshops, resources, choices and more. Moodle supports localisation, and has so far been translated into 34 languages. Moodle has been designed to support modern pedagogies based on social constructivism, and focuses on providing an environment to support collaboration, connected knowing and a meaningful exchange of ideas.

A comparison of the three pre-selected systems is presented on Table 1 .

Table 1 Selection of online learning tools

	ATutor 1.5	ILIAS	Moodle 1.5.2
Communication Tools			
Discussion Forums	Discussions can be viewed by thread. Posts can include URLs, and can be either plain text or formatted text. Discussion threads are expandable and collapsible to view a list of topics or view an entire conversation on one screen. Threads can be sorted by author, topic, post date, and activity level. Learners can enable or disable notification of new posts sent to their email. Threads can be locked by the instructor from reading and/or writing, or attached to the top of a thread list so important threads appear first. Active threads appear near the top of the thread list. An administrator can share discussions across courses, departments, or any institutional unit.	The software includes support for discussion forums. Discussions can be viewed by thread. Instructors can associate a discussion with any course content. Instructors may create separate discussion environments for small groups. Instructors can allow learners to create groups. Groups can be open to all or only a select set of learners.	The discussion tool supports a social constructionist pedagogy model. Discussions can be viewed by date, by thread, by author. Instructors can split discussion branches from the main discussion into a new discussion. Instructors can determine the level of involvement (read, write, or post anonymously) for learners. Posts can include attachments, an image or URL. The discussion tool includes a formatting text editor. Posts may be peer reviewed by other learners. Learners may receive posts to the discussion forums as daily digests of subject lines or whole posts as email. Learners can subscribe to forum RSS feeds.
File Exchange	Learner and instructors can upload files in most document formats to a shared course library, or to a shared group library. Learners can share content from their personal folder with other learners, and with an instructor or teaching assistants. Learners can submit assignments into a drop box.		Learners can submit assignments using drop boxes.
Internal Email	Learners can use the internal email feature or instant messaging tool to communicate with other enrolled learners.	Learners can use the Internal email feature to email individuals and groups.	Learners must have an external Internet email address.
Online Journal/Notes	Learners can keep private or shared notes, associate notes with private or shared files, and print out compiled notes from within their personal work area. Learners can make notes in a journal and can select to make them private or to share them with their instructor or with other learners.	Learners can attach notes to any page. Learners can compile their notes with the course content to create a printable study guide.	
Real-time Chat	There is a PHP-based chat tool for course or group level messaging. Learners can see who else is online within their course, or group. Instructors may monitor chats. The system creates archive logs for all chat rooms. Instructors can schedule chats using the groups' calendar. The chat tool supports multiple simultaneous group discussions.		The chat tool supports images. The system creates archive logs for all chat rooms. Instructors can view chat logs and share these with learners. Instructors can schedule chats using the course calendar. Learners can see who else is online within their course and send them an instant message.

Productivity Tools

Bookmarks		Learners can create and categorize bookmarks in a private folder.	
Orientation/Help	The system includes an online course to help learners, and instructors, learn how to use the system. Learners can access context sensitive help for any tool, or for fields within tools.	Learners can access a learner manual.	Learners can access context sensitive help.
Searching within Course	Learners can use keywords to search a single course, all of their courses, or all available courses.	Learners can simultaneously search course notes and documents from all of their courses.	Learners can search all discussion threads in their course and all glossary entries.
Calendar /Progress Review	Calendar functionality is available through the ACollab add-on for ATutor. Private, group, and course calendars can be used to keep track of assignments, deadlines, due dates, etc. RSS feeds are available for a number of resources that can notify people using aggregators of changes to materials.	Learners can view their completed and pending course readings and activities. All learners have a personal home page that lists new email, all courses and groups in which the learner is enrolled.	Learners can view their completed and pending course readings and activities. Learners can view their grades on completed assignments. RSS feeds are available for a number of resources that can notify people using aggregators of changes to materials.
Work Offline /Synchronize	Learners can compile selected course content, or an entire course, into a downloadable content package for viewing offline in an accompanying content viewer. Upon re-entering a course, learners have the option of resuming at the last page viewed. Instructors can record synchronous sessions so that learners can review them asynchronously at a later time.	Learners can download course content into a format that can be printed or stored locally.	

Learner Involvement Tools

Groupwork	Group functionality is available through the ACollab addon for ATutor. Instructors can create group activities, and assign group leaders to create and manage groups. Each group has its own group home page, file exchange area, discussion forum, chat room, group email list, assessments and shared calendar. Learners can collaboratively author a document using a version control tool, and can annotate their edits.	Instructors or learners can assign learners to groups. Each group can have its own discussion forum, chat room and file exchange.	Instructors can assign learners to groups or the system can randomly create groups. Groups can either be defined at the course level and apply across all activities that support them, or at the individual activity level. In addition, the system supports a workshop module aimed specifically at peer review of learner work.
Self-assessment	Instructors can create self-assessments that learners can take multiple times. Automatically scored multiple choice and true/false, as well as random question tests are available.	Instructors can create self-assessments. The system automatically scores multiple choice type questions.	Instructors can create timed or un-timed self-assessments that learners can take multiple times. The system automatically scores multiple choice, true/false, and short answer type questions and can display instructor-created feedback, explanations and links to relevant course material.
Learner Community Building	Learners can create study groups. Learners can send email to their groups, use a shared chat space and notice board, and share material privately within the	Learners can send email to their groups, use a shared chat space and notice board, and share material privately within the group.	

	group. Learners from different courses can interact system wide using shared discussion forums.		
Learner Portfolios	Learners have personal and public folders that can be shared with other learners, with group members, with a course instructor, or with teaching assistants.		Learners can create a personal home page. learners' personal home pages may include a list of all discussion posts they have submitted, their photo, and personal information.
Administration Tools			
Authentication	Administrators and instructors can set courses to be publicly accessible, or can protect access to individual courses with a username and password. System has a password reminder option. User logins can be encrypted with SSL.	Administrators can set courses to be publicly accessible or can protect access to individual courses with a username and password. Learners can maintain their own passwords. The system can also authenticate against an external LDAP server or using the RADIUS protocol.	The system uses basic username and password authentication. The system can authenticate against a variety of sources, including external databases, LDAP directory servers, IMAP, POP3, secure NNTP and First Class servers, and Unix users through PAM. The system also supports Shibboleth and the Central Authentication Service (CAS).
Course Authorization	Instructors can assign learners limited access to instructional tools based on pre-defined roles or permissions, and create teaching assistants or additional instructors, each with their own custom privileges. Administrators can be created with limited access to play various administrative roles. Administrators or instructors can customize roles, create new or custom roles, create an unlimited number of custom organizational units and roles, with specific access privileges to course or administrative tools. Instructors or learners may be assigned different roles in different courses, or in different groups.	Instructors can assign different levels of access to their course based on the following pre-defined roles: instructors, learners, designers and guests.	The software provides tools for Administrators to assign access privileges to different group roles: Administrators, Instructors, learners and Guests. Group role privileges can be further defined into subgroup privileges. Instructors or learners may be assigned different roles in different courses. The system can access authorization information stored in other external directory services, including payment gateways.
Registration Integration	Learners can self-register. Administrators or instructors can batch add learners to a course using a delimited text file, and send a system generated email message to learners inviting them to join courses. Learner registration can be authenticated against a master list generated from a learner information system or other directory system.		Instructors can batch add learners to a course using a delimited text file or learners can self-register. The software supports integration with external information systems through an event-driven API or through a tool that is based on scheduled system exports.
Course Management	Instructors can selectively release course content and assessments based on specific start and end dates.		Instructors can link discussions to specific dates or course events. The system can synchronize course dates defined by the institutional calendar.
Instructor Helpdesk	Instructors can access an online instructor manual, context sensitive help, and an instructor support forum hosted on the product provider's site.	Instructors can access an online help manual and instructor support communities hosted through the development community website.	Instructors can access the online instructor manual, context sensitive help, and an instructor support community hosted on the product provider's site.
Online Grading Tools	Instructors can assign partial credit for certain answers. Instructors can view grades, by learner, and for all learners on all tests. Instructors can delegate		Instructors can mark assignments and all assessments not automatically scored online. Instructors can assign partial credit for certain answers. Instructors can add the grades for offline

	the responsibility for grading assignments and tests. Instructors can manually edit all grades. Instructors can create a comma-delimited version of test scores for export to an external spreadsheet program. Instructors can provide feedback on all assignments through links to the relevant course content, and through annotations.		assignments to the online gradebook. Instructors can view grades in the grade book by assignment, by learner, and for all learners on all assignments. Instructors can export a comma-delimited version of the gradebook (or a real .xls spreadsheet) for use in an external spreadsheet program. Instructors can provide feedback on all assignments through links to the relevant course content, and through annotations. Instructors can search the gradebook to find all learners who meet a specific performance criteria, mark, or status such as exam completion. Instructors can create a course grading scale that can employ either percentages, letter grades or pass/fail metrics. When an instructor adds an assignment to the course, the software automatically adds it to the gradebook. Instructors can delegate the responsibility for grading assignments.
Learner Tracking	Instructors can get reports showing the number of times, the time and date on which, and the frequency with which each learner accessed course content. Instructors can get a report that shows number of attempts and time per attempt on each assessment for individual learners. Instructors can share tracking information with learners. Instructors can get a report showing the duration of time each learner or all learners spent on course content.		Instructors can get reports showing the number of times, time, date, frequency and IP address of each learner who accessed course content, discussion forums, course assessments, and assignments. Instructors can get a report that shows number of attempts and time per attempt on each assessment for individual learners. Instructors can maintain private notes about each learner in a secure area. Instructors can get a report that summarizes individual learner performance on assignments. Instructors can set a flag on individual course components to track the frequency with which learners access those components. Instructors can monitor learners who are currently logged in to the course. Instructors can summarize all discussion posts to date by a learner.
Automated Testing and Scoring	Instructors can create automatically scored true/false and multiple choice questions, and randomize questions from a larger pool, with optional required questions that appear on all randomized tests. Instructors can set dates and times during which learners can access tests. Instructors can provide individual feedback, override automated scoring, and create individual, unit specific, or course level tests. Instructors can also create survey questions. The system provides test analysis data for individual test items, for individual tests, and for surveys. Instructors can differentially weight tests.	Instructors can create survey questions.	Instructors can create automatically scored true/false, multiple choice, multiple answer, cloze, matching, numerical, calculated and short answer questions. Questions can contain images , video, other media files, and detailed feedback on each answer. Instructors can create mathematical equations. Custom question types can also be defined. Instructors can create personal, course specific or system wide test banks from questions can be chosen to create tests for learners. Instructors can import questions from existing test banks. The system can randomize the questions in a test and the alternatives for multiple choice questions. Instructors can require a special password and set times for when learners can or must access tests. Instructors can set a time limit on a test. Instructors can limit attempts to specific IP addresses. Instructors can differentially weight tests and create grading rules. Instructors can permit multiple attempts, and whether correct results are shown. Instructors can override the automated scoring. Instructors can also create survey questions. The system provides test analysis data for individual test items. The system also supports the Remote Quiz Protocol which allows questions to be rendered and

			scored externally to the system via standards-based web services.
Customisation			
Course Templates	The software provides support for template-based content creation. Course content may be uploaded to a file manager, imported from, or exported to, a learning object repository, imported directly from the Web using a URL, or imported from an HTML editor. Instructors can clone and modify the default the templates, or create new templates. Instructors can add to, or remove course functions from course templates.	The software provides support for template-based content creation. Instructors can use templates to create announcements, calendar entries, course content, course units, glossaries, syllabus and course descriptions. Course content may be uploaded through a form or chosen from a course-specific content library.	The software provides three default course templates: activities arranged by week, activities arranged by topic, or a discussion-focussed social format. Instructors can create new course or content templates. Instructors can use templates to create discussion forums, links, course content, and resources, and these templates include a content editor with spell-checking.
Customized Look and Feel	The system provides 2 default course look and feel templates, as well as others that can be downloaded and installed. Institutions can create their own look and feel templates. Institutions can apply their own institutional images, headers and footers, across all courses, or across categories of courses. Instructors can change the navigation tabs, tools icons available, and the number and order of menu items for a course.	Institutions can apply their own institutional images, headers and footers across all courses.	The system provides 10 default course look and feel templates. Institutions can create their own look and feel templates across the entire system. Institutions can apply their own institutional images, headers and footers across all courses. Instructors can change the the navigation icons, colour schemes, and order and name of menu items for a course.
Instructional Standards Compliance	The software supports the creation, importing and exporting of IMS 1.1.3 and SCORM 1.2 conformant content packages. The software has self-tested compliance with SCORM 1.2 Runtime Environment Specification (LMS-RTE3). The system includes tools to facilitate the migration of course content between different versions of the software, and to facilitate migration to, or from, other compliant learning management systems.		The software can import course content that is SCORM 1.2 or AICC compliant, and can export quiz content in IMS QTI 2.0 format. The system includes tools to facilitate the migration of course content between different versions of the software. The provider company supports migration from the following course management systems: BlackBoard.
Instructional Design Tools	Instructors can create both linear and nonlinear learning sequences, organized hierarchically by course, lesson, or topic. Instructors can organize learning objects into learning sequences, that are reusable.	Instructors can create both linear and nonlinear learning sequences organized hierarchically by course, lesson, topic, and chunk. Instructors can organize learning objects, content libraries into learning sequences.	Instructors can create both linear and nonlinear learning sequences using a content library. Instructors can organize learning objects into learning sequences. The software supports constructivist and problem-based learning approaches. Instructors can create relationships between assignments and required resources which can then serve as templates for future lessons.
Hardware / Software			
Client Browser Required	The software supports any browser although Internet Explorer 4+, Netscape 6+, and Opera 5+ are recommended.		The software supports any browser supporting HTML 3 or higher and uses cascading style sheets (CSS) in browsers that support CSS.
Database Requirements	The system requires a MySQL database.	The system requires MySQL 4.0.14 or higher.	The system supports either MySQL or PostgreSQL databases. The system requires only one database and can coexist with tables from other applications.
Server Software	The software requires PHP, MySQL and web server	The software implements the following open	The software requires PHP 4.1.0 or later, MySQL(or PostgreSQL),

	software such as Apache or Microsoft IIS.	source utilities: Apache 1.3.28; MySQL 4.0.14; PHP 4.3.2; Zlib 1.1.4; IJG JPEG 6b; libpng 1.2.5; GD 1.8.4; ImageMagick 4.2.9; Info-ZIP Zip 2.3; Info-ZIP Unzip 5.50; and PEAR packages necessary for running ILIAS3 with PHP 4.3.1.	and a web server. The software was developed using the Apache web server. The software includes: administration reports through a web browser, course archive and restore, installation setup wizard that includes database creation, backup and archiving, tools to backup and purge either course content or learner data for individual courses and groups, rotated logs, notification services, a display of the last sessions in the system that can be filtered by either IP address or date, site configuration. Typically, local administrators install the software. The product provider offers for-fee installation consultation.
Company Profile	The software was originally developed at the Adaptive Technology Resource Centre at the University of Toronto.	The software was initially developed as part of the VIRTUS project at the University of Cologne, and is now also worked on by the Sal. Oppenheim Foundation and the Department of Science and Research of the State of Northrhine-Westphalia.	Moodle.org is an open source community launched in 2001 that has grown out of a PhD research project by Martin Dougiamas. Version 1.0 was released on August 20, 2002. Moodle.com is a company launched in 2003 that sponsors Moodle development and provides commercial support, hosting, custom development and consulting. The Moodle Partners are a network of companies that work with Moodle.com to provide services around the world.
Costs	The software is free for most uses.	The software is free.	The software is free.
Open Source	The software is distributed under the terms of the GNU General Public License.	The software is distributed under the terms of the GNU General Public License.	The software is distributed under the terms of the GNU General Public License.
Optional Extras	Administrators can download and import system languages, and create new language packs on the product web site. There are currently more than 25 language packs available. Using a PostNuke Module (pnATutor) or the Mambo Module (Mambo ATutor), the software can be integrated with a Portal/Content Management System. The ACollab addon provides group functionality. The AComm addon provides an accessible Java-based Instant Messaging and Whiteboard tool. The system can display RSS feeds. The system supports the creation of Wikis. The ATalker addon provides text to speech functionality and customization.	The system provides support for secure online tuition payment by credit card.	More than 45 language translations are available as plug-in packs. Each course can have its own glossary which can be maintained by the instructor or collaboratively by the learners. Terms in the glossary that appear in the course can be auto-linked back to the glossary. The system has a module which accepts payments for course registrations via PayPal. The system supports the creation of Wikis. The system can display RSS feeds.

The above analysis shows Moodle offers features to the same extent as the other two software chosen for comparison. Furthermore instructors' ability to freely interlink content and forums, higher personalisation features, a sound base on constructivist and problem based learning, are additional features that has led to the choice of Moodle for delivering the PROMISE training courses. Using the eLearning platform, students can schedule their learning time, since the web platform is available 24 h per day/7 days per week and collaborate in a manner that allows the exchange of knowledge from one another. The collaboration aspect is particularly important as PROMISE technologies are state of the art frontier technologies and there is no established literature outside those produced by the PROMISE consortium. This means there is a large extent of technological know-how residing within the PROMISE experts which may offer their help to learners through a collaborative platform.

2.1.2 Web site design

The website has been developed and offered to learners. Currently there are three courses with complete content: a Moodle Workshop, showing the learners how to use the website, TC3 Technical course on PROMISE PDKM technology, and TC4 Technical course on PROMISE PEID technology. 41 PROMISE users are registered and the structure for all courses is readily configured for course leaders to upload content.

Figure 2 shows the main page of the PROMISE training centre. As the initial interface news on PROMISE project, blogs featuring latest entries, personalisation links for users, and available courses are given, as well as links to other PROMISE related websites. A calendar depicting dates when courses go live, and PROMISE meetings is included.
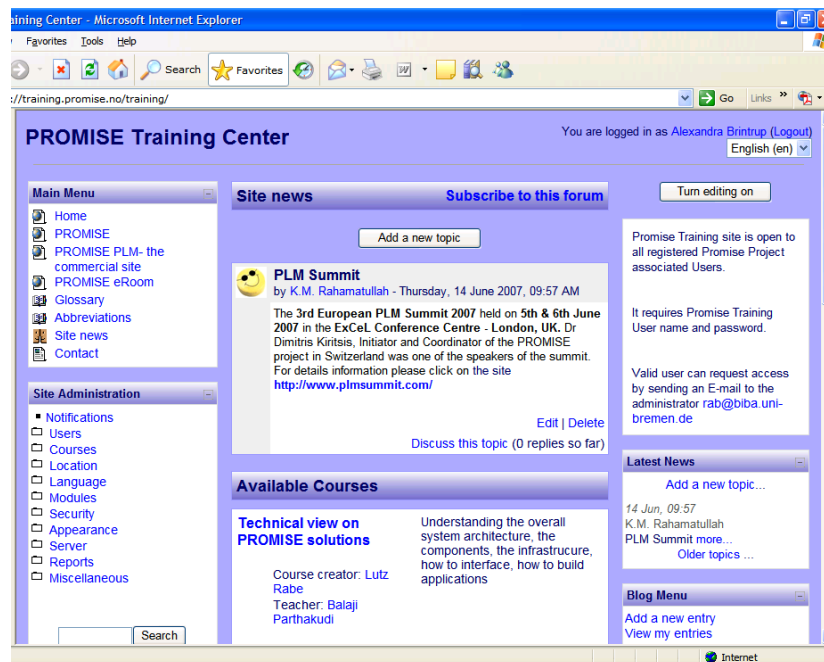
Figure 2 PROMISE training centre

The first page of a typical course may show a topic outline where contents of each module within the course are outlined (Figure 3). At the very top, a web page outlining the aims of the course is given. Following this, various items including news forums, power point presentations, supporting

documents, assignments, glossaries and external links may be given, depending on the choice of the course developer.
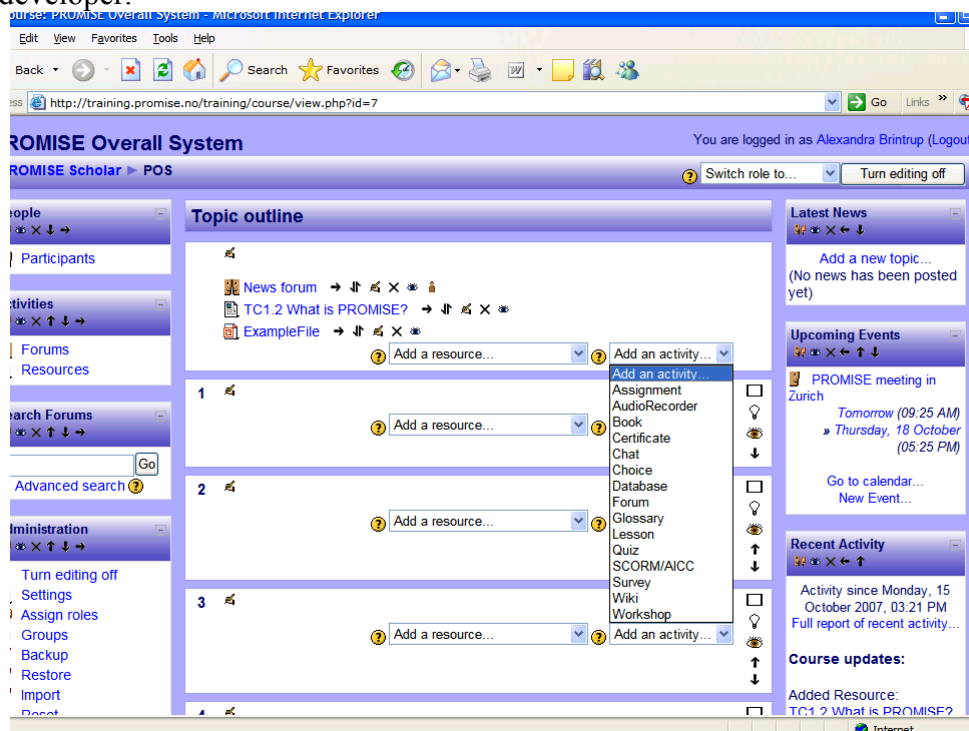
Figure 3 Example course topic outline

The website includes a generic forum whre users can leave feedback on the design of the website and recommend any improvements.

2.2 Learning Evaluation Strategy

The assessment mechanism is to evaluate not only learner satisfaction with the delivery mechanism and course content but also the level of learning achieved by learner him/herself at the end of each course. All courses will adhere to a combination of the following fourfold common assessment strategy:

1. **Evaluation of learner satisfaction**:

Evaluation at this level measures how participants in a training course react to it. Check-sheets will be used to collect the feedback from learners. The assessment will evaluate if participants enjoyed the course, if the material is relevant to the participant' work and if the participants will be able to use the training in their jobs. The target for this assessment is 70% of the participants to respond with a positive satisfaction feedback.

Appendix B is the check-sheet for learner satisfaction.

2. **Evaluation of training delivery mechanism**:

Evaluation at this level measures how participants assess the training delivery mechanism for a particular course. Check-sheets will be used to collect the feedback from learners to regarding the participants' perceptions on the stability and user-friendliness of the delivery mechanism, and the ease of understanding of the content. The target for this assessment is 70% of the participants to respond with a positive satisfaction feedback.

Appendix C is the check-sheet for the training delivery mechanism evaluation.

3. **Evaluation of learning achievement**:

Evaluation at this level measures to what level the participants have achieved learning. After the learners finish the training process for a particular course or module, they are asked to have an exam. The length, delivery mechanism and types of the examinations differ between courses. The target for this assessment is 70% of the participants to obtain the 50% pass grade in each course.

Appendix D is an example learning achievement evaluation sheet from the TC4 course.

4. **Continuous evaluation**:

Evaluation at this level measures how participants use the training knowledge, skills or attitude in practice and if the mission of the training has been advanced. A check-sheet will be sent to the learners six months after their training is given, tracking the training results in a long-term. The target for this assessment is 70% of the participants to respond with a positive satisfaction feedback.

Appendix E is the continuous evaluation sheet.

Check-sheets for the evaluation of learner satisfaction, training delivery mechanism, and continuous evaluation are common to all courses, whereas learning achievement is assessed by specific questions tailored for the course contents.

3 Course development and delivery status

3.1 TC1: Technical course on PROMISE technologies at system level

The objective of TC1 is to give an overall presentation of the PROMISE project, architecture and technology. An important objective is also to inform and motivate end users and external partners about the impact of this technology. This course is to be delivered by SINTEF.

3.1.1 Changes in course schedule, design or delivery format

TC1 will be delivered as a self study course using power point presentations.
The TC1 modules will be delivered in the period September 07 to December 07. Module TC1.8 may be delayed since information and impact/calculations is needed from other work packages (in the form of application and exploitation).

3.1.2 Development and delivery status

Status on delivery of TC1 modules is given in Table 2. Since the main objectives of TC1 is to give a brief overview of the PROMISE project and the presentations will be used in different situations to present the project an evaluation is not so relevant.

Table 2: Development and delivery status of TC1 modules

Module No.	Module name	Development completed	Delivery completed	Evaluation collected
TC1.1	Introduction to TC1 training	50	0	Not relevant

TC1.2	What is PROMISE?	100	100	Not relevant
TC1.3	Application areas	50	0	No
TC1.4	PROMISE system Architecture	10	0	No
TC1.5	PROMISE components (HW/SW)	50	0	No
TC1.6	How to integrate existing systems (HW/SW) into PROMISE architecture	0	0	No
TC1.7	How to implement PROMISE applications	0	0	No
TC1.8	Examples of business impact using PROMISE technology (demo cases)	0	0	No

3.2 TC2: Technical course on PROMISE DSS technology

The Decision Support System (DSS) technology course aims to provide a detailed knowledge of use and extension of the PROMISE DSS. There are four modules introducing different types of learners to their specific area. These modules are related to the following tasks:
- Installation of the DSS module,
- Usage of the DSS module,
- Overview of product analysis methods, and
- Extension of the algorithmic part of the DSS

The material is based on the work carried out in PROMISE WP R8. A total of 25 participants are expected, including programmers from research institutes who are involved in the development phase of the DSS modules for BOL, MOL and EOL phases (research group); and technical staff from the PROMISE demonstrator owners who will be involved in the testing phase of the DSS modules for BOL, MOL and EOL phase (end user group). This course is to be delivered by COGNIDATA.

3.2.1 Changes in course schedule, design or delivery format

Face to face content of TC2 was delivered in September 06 which constitute 50% of the delivery of this course. The remaining of the course in the form of updated documentation will be delivered in November 2007.
Face to face content of TC2 has been delivered using lectures and as a self-study problem-solving course. The remainder of the course is in the form of self-study guides.

3.2.2 Development and delivery status

50% of the development and delivery of contents is complete as given on Table 3.

Table 3: Development and delivery status of TC2 modules

Module No.	Module name	Development completed	Delivery completed	Evaluation collected
TC2.1	Introduction to Decision Support in Product Lifecycle	50	50	No

	Management			
TC2.2	Usage of a DSS	50	50	No
TC2.3	Advances in Decision Support in Product Lifecycle Management	50	50	No
TC2.4	Programming decision support scenarios in a DSS	50	50	No

3.3   TC3: Technical course on PROMISE PDKM technology

The PROMISE PDKM technology course aims to provide a detailed knowledge of the PDKM component developed in PROMISE.
At first, a total of 12 participants were trained on two face-to-face training sessions. These participants are PROMISE PDKM back-end key-users and will take care of back-end object modelling and creation. Key-users are also responsible for populating PDKM knowledge within their organisation and/or application scenario.

3.3.1   Changes in course schedule, design or delivery format

TC3 was partly delivered in a face to face training course in April 2007 with face to face lectures. The remainder of the course was distance-based and distributed to learners over May, June and July 2007. These were in the form self-study guides address specific issues of PDKM back-end usage and required previous knowledge.

3.3.2   Development and delivery status

TC3 is now completed as show on Table 4.

Table 4: Presence and pre-requisites for TC3 modules

Module number	Module name	Development completed	Delivery completed	Evaluation collected
TC3.1	PDKM description	100	100	Yes
TC3.2	Products	100	100	Yes
TC3.3	Additional attributes	100	100	Yes
TC3.4	Product structures	100	100	Yes
TC3.5	Field data	100	100	Yes
TC3.6	Events	100	100	Yes
TC3.7	Field data import guide	100	100	Yes
TC3.8	Batch-input guide	100	100	Yes

3.4   TC4: Technical course on PROMISE PEID technology

The PEID technology course aims to provide a detailed knowledge of the PEID component developed in PROMISE. TC4 course content was delivered by Cambridge. There are seven modules introducing the learners to a range of considerations when employing the PEID technology. These include considerations relating to the physics of RFID such as environmental influences on its effective usage, hardware and software integration and RFID based product data management, as well as legislation and policy issues to consider when deploying RFID solutions. A total of 25 participants were expected, including technical staff from application owners (end user group) and programmers and researchers from universities (research group). The course is

now completed with 10 participants. In addition to 10 participants from PROMISE partner organisations, 2 participants from EU FP6 project BRIDGE (Building Radio Frequency Identification for the Global Environment) were welcomed at Cambridge. The domain expertise of participants ranged from IT to mechanical and production engineering.

3.4.1 Changes in course schedule, design or delivery format

TC4 was delivered in July 2007 using face to face lectures, case studies, demos and lab modules. After lectures, case studies and demos, the learners used the Cambridge Auto ID laboratory for the RFID DIY module. A dock door simulation environment was built to offer the learners a real-life like experiment where they could play with PEID components such as sensors and RFID tags and readers. The learners were separated in groups to compete in getting high read rates by modifying the orientation of the tags on cases and pallets. This allowed a collaborative environment where learners could learn from each others' mistakes under expert supervision. Although all content was uploaded in the Moodle after the course, the main delivery and assessment of the course represents the face to face session.

3.4.2 Development and delivery status

TC4 is now completed as show on Table 5.

Table 5: Development and delivery status of TC4 modules

Module number	Module name	Development completed	Delivery completed	Evaluation collected
TC4.1	Motivation & Background	100	100	Yes
TC4.2	Components	100	100	Yes
TC4.3	Physics of RFID	100	100	Yes
TC4.4	Legislation and policy issues	100	100	Yes
TC4.5	RFID DIY	100	100	Yes
TC4.6	RFID integration a. RFID Hardware integration b. RFID software integration	100	100	Yes
TC4.7	RFID based product data management	100	100	Yes

3.5 TC5: Technical course on PROMISE Middleware technology

The PROMISE Middleware technology course aims to provide a detailed knowledge of the Middleware component developed in PROMISE. Middleware is a generic term for a piece of software that allows two or more otherwise incompatible software components to communicate with each other. With the increasing use of *distributed applications* that communicate over Internet, Middleware is more and more often used for describing the message-passing mechanism needed in such applications, where message persistence, authentication, encryption etc. are considered to be a part of Middleware functionality. Data filtering and semantic enrichment of information may also sometimes be included in the Middleware. The PROMISE Middleware

technology course aims to provide a basic understanding of the Middleware concept, its role in PROMISE and how it can be put into use by end-users.

A total of 15 participants are expected, including technical staff from the PROMISE end users who will be responsible for applying the PEID concept to suit their application (end user group). This course is to be delivered by HUT.

3.5.1 Changes in course schedule, design or delivery format

TC5 is to be delivered by the end of December 2007 as a self-study course using tutorials and case studies. However, it is possible that it will at least partially be delivered also as a hands-on course at least for Indesit in their role as end-users.

3.5.2 Development and delivery status

Table 6 shows the current development and delivery status of the TC5 training course.

Table 6: Development and delivery status of TC5 modules

Module No.	Module name	Development completed	Delivery completed	Evaluation collected
TC5.1	Middleware	20	0	No
TC5.2	PROMISE Middleware	20	0	No
TC5.3	Installation and setup	20	0	No

3.6 BC1: Business course over whole life cycle

BC1 aims to provide main PROMISE concepts, technologies, and benefits overall the lifecycle and presents a business view over the PROMISE benefits. Most people interested in the whole product lifecycle are expected to be persons at a certain management level of a company or researchers or engineers working in the lifecycle engineering area. The content on the whole product lifecycle will be useful for trainees of various industry domains and academic researchers. Learners are expected to be of diverse backgrounds, especially, IT, Logistics, Finance, Mechanical Engineering, Marketing and Sales, Research. The PROMISE whole life cycle business course aims to provide to provide the basic concept of product lifecycle management, characteristics of PROMISE PLM, conceptual system architecture, and research issues and tools of each product lifecycle phase.

A total of 33 participants are expected, including individuals interested in the whole spectrum of product lifecycle including BOL, MOL, and EOL (end user group). This course is to be delivered by EPFL.

3.6.1 Changes in course schedule, design or delivery format

BC1 will be delivered in the period from October to December 2007 as lectures and as a self study course using case studies.

3.6.2 Development and delivery status

Table 7 shows the current development and delivery status of the BC1 training course.

Table 7: Development and delivery status of BC1 modules

Module number	Module name	Development completed	Delivery completed	Evaluation collected
BC1.1	Introduction of PLM	80	0	No

BC1.2	Closed-loop PLM	80		No
BC1.3	Introduction of system architecture for closed-loop PLM	80	0	No
BC1.4	Introduction of whole product lifecycle	80	0	No
BC1.5	Introduction of BOL	80	0	No
BC1.6	Introduction of MOL	80	0	No
BC1.7	Introduction of EOL	80	0	No

3.7 BC2: Business course on BOL phase

BC2 aims to provide main PROMISE concepts, technologies, and benefits in the BOL lifecycle phase and presents a business view over the benefits deriving from the application of PROMISE technologies in the BOL phase. Typical learners interested in "business" BOL course are Producers, with leading positions in their respective companies. Background of learners can range in production, logistics, finance/controlling. Most of them do not have time to travel for training courses, therefore it is decided that the most proper way to deliver course contents in BOL will be at distance. This course is to be delivered by POLIMI.

3.7.1 Changes in course schedule, design or delivery format

BC2 will be delivered in November 2007. There are no changes expected to the original course architecture and delivery schedule.
BC2 will be delivered using lectures and as a self study course.

3.7.2 Development and delivery status

Table 8 shows the current delivery and development status of BC2.

Table 8: Development and delivery status of BC2 modules

Module No.	Module name	Development completed	Delivery completed	Evaluation collected
BC2.1	Affected value chains	75	0	No
BC2.2	Business effects on the company	25	0	No
BC2.3	Benefits and costs of adopting PROMISE BOL solutions	25	0	No
BC2.4	Business effects on partners	0	0	No
BC2.5	Cost models	50	0	No

3.8 BC3: Business course on MOL phase

The BC3 course provides a business view of the benefits deriving from the application of PROMISE technologies in the MOL phase. This course is to be delivered by BIBA.

3.8.1 Changes in course schedule, design or delivery format

The delivery date of the BC3 will be shifted to end of 2007 or beginning of 2008 depending on the availability of interested partners. BC3 will be delivered using lectures and as a self study course using lectures, tutorials and case studies. Thus, at the time no changes are planned in the design architecture of the course.

3.8.2 Development and delivery status

Table 9 shows the current delivery and development status of BC3.

Table 9: Development and delivery status of BC3 modules

Module number	Module name	Development completed	Delivery completed	Evaluation collected
BC3.1	Motivation and Background	100	0	No
BC3.2	Introduction to Product Lifecycle Management	100	0	No
BC3.3	Case study – CAT application (A2 / A5)	100	0	No
BC3.4	Information flows in Product Lifecycle Management	100	0	No
BC3.5	Introduction to the concept Extended Product	100	0	No
BC3.6	Product instance specific services	100	0	No
BC3.7	MOL environmental legislation	10	0	No
BC3.8	PROMISE Technologies	100	0	No
BC3.9	PROMISE MOL technology's business profit-cost analysis	50	0	No
BC3.10	Related publications—PROMISE dissemination on MOL	100	0	No
BC3.11	Tutorial based on other MOL Scenarios from PROMISE	20	0	No

3.9 BC4: Business course on EOL phase

The PROMISE whole life cycle business course aims to provide the economic aspects of PROMISE EOL solutions and results, with a focus on business benefits and fixed and potential costs.

Typical learners interested in "business" EOL course are End Users, with leading positions in their respective companies. Learners can come from a variety of domains, but especially IT, logistics, finance / controlling. A total of 12-24 participants are expected. This course is to be delivered by CIMRU.

3.9.1 Changes in course schedule, design or delivery format

BC4 will be delivered in November 2007 on time and there is no change from the perspective of course schedule. Meanwhile, BC4 will still be delivered as with lectures and as a self study course using case studies. However, after careful discussion and to make the courses more polished and understandable, those three case studies from BC4.10 to BC4.12 will be cut and condensed to one BC4.10, without reducing the quality of case study, as shown in Table 9. Namely, the BC4.11 case study (ELV information management, Plastic components) and BC4.12 case study (EOL information management for heavy load vehicle decommissioning) will be cut and our strength will be focused on the BC4.10 case study (ELV information management, Metallic components). The case study will be delivered with Hypertext, PPT presentation and Downloadable documents.

3.9.2 *Development and delivery status*

Until now, almost 70% modules have been developed and other 30% modules are on-going as scheduled as shown in Table 10. Because BC4 will be delivered in November 07, no module delivery has been completed and thus no evaluation of module has been collected. All the rest of work will be arranged to be accomplished in the next two months.

Table 10: Development and delivery status of BC4 modules

Module number	Module name	Development completed	Delivery completed	Evaluation collected
BC4.1	Introduction to BC4 training	100	0	No
BC4.2	Introduction to Product Lifecycle Management	100	0	No
BC4.3	Introduction to Reverse Logistic	100	0	No
BC4.4	Disposition routes in EOL	100	0	No
BC4.5	Information flows in Product Lifecycle Management	0	0	No
BC4.6	EOL environmental legislation	100	0	No
BC4.7	PROMISE Technologies	100	0	No
BC4.8	PROMISE EOL technology's business profit-cost analysis	0	0	No
BC4.9	Relative publications— PROMISE dissemination on EOL	100	0	No
BC4.10	Case study – ELV information management, Plastic components	0	0	No

4 Conclusions

This document reported on the progress of the PROMISE training work package implementation phase, forming part of Task 1.4: Delivery of training.

In doing so, it presented the selection of the common outlined the selection and design of the common eLearning facility Moodle, presented the common evaluation strategy and check-sheets for course assessment, showed the current development and delivery status of the training courses along with any changes in course design and delivery schedule. Two out of the nine courses are fully delivered and evaluated, while the remainder of the courses show good progress with most of their delivery scheduled until end of year 2007. Main changes to design and schedule of courses are summarised below:

- BC3 is shifted to the end of this year,
- TC5, originally planned as a self-study only course might have a hands-on part for Indesit,
- TC1: Module TC1.8 may be delayed since information and impact/calculations is needed from other work packages,
- BC4: Three case studies from BC4.10 to BC4.12 will be cut and condensed to one BC4.10, without reducing the overall quality of case study.

The next deliverable DT1.5 Training Assessment will present the results of the training activities and report on learner' course evaluation.

5 Contact Persons

Please refer to the following table for a list of persons to be contacted regarding this document.

Table 11: Contact Persons

Responsibility	Company	Name	Email
WPT1 Leader	Cambridge	Alexandra Brintrup	ab702@cam.ac.uk
Web-based training Leader	BIBA	Lutz Rabe	rab@biba.uni-bremen.de

Appendix A: Calendar of course delivery

Gantt chart showing course delivery schedule across months Sep-06, Apr-07, May-07, Jun-07, Jul-07, Aug-07, Sep-07, Oct-07, Nov-07, Dec-07, Jan-08, Feb-08 for the following courses:

- TC1: System Level - SINTEF
- TC2: DSS - COGNIDATA
- TC3: PDKM - INMEDIASP
- TC4: PEID - Cambridge
- TC5: Middleware - HUT
- BC1: Lifecycle - EPFL
- BC2: BOL - POLIMI
- BC3: MOL - BIBA
- BC4: EOL - CIMRU
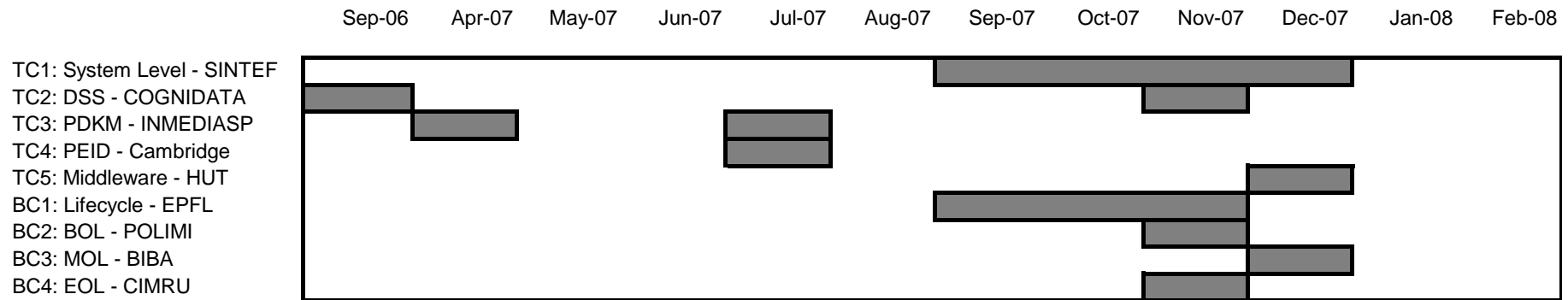
Appendix B: Evaluation of learner satisfaction

PROMISE Training Learner Satisfaction
Evaluation Form

This evaluation sheet assesses the satisfaction of the learner with the contents, and instructional delivery of a module.

Please circle the extent to which you agree or disagree with these statements with 1 being strongly disagree and 5 being strongly agree.

Course name: Technical Course on PROMISE PEID Technology

ID	STATEMENT	SCORE				
Training Course Content		**Disagree**			**Agree**	
1	I understood the objectives of the course	1	2	3	4	5
2	The objectives of the course were adequately met	1	2	3	4	5
3	The course was logically sequenced	1	2	3	4	5
5	There were examples which helped me to understand the course content	1	2	3	4	5
6	The course had sufficient content	1	2	3	4	5
7	The course had up-to-date content	1	2	3	4	5
Instruction Materials						
8	The course materials were helpful in understanding the course content	1	2	3	4	5
9	The course material will be useful for my job	1	2	3	4	5
General Evaluation						
10	My time spent on this course was worthwhile	1	2	3	4	5
11	I have learned new content	1	2	3	4	5
12	My expectations for this course were met	1	2	3	4	5
13	I would recommend this course to others	1	2	3	4	5
14	I will have an opportunity to apply the skills/knowledge I have developed	1	2	3	4	5
Instructional Presentation (Please fill this in if you have had face to face instruction)						

15	The instructors appeared knowledgeable about the subject	1	2	3	4	5
16	The instructors were responsive to my needs/questions	1	2	3	4	5
17	The instructors' presentation of the course content was clear and informative	1	2	3	4	5
18	The instructors were enthusiastic about teaching the subject	1	2	3	4	5
19	The instructors were prepared and organised for the class	1	2	3	4	5
20	Participants were encouraged to take part in class discussions and activities	1	2	3	4	5
21	The length of the course was appropriate to cover the content	1	2	3	4	5
22	The time given to complete practice activities was appropriate	1	2	3	4	5

Things you liked **MOST**

………
………
………
………

Things you like **LEAST**

………
………
………
………

Any other comments / suggestions

………
………
………
………

Thank you for filling in this questionnaire!

Appendix C: Evaluation of training delivery mechanism

PROMISE Training Delivery Mechanism
Evaluation Form

This evaluation sheet assesses the satisfaction of the learner with the mechanism used in delivering a module. The mechanism here may refer to various delivery types such as a power point presentation, a demonstration or a video.

Please circle the extent to which you agree or disagree with these statements.
1 is strongly disagree and 5 is strongly agree.

Course name: Technical course on PROMISE PEID technology

ID	STATEMENT			SCORE		
	Delivery mechanism	**Disagree**			**Agree**	
1	The module delivery mechanism was the right mechanism	1	2	3	4	5
2	Structure of the course was easy to follow	1	2	3	4	5
3	The delivery mechanism enabled me to learn the content I needed	1	2	3	4	5
	Online (please fill in only if you have used any online material for this module)					
4	The Moodle system is easy to use	1	2	3	4	5
5	The operation of the Moodle system was stable	1	2	3	4	5
6	Moodle system enabled me to control my learning progress	1	2	3	4	5
7	I followed all of the training content on the Moodle platform for this course	1	2	3	4	5

How can we improve the delivery mechanism of this course?
……
……
………………………………………………………………………………………

Thank you for filling in this questionnaire!

Appendix D: Evaluation of learning achievement

PROMISE Training Learning Achievement
Evaluation Form

This evaluation sheet assesses the learning achievement of the participant.

Course name: Technical course on PROMISE PEID technology

Please give brief answers to the following questions

TC4.1 Motivation and background

1   What are the advantages of RFID over barcodes?

2   Which one of the following is a problem during RFID readings?

   a. metal content

   b. line of sight

   c. size of tags

   d. all of the above

3   What are the different methods to overcome the problem above?

TC4.2 Components

1   Name two chipless RFID technologies

   What is not part of an UHF RFID reader operating in Europe?

     a. transmitter

     b. receiver

2   c. antenna

     d. SAW device

     e. DSP

---

1   Calculate the free space electromagnetic wavelength at 1 GHz.

2   What is gain of a dipole antenna?

TC4.6.2 RFID Sensor Integration

1   What is the difference between hardware and logical integration of RFID and sensors?

2   Can Class 1 Generation 2 RFID readers read wireless sensor nodes directly (i.e. when no RFID tag is used)?

TC4.6.2 RFID Software Integration

1   Name two technologies that can be used to specify interfaces in a way that is agnostic to programming language

2   Why are standards important in software integration?

TC4.7 Product Data Management

1   Name three essential ingredients for product lifecycle information management

2   Name three of the selection criteria for the choice of Product Embedded Information Device (PEID)

Thank you for participating in this test!

Appendix E: Continuous evaluation

PROMISE Training Continuous Learning Evaluation Form

This evaluation sheet assesses the use of the module contents in the long term.

Please circle the extent to which you agree or disagree with these statements with 1 being strongly disagree and 5 being strongly agree.

Course name: Technical Course on PROMISE PEID

ID	STATEMENT	Disagree			Agree	
1	The course enabled me to apply the skills/knowledge I have gained	1	2	3	4	5
2	Could you give an example of a time you have applied the knowledge you have gained from this module? (please continue on to question 3 if you have not used the contents of this module at all)					
3	I will use what I have learned in this module in the future.	1	2	3	4	5
4	I am continuing to develop my learning in this subject.	1	2	3	4	5
5	The time I spent on this course was worthwhile	1	2	3	4	5
6	I would recommend this course to others	1	2	3	4	5

Any other comments / suggestions

………

………

………

………

Thank you for filling in this questionnaire!