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Circulation List:	Public
Abstract	The INSTINCT project lays the foundation for the commercial take-up of the co-operation of broadcasting and telecommunication services for people on the move. It is developing a comprehensive vision of the business drivers, based on a study of user requirements and an active monitoring of the regulatory factors. It also finalises all technical aspects necessary for a wide adoption of the system: multi-modal low-power terminals, scalable network and RF spectrum engineering solutions, standardised service provisioning and content creation tools and end-to-end quality of service. INSTINCT builds e-Europe by providing more radio network access and more affordable and attractive secure services to the end user. This document presents the detailed implementation plan for the first two-year phase of the INSTINCT project.
Keywords	Co-operating services, DVB-T, DVB-H, UMTS, GPRS,

Contents

Contents (continued)

Introduction

The INSTINCT project addresses the system aspects that need to be brought together to enable the joint operations (business cases, content, services, applications, network engineering, etc) of terrestrial broadcast (DVB) and cellular (2G/3G) networks for user access to rich-multimedia services with personal devices. The system view that is required to clarify the project scope spans several administrative domains that link to system end points, and across the communication protocol stack, as illustrated in Figure 1.

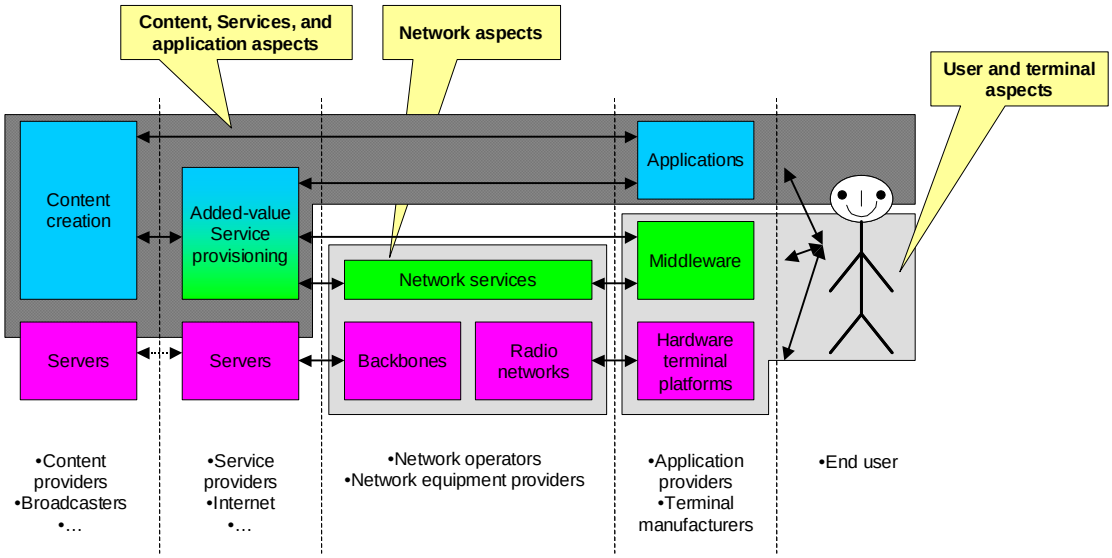


Figure 1: INSTINCT reference system model

The system reference model is broken down into five domains, representing the end-to-end value chain, and three layers, capturing the transmission, servicing and application aspects.

The INSTINCT RTD activities are organized along three streams:

- Content, services and applications for hybrid broadcast/cellular systems
- Network configurations supporting delivery over hybrid networks
- User devices for the access of users to content and enhanced services using hybrid delivery mechanisms

A horizontal stream of activities is also defined in order to address the societal and techno-economic aspects of the INSTINCT system.

The INSTINCT integrated project is divided into at least two phases of two years each, each phase having different focus and priorities depending on how receptive and mature the market will be for adopting INSTINCT concepts.

It should be noted that INSTINCT project does not start from scratch. It builds on a number of Fifth Framework projects in the areas of Cellular/Broadcast convergence and Interactive broadcasting, such as CISMUNDUS, CONFLUENT and SAVANT. These projects will already bring some of the core components that INSTINCT builds on.

Phase 1 is mainly be devoted to the development of core technologies that have been identified as enablers for the INSTINCT concepts to occur. The main focus is on equipment-related developments. At the end of this phase, the consortium will deliver:

A suite of tools for simplified and highly productive content and service creation for hybrid broadcast/cellular networks;

A system architecture including management functions (network, services)

APIs (extensions) enabling inter-working between DTV and Cellular platforms

Prototype applications in the area of e-entertainment and e-learning, illustrating the usability of the content and service creation process, system architecture

Network equipment and deployment rules that will help early pilot deployments across Europe and wider

Prototype broadcast front-ends that will be suited for mobility requirements (low-power, low volume, low cost)

Training material and curriculum to teach operational actors in order to provide sufficient ground to support phase 2 objectives.

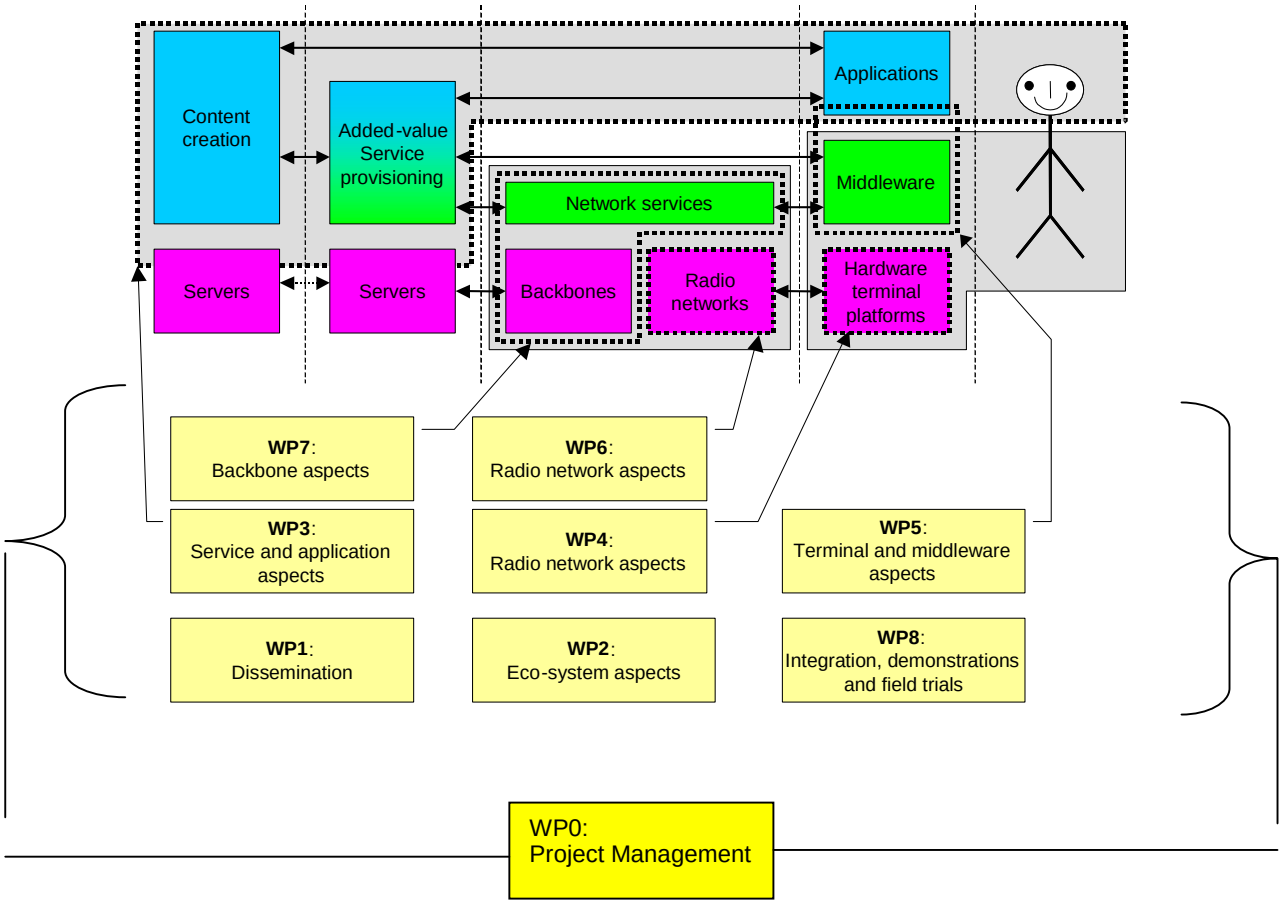


Figure 2: Scope of work packages in the system reference model

The project in phase 1 progresses in the implementation of the system reference model depicted in Figure 1. In particular, it focuses on the building blocks of the system that need to be available for the following phases. The aspects addressed in phase 1 are covered by work packages. Figure 2 depicts how the work packages defined for phase 1 address the different parts of the INSTINCT reference model.

In this document the detailed implementation plan for the first phase of the INSTINCT project is presented work package by workpackage.

WP0: Management and coordination

Objectives

The purpose of this work package is to:

To provide overview activities for the project

Integration of the gender dimension into the research

To ensure that work complies with national and EU Health & Safety regulations

Development of an exploitation strategy

Financial monitoring and reporting

To draft, negotiate and maintain the consortium agreement

Provision of legal support and advice on IPR protection and policy

To deliver the final project report

Strategy

The management structure of the INSTINCT project comprises the following:

The Project Coordinator

The Project Manager

The Management Office

The Project Board

The Work Package Leaders

The General Assembly

The Brazilian Activities Coordination

Overall project management is the responsibility of the Project Coordinator. The Project Coordinator is the intermediary between the European Commission and the Contractors and is responsible for:

Distributing the joint budget

Collating reports, cost statements and other deliverables from the Contractors for submission to the European Commission

Chairing the General Assembly and the Project Board, and following-up on their decisions

Taking overall responsibility for Brazilian activities coordination

Representing the project at the relevant Consortium Meetings and taking an active role in the concertation process

Transferring documents and information connected with the Project to and between the Sub-Project Leaders and the Contractors concerned

Ensuring that an exploitation strategy is developed, approved and implemented

Overseeing and coordinating measures for the promotion of gender equality and the integration of the gender dimension into the research

Ensuring that the work complies with national and EU Health & Safety regulations

The Project Manager's responsibilities are to:

Help the Coordinator to manage the joint budget and supervise expenditure

COORDINATE INTERNAL COMMUNICATION AT BRUNEL UNIVERSITY

COORDINATE THE WORK OF THE WORK PACKAGE LEADERS

Support the Project Coordinator with the preparation of consortium meetings and meetings organized by the Commission, in particular with regard to the dissemination of project related information at these meetings

The Project Manager is the deputy of the Coordinator is authorised to represent the Coordinator at consortium meetings.

Due to the size of the consortium and the complexity of the work, which requires financial, legal and commercialisation expertise, the Project Coordinator has the further support of a Finance Manger and a Business Manager who form the Project Management Office.

The Finance Manager supports the Project Manager with (i) The financial monitoring and reporting to the Consortium and the European Commission; (ii) The management and the allocation of the budget; (iii) Te collection and delivery of cost statements and audit certificates to the Commission.

The Business Manager is responsible for co-ordinating the project commercialisation activities, in particular the preparation of a technology implementation plan, and for conducting an audit of intellectual property developed by project partners, including the implementation of best practice processes and systems. The Business Manager also acts as Secretary to the Project Board and the General Assembly.

The General Assembly (GA) is the principal decision making body of the project. It decides on the general direction of the project, the budget allocation and the resolution of disputes in accordance with the Consortium Agreement. The General Assembly meets twice a year to approve the progress reports presented by the Project Board, described below, and to receive and approve the accounts of the previous year and decide on budget allocations.

The GA consists of one representative of each partner and each partner may nominate a deputy. In voting each partner has votes equalling the percentage of its share of the total Commission contribution to the first phase of the project. Meetings of the GA are a quorum if more than 67 percent of the votes are assembled or duly represented by a proxy. The consortium agreement sets out detailed arrangements for the management of the project, the management of intellectual property rights, confidentiality, conflict resolutions and budget allocations. The consortium agreement has been approved and signed by all project partners through their representatives.

Fifteen days prior to the meetings of the General Assembly, an agenda is circulated to each partner. Additions to the agenda may be made in writing to the Project Coordinator.

To facilitate the organization and management of the work, the project is structured in nine Workpackages. The allocation of Workpackages and the nomination of Workpackage Leaders was approved by the General Assembly at the Kick-off Meeting of the project. The Workpackage Leaders or their representatives form the Project Board.

The main function of the Project Board is to act as the executive body of the General Assembly and to:

- Coordinate the execution of Work Packages and monitor the technical progress of the work in order to ensure that it follows in the overall direction as given by the General Assembly
- Support the Project Coordinator in the fulfilling obligations towards the European Commission.
- Ensure that all work meets functional requirements
- Review and propose budget transfers to the General Assembly
- Propose changes in work sharing and budget allocation to the General Assembly
- Decide on the annual Implementation Plan for approval by the General Assembly
- Agree on press releases and scientific publications to ensure that no breaches of confidentiality occur
- Agree on strategies for the dissemination and exploitation of knowledge resulting from the project

The Project Board convenes quarterly to review the progress of the work; to approve the progress reports; to be updated on budget status and expenditure; to discuss progress of the cross-cutting activities, such as the Gender Equality Action Plan, compliance with Health & Safety regulations and implementation of the exploitation plan. The leader of Task 0.1 Coordination of Brazilian Activities was invited to join this forum by the Project Coordinator as an observer.

Fifteen days prior to the quarterly meetings, an agenda as well as the progress reports of the Work Package Leaders is circulated to all participants. Additions to the agenda may be proposed to the Coordinator in writing. The meetings are minuted and the minutes distributed to all Contractors.

The Work Package Leaders monitor the progress within their Work Package. The WP Leaders are:

- Responsible for the timely delivery of results and the preparation of quarterly progress reports for presentation and approval at the meetings of the Project Board. At the biannual meetings of the General Assembly, the Coordinator presents a status report and the WP Leaders present consolidation reports.
- Should difficulties arise, such as a delay in the delivery of results, the Work Package Leader will be immediately inform the Project Coordinator. If the Coordinator and the WP Leaders are not able to resolve the issue, the matter shall be discussed at Project Board level. The Coordinator may call extra-ordinary meetings of the Project Board for this purpose.
- In order to review the work internally, each WP Leader and their WP Team holds regular WP meetings. To limit travel costs and reduce loss of time, most of these WP meetings are conducted by telephone conferencing. Only in specific cases, where delays are expected and related work packages might be affected, are the outcomes of these meetings circulated. Otherwise progress will be reported as usual in the quarterly reports of the WP Leaders.

The communication flow for progress reporting is from the Work Package Leaders to the Project Board, and from the Project Board to the General Assembly. Proposals for decisions of the decision making body are made by the Project Board to the General Assembly. Feedback on progress reports and cost statements, proposals and decisions regarding budget allocation and work share are filtered down from the Project Board to all project partners. The General Assembly provides a formal platform for horizontal communication flow between partners, for the exchange of ideas and the discussion of emerging scientific problems.

The project ftp serves as an information resource for minutes of meetings, progress reports and correspondence between the Coordinator and the Commission. The Deliverables and Software Contributions are also held on an FTP site.

All public deliverables will be made available on the project's English language web site.

The Project Coordinator provides a monthly and a bimonthly control report to members of the Consortium using the project email reflector on the basis of monthly reports submitted to the Coordinator by the members of the Consortium. A copy of each bimonthly report will be sent to the Project Officer. The expenditure of person months is also monitored.

WP Leaders will write an executive report bimonthlyon the work achieved for the previous two months. The executive reports will be based on the monthly reports submitted by the project partners. The Project Coordinator will collate the WP Leader's reports in order to assess the general progress of the whole project and write a bimonthly Executive Summary of the progress of the project.

Milestones

M0.1	month 1	1st Meeting of the General Assembly
M0.2	month 6	2nd Meeting of the General Assembly
M0.3	month 12	3rd Meeting of the General Assembly
M0.4	month 24	4th Meeting of the General Assembly

Deliverables

D0.1	month 3	Detailed implementation plan (Report)
D0.2	month 24	Submission of the project final report with report on gender issues appended (Report)

Task descriptions

Task 0.1: Coordination of Brazilian Activities

In acknowledgement of the fact that the Brazilian partners have no prior experience of European Commission funded projects this task aims to help the Project Coordinator manage the Brazilian partners and activities to promote a real integration of their work in the Project and to manage the local technical and non-technical issues and any conflict resolution that may be required.

WP1: Dissemination and Training

Objectives

The principal purpose of this work package is the promotion of the INSTINCT cross over service concept of digital broadcast and mobile communication (e.g. of DVB-T and UMTS). Work package 1 will disseminate all findings and results of the INSTINCT project through inputs to standardisation bodies, professional associations and via pertinent presentations at international symposia and trade fairs. Furthermore the aim of the work package is to create a training scheme for the INSTINCT concept to inform users and operators alike.

These objectives lead to three main tasks within the work package:

- Task 1.1: Liaison to standardisation bodies
- Task 1.2: Dissemination
- Task 1.3: Training

Strategy

Based on the results of the INSTINCT project, relevant issues for possible new standards (if necessary) and/or extensions to existing standards will be identified and proposed. Pertinent inputs will be forwarded to these organisations after careful validation of the INSTINCT system in laboratory and field tests. The main target groups for standardisation are without doubt the various ad-hoc and working groups of the DVB Commercial and Technical Modules (DVB-CM and DVB-TM). The project brings together partners across industry sectors that jointly are able to make a very broad input to European standardisation and regulation initiatives. The consortium partners are experienced in international standardisation work (both for technical and frequency issues) and are well represented in all international initiatives and standardisation bodies relevant for the INSTINCT project.

Dissemination of the project's results is an informative information exchange and consists of the set-up of internal communication tools, the preparation of Public Relations and dissemination material, the organisation of workshops and seminars for different target groups like Broadcast Operators, Network Providers or Content Creators and the demonstration of the INSTINCT converged system at international symposia and trade fairs. The demonstration platforms will maintain visible proofs of concepts that can be used in a later stage to build complete commercially exploitable systems.

It will ensure that the acquired theoretical and practical skills are disseminated between all participants of the project, who could be major actors in the implementation of real life systems, but also outside the project as the platforms and services can be demonstrated to anyone.

In order to broaden the knowledge of the information society experts on the potential and the technicalities of the INSTINCT concept, it is not sufficient to present the results of the various INSTINCT work packages at world-wide symposia or through pertinent publications (Task 1.2). In-depth knowledge can only be handed on via specific targeted training actions. Such training will be beneficial for content creators and content aggregators as well as for service providers and network operators. Some specific training workshops for professional users are anticipated by the INSTINCT project to be held primarily in the second phase of the project on the basis of the procedure and guidance established during the fist two years.

INSTINCT anticipates such training as crucial, since its cross-over service concept, i.e. the joint usage of broadcast and telecom services in a single handheld or mobile terminal, is a prime challenge to content, service and network providers world-wide.

Planning

Figure 1 gives an overview of the planned milestones and deliverables for Workpackage 1. These are discussed in more detail in the text below.

Month 04/05	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Task 1.1		M1.1	D1.1/ M1.2															D1.2					M1.4	D1.3
Task 1.2		M1.0/1.1	D1.1/ M1.2																				M1.3/1.4	D1.3
Task 1.3		M1.1	D1.1/ M1.2															D1.2					M1.5	D1.3

Figure 3: WP1 Planning

Milestones

Milestone Number	Date	Description of milestone
M1.0	Feb. 04	**Initial project presentation (Flyer, Press release, Web-pages)** The first milestone of work package 1 consists of the preparation of dissemination material for the initial project presentation. An INSTINCT press release has been designed, that was also used for an article to the DVB-scene magazine. Furthermore, the INSTINCT-web-page covering relevant information related to the project such as project news, published papers and descriptions of the work packages were created. To make different target groups aware of the project's activities, presentations have been given at relevant conferences and events.
M1.1	Feb. 04	**Internal Workshop 1 (detailed work plan of WP1)** To constitute the detailed work-plan of WP1 an internal brainstorming session was held which was used as a starting point for a pertinent dissemination strategy. Besides the organisation for a liaison to standardisation bodies and plans for the standardisation within the project have been discussed. The last issue of the Internal workshop dealt with the matter of training workshops for professional users that are foreseen to be held in the second phase of the project.
M1.2	Mar. 04	**Approval of dissemination & standardisation plan and of layout for training activities** The third milestone builds upon the results of Milestone 1 and the INSTINCT partners should approve their joined plans for standardisation, dissemination and training.

Milestone Number	Date	Description of milestone
M1.3	Nov.05	**INSTINCT presentation and demonstration at two major exhibitions (broadcast/telecom oriented)** Important for the success of the INSTINCT dissemination work is the demonstration of the developments to the public. Consequently the project aims to present the INSTINCT platform at two major exhibitions, one focussing on the broadcast market and the other one on the telecommunication market.
M1.4	Nov.05	**Approval of structure for training scheme** This fifth milestone will lay the basis for the anticipated training workshops in phase two of the project. The procedure and the structure of the training schemes shall be approved by end of November 2005.

Deliverables

Del. Number	Title	Nature	Editor	Date	Description
D1.1	Detailed dissemination and standardisation plan	Report	IRT	Mar. 04	Deliverable 1.1 will define the detailed plans for dissemination and standardisation work. This includes Public Relations work as well as anticipated demonstrations and promotion of the project. It also takes into account the objectives of INSTINCT with respect to standardisation.
D1.2	INSTINCT training scheme "Guide book", first version	Report	Brunel	Jun. 05	The INSTINCT training scheme guidebook will be the basis for the INSTINCT training workshops in phase two of the project.
D1.3	Dissemination and standardisation report	Report	FTRD	Dec. 05	Deliverable 1.3 summarizes the work in the field of dissemination and standardisation in the first phase of the project. It describes the achievements of the project in the first 24 months, where D1.1 is used as the reference.

Task descriptions

Task 1.1 Liaison to Standardisation Bodies

The project will make its results available to all interested parties including standardisation bodies. Results of the technical developments will be communicated to the standardisation bodies as appropriate.

One major goal will be to monitor the on-going activities in the different bodies and if necessary place relevant results and findings of the INSTINCT developments directly in the groups. Pertinent inputs will be forwarded to these organisations after careful validation of the INSTINCT system in laboratory and field tests. To do so, the project has identified for each standardisation body one or more project partners to act as the bridge between the project and that group.

The main target groups for standardisation are without doubt the various ad-hoc and working groups of the DVB Commercial and Technical Modules (DVB-CM and DVB-TM). Several groups are potentially important for liaison with INSTINCT in view of subsequent standardisation actions by ETSI:

Most important amongst them are presumably DVB-CBMS and DVB-H that explicitly target to propose new DVB framework for mobile Terrestrial broadcast. In connection to those DVB-MHP, but also DVB groups dealing with Generic Data Broadcasting & Service Information Protocols (DVB-GBS), IP Infrastructure (DVB-IPI) or Measurement Group (DVB-MG).

For European level spectrum allocation issues and frequency plans the different ITU-R groups are in the focus of the project.

The Brazilian partners will especially establish a strong link to South American professional associations like ABNT, ABERT/SET and ELETROS. Furthermore the important alliance to DVB activities will be coordinated at management board level. It is envisaged to organize a DVB meeting in Brazil.

Task 1.2 Dissemination

To follow a permanent dissemination strategy the following points have to be worked out by the partners participating in task 1.2

Set up of web-page and e-mail reflector (including an FTP site) for external and internal communication

An FTP site was set up in Brunel University to make the exchange of documents available within the project. Each work package has set up its own e-mail reflectors in addition to the general INSTINCT mailing list. For external dissemination, the INSTINCT web page is being built, in a process to obtain a domain name "`ist-instinct.org`" and will be also translated into Portuguese and Spanish language.

Public Relations, e.g. to design and distribute a press release at kick-off and at important milestones

Preparation of dissemination material like flyers, PowerPoint presentations, posters

Press releases and public relations material like flyers and posters are designed and distributed at the beginning of the project and before important events and demonstrations related to INSTINCT.

Organisation of workshops, seminars and trade fare presentations

Yearly demos of the state of the art developments are planned. This means regular trade fair appearance for different target markets are foreseen. As major exhibitions for the project IBC2005 and GSM World - 3GSM World Congress were chosen by the partners. But also IFA 2005 is a place where INSTINCT developments especially by the German partners will be demonstrated. On the Brazilian side significant project presence at COMDEX Brazil or equivalent trade show is planned for 2005.

Organisation of workshops and seminars internal to the project

Internal Workshops, e.g. for the setting up of the test environment, should harmonise the knowledge of all partners inside the project. Additionally workshops focussing on DVB/MPEG and DVB-H implementations are planned for early 2005.

Representation of the project at international scientific and technical symposia such as IST summits

The partners promote the project and its results through various conferences, symposia and workshops, e.g. DVB-World, IST-Events and the Mobile Telecommunication Summits.

Task 1.3 Training

This Task deals with the transfer of the INSTINCT results about the "cross-over service concept" to the (professional) users and operators all over the world but primarily in Europe and in Brazil.

Task 1.3 will lay the basis for the INSTINCT training actions to be held primarily in the second phase of the project. The training scheme and the training scheme guidebook will be roughly developed in phase one of the project and should deal with the issues described as follows:

- Objectives and scope of the training workshops
- Target groups (Broadcasters, Industry, Network Operators, etc.) => what do they to know about INSTINCT, vs. what should they learn about INSTINCT?
- Organisation of the workshops
- How should the project address possible participants?

WP2: ECO-system aspects

Objectives

INSTINCT services are at the crossroads of TV (radio) and Telco (WEB) services, built by merging already existing applications and delivery modes from the two worlds (Telco and broadcast) in a novel set of converging services, offered to the customers on a portable receiver.

WP2 task in the project is to provide a comprehensive vision and related guidelines of:

The user's acceptance,

The services scenarios,

The architecture and network dimensioning

And, on top of all, a set of relevant business models.

Strategy

This work package is broken down into four tasks:

Task 2.1: Human factors (led by UoC)

Task 2.2: Reference scenarios (led by RBB)

Task 2.3: System architecture and dimensioning (led by TDF)

Task 2.4: Business modelling (led by FTRD)

Task 2.5: Business model and service scenarios in Latin America (led by CERTI)

The WP2 global timing is divided in 5 sub-phases

Phase 1 (first two years) of INSTINCT WP2 work is divided in five sub-phases:

Sub-phase 1 will be devoted to extracting **early service scenarios**, use cases and system architecture and requirements from the partners experience in previous 5th PCRD IST projects (namely CISMUNDUS, SAVANT, CONFLUENT). This will allow other work packages to start their specification work quite quickly

In sub-phase 2, Task 2.2 will freeze the service scenario and related services' list, as based on early user acceptance requirements from Task 2.1, system requirements from Task 2.3, and business related requirements from Task 2.4 and set up service scenarios brainstorming session in order to update INSTINCT service scenarios

In sub-phase 3, Task 2.3 will refine overall system architecture and requirements, have a more precise insight on required functional interfaces between service provision, access network, user terminal and INSTINCT platform. Finally network dimensioning and requirements linked to selected INSTINCT scenarios will also be considered. This phase will involve coordination with and among several other work packages, working on detailed specification and implementation of the system

In sub-phase 4, user validation of selected service scenarios and network concepts will take place, mainly based on service mock-up and (possibly) early prototypes.

In sub-phase 5, business drivers (including regulation, market aspects, business models and techno-economics) evaluation will be conducted to assess viability of selected INSTINCT scenarios and platform.

Planning & milestones

The 5 phases of WP2 work are described in the Figure 2, including the milestones and the deliverable (on the bottom line).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
P1			**2.1**																					
P2				**2.2**					**2.3**															
P3										**2.4**														
P4																								
P5																								
D2									**1**						**2**									**3/4**

Figure 4: WP2 Planning

M2.1: MONTH 3 EARLY SERVICE SCENARIOS, AND SERVICES COMPONENT DOCUMENT

M2.2: month 4 Service requirements and related architecture and global requirements

M2.3: month 8 Service mock-up and user questionnaires, as input to service scenario user evaluation

M2.4: month 9 Early business model document

Deliverables

D2.1: month 9 Description of targeted scenarios and related services (Report)

D2.2: month 15 Architecture, dimensioning and requirement document (v1) (Report)

D2.3: month 24 Architecture, dimensioning and requirement document (v2) (Report)

D2.4: month 24 Targeted services *vs* business drivers and user acceptance (Report)

Task descriptions

Task 2.1 Human factors

The user acceptability **-- human factor –** is a condition of a new service success, both from the service point-of view itself, but also from the terminal (human interface) acceptability aspect and will be studied in the project, both to provide guidelines for deriving early technical requirements and new service scenarios and, later, to obtain user validation on targeted service scenarios.

The job will be organised as follows:

- Creation of a **list of research questions** based on the requirements of M2.2
- Making illustrations of the scenarios: **Mocking up of the scenarios**
- **Design of the user's study**:

  Selection of the sample

  Creation of the protocol for the interviews: questions linked to each step

  Selection of place, recording equipment, material

  Experimental design:

UoC (P19) will lead this task.

Task 2.2 Reference scenario and INSTINCT services

Developing **reference scenarios** and related services is a key point in the project in order to produce requirements to the others WPs. Beyond demonstrating novel technologies, INSTINCT ultimate goal will be to describe new and enhanced services offer to the final user. Two main scenarios will be described, one for a Telco driven business model, and the second for a Broadcast driven one. A third Services driven scenario (virtual broadcast and Telco operator model) will be investigated.

INSTINCT services will be selected from any combination of "pushed" bouquets of services together with interactive Telco "point-to-point" ones (e.g. from mobile interactive TV to "on demand" broadcast of alert messages, combined with any mobile multimedia interactive Telco service). A basic idea is to make existing broadcast content originating from a set of different sources (ranging from Teletext to TV) available through (new) mobile radio channels and enrich such services with novel interactive features provided by cellular radio communication networks (SMS, www portal, alert messages, custom pushed information, etc.).

Derived from the two scenarios a INSTINCT service list will produced, in which the services will be ranked regarding their planned used in the INSTINCT project: 1) For business modelling; 2) For human factor and user's acceptance analysis and, eventually, 3) For INSTINCT project demo implementation and demonstration.

RBB (P06) will lead this task.

Task 2.3 System architecture and dimensioning

Directly related to the service scenarios **system architecture and dimensioning** will be produced within this WP2.

As for Task 2.2, and to achieve quick service-driven guidance for other WP, overall service architecture and system aspects will first be derived from in-depth analysis of former IST projects (CISMUNDUS, CONFLUENT, SAVANT). Then analysis of relevant standardised interfaces (from the Telco and broadcast world) and elaborating on service requirements and dimensioning will lead to the production of a more detailed overall architecture and system aspects description and technical requirement document.

Related to that task, as an early deliverable, a "dependency list" against WP3 (services), WP5 (terminal) and 7 (network) will be produced in order to validate the early service selection proposed on T2.2.

TDF (P15) will lead this task.

Task 2.4 Business Modelling

Related **business drivers** (market, regulatory, business modelling and technico-economical aspects) will be studied in order to assess the practical viability of the services scenarios produced.

Early business, regulatory and market requirements will first be taken into account to focus service scenario brainstorming. Then Business drivers will allow pragmatic evaluation and economical validation of derived platform architecture and service scenarios.

Two main business models will be addressed in this task. One based on a Telco-driven model and the second based on Broadcast driven model. A third business model based on a "service-driven" approach will be investigated.

FTRD (P03) will lead this task.

WP 3: Content, service and application aspects

Objectives

This work-package is responsible for the development of tools for creation of content and services and the management of services. This is organised into 3 main work packages as depicted in Figure 3.

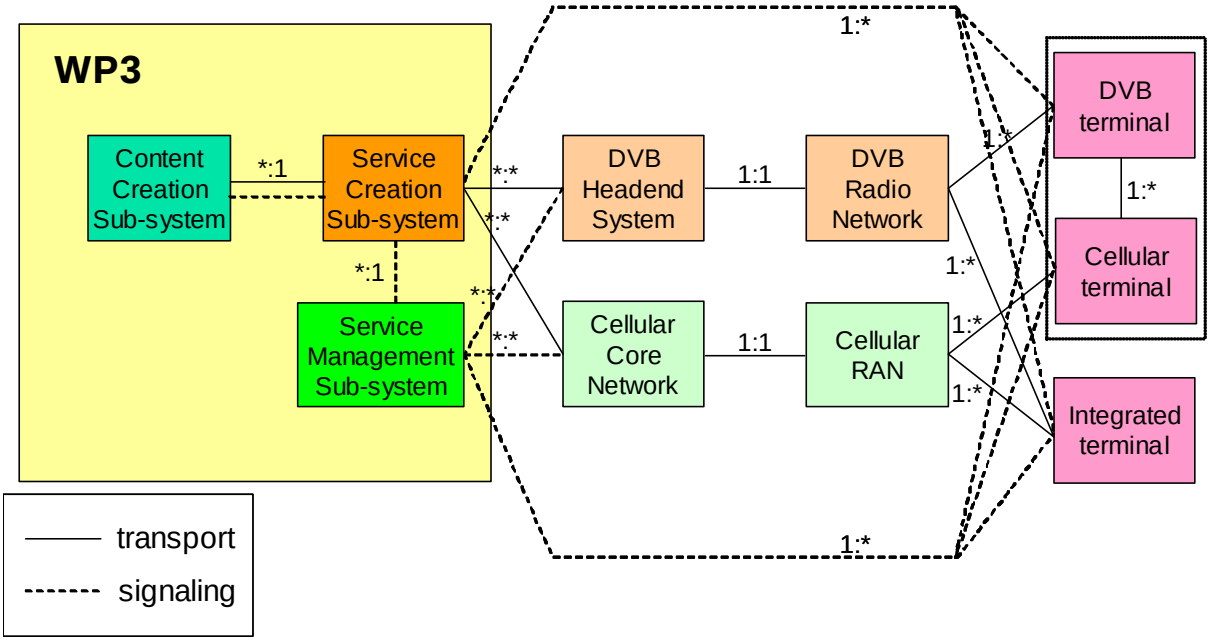


Figure 5: Sub-system responsibilities of WP 3

Its objectives consist of designing and implementing:

(1) Packaging of content independently from the target terminal and associated delivery network,

(2) Network-independent service components reusing the previously produced content and generate the associated terminal application,

(3) Adapt service is specifically to the targeted delivery networks,

(4) Semi-automatically generate applications and user interfaces to be run on target devices in order to accelerate the application design process.

(5) Service Level Agreement (SLA) framework between the Service Manager, Service Creators, End-Users of terminals and Network providers.

(6) Service Management system that provides a service scheduling system to announce and activate services and sessions in a manner that is applicable to cellular, broadcast and independent centred service provider environments.

(7) Service Manager that manages the integrated SLA framework by monitoring service level provided by the Network providers and cross checking this with end-to-end service level monitoring with the user terminal. Long-term records are kept to establish service level trend of extended period of time (weeks/months/years).

(8) Personalised Service manager that provides a list of services that is available to end users based on their stated user preferences and any terminal type that the end-user happens to be using.

(9) User Manager that administers the day-to-day transactions with the end user such as Contract Management, Subscription Management, (Authentication/Authorisation and Billing: 2nd Phase), where applicable.

The interdependences with the other work packages and tasks are depicted in Figure 4.

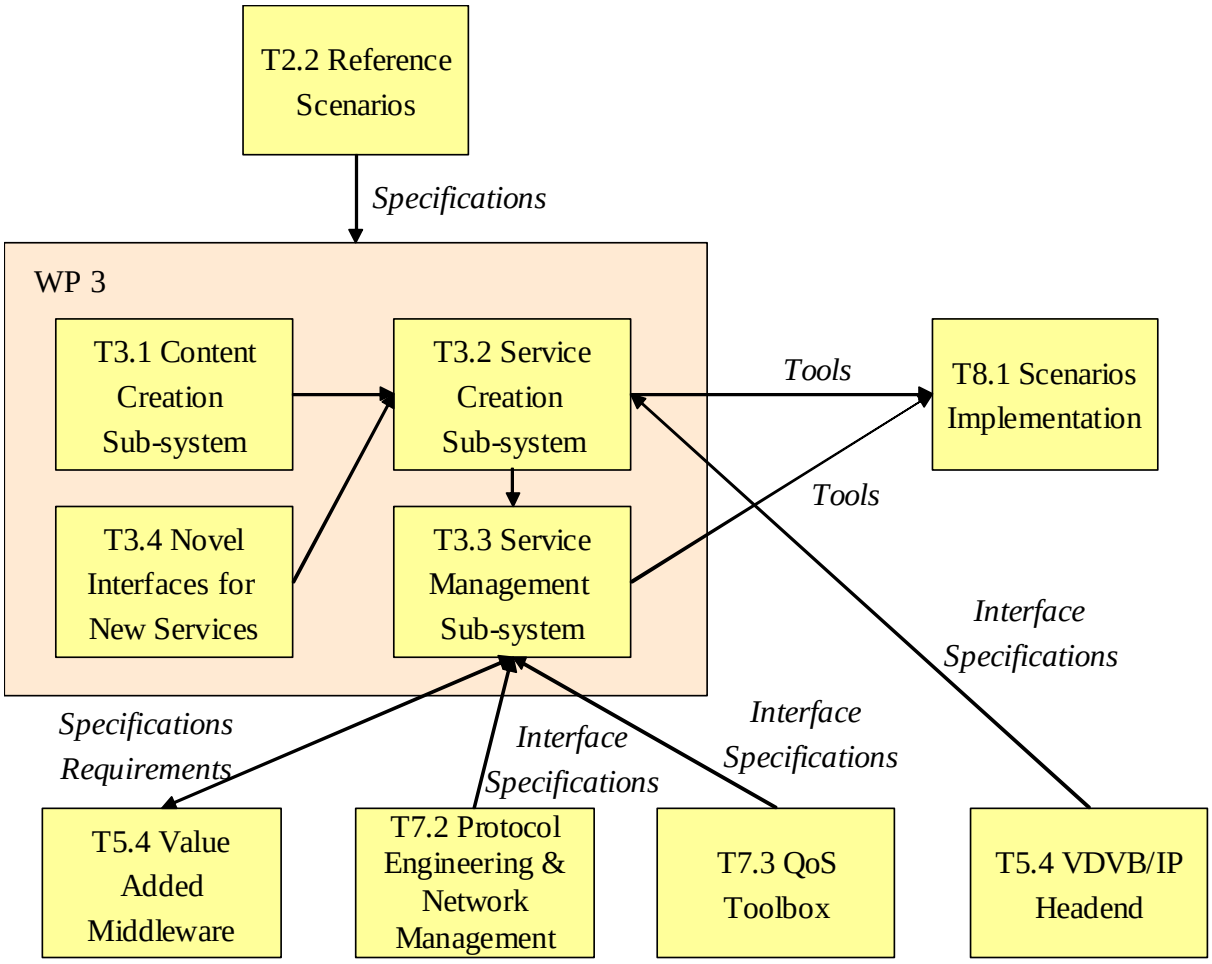


Figure 6: Interdependencies of other WPs with WP3

Strategy

The workpackage will rise to these challenges using the following strategy:

1. Functional Analysis and Specification – The WP3 system will be subdivided with increasing order of granularity into sub-systems, components and functions. The functional specification of each function and the dependencies between functions will be derived for all WP3 functions and for functions within WP 5 and 7.

2. After the functional; analysis is completed then the operation of the overall system will be designed using sequence and activity diagrams and a common understanding of the operation of the whole system will be established.

3. Requirements Analysis of Service Scenario – The service scenario will be studied and a requirements analysis will be made to derive all the functional components required within WP3 to provide for the service scenarios.

4. Check Functional analysis meets service scenario requirements and make improvements as required – Any function that is required for the service scenario that has not been specified in the initial Functional Analysis and Specification will be added. Any required modification to the operation of the whole system will be designed and documented using the sequence and activity diagrams.

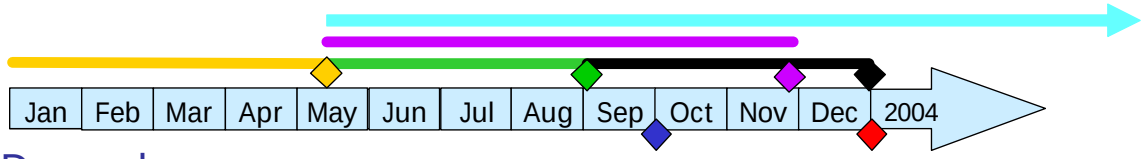
5. Metadata and Interfaces – The system diagram generated in the Functional Analysis and Specification will be used to identify all the interfaces between components. Metadata and software interfaces will be defined between each component.

6. Design of Sub-systems for implementation – The functions, components and subsystem will be designed. Object oriented software design will be used throughout. A class description and object relationships will be derived from the functional specification.

7. Implementation, integration and test. – Implementation will start as soon as the functional analysis and specification has been completed. Systems will be ready for integration and test by WP8 early 2005. There will iterative process to improve the systems based on test results. This process will last throughout the second year of the project until September when the system will be ready for demonstration at IBC 2005.

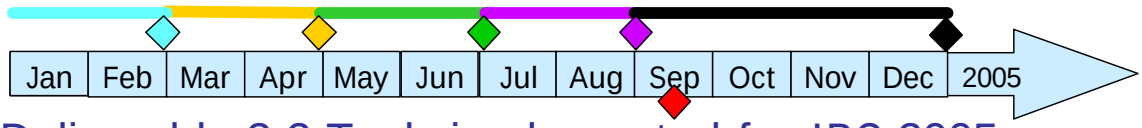
Planning

Year 1



- Dependency
  - Deliverable 2.1: Description of Extended CISMUNDUS targeted scenarios
- Deliverable 3.1: Specification and Design of Tools
  - Initial Functional Analysis and Specification
  - Requirement analysis of service scenario and update of functional analysis and specification
  - Specify interfaces and metadata between WP3 sub-systems and between WP 3, 5 and 7 systems
  - Design of Sub-systems for implementation
  - Implementation of sub-systems

Year 2



- Deliverable 3.2 Tools implemented for IBC 2005
- Implementation of sub-systems
  - First prototypes to WP 8
  - Second version of prototypes to WP 8
  - Third version of prototypes to WP 8
  - Final system to WP 8
  - Deliverable 3.3: Disseminate and plan for second phase of project

Table 1: WP3 Person month Expenditure

1	2	3	4	5	6	7	8	9	10	11	12	13
Brunel	Dibcom	FTRD	IRT	MSPS	MLABS	Optibase	RBB	Netikos		PS	RAI	RS
23	0	12	2	0	15	24	5	44		0	0	0

14	15	16	17	18	19	20	21	22	23	24	25	26
Siemens	TDF	Thales	-System:	TUBS	UoC	UPM		UEA	PUSP	Cesar	GENIUS	CERTI
12	0	0	0	0	0	0		0	0	24.9	0	0

Milestones

Milestone Number	Date	Description of milestone
M3.1	December 04	Tool Design
M3.2	August 05	Tool Implementation

Deliverables

No.	Title	Nature	Editor	Date	Description
D3.1:	Content, Service & Application Tools Design	Report	Brunel	Dec 04	Specification and design of metadata, interfaces, functions and tool required
D3.2:	Content, Service & Application Tools Implementation	Prototype		Aug 05	Implementation of metadata, interfaces, functions and tool required
D3.3:	Content, Service & Application Tools Dissemination	Report	Brunel	Dec 05	Dissemination of metadata, interfaces, functions and tool that have been designed and implemented

Novel Contributions

	Contribution Name	Responsible Partners	Description of Contribution
1	Metadata Framework	FTR&D, Motorola, Brunel, Netikos	This is an XML description of: • ESG consisting of services, content, sessions and schedule for delivery over DVB-H, DVB-T and UMTS networks. • Contractual framework consisting of User Contract, Network Contract and Service Contract • Quality Assurance framework consisting of end-to-end service monitoring and network (probe) monitoring.
2	Content Creation Tool	Brunel	This is a tool for content creators to describe AV, Web, Image and Text content and to loosely group content into programs and organise them into topics.
3	Service Creation Tool	Brunel	This is a tool for service creators to describe what, when, where and how services bearing content should be delivered to end-user terminals. Its service description defines the different scaled versions of content for a service. Its schedule description defines when a service is delivered, its session description defines where (which DVB-H cell) and how (over DVB-T/H or UMTS network) services should be delivered.
4	Scaled UI and Automated MHP Application Generation Tool	Brunel	This is a tool for service creators to first simulate services and then generate scaled versions of the UI and applications for operation on MHP end-user terminals.
5	Scaled UI and Automated MIDP Application Generation Tool	Cesar	This is a tool for service creators to first simulate services and then generate scaled versions of the UI and applications for operation on MIDP end-user terminals.
6	AV Content Transcoding and Transrating Tools	Optibase	This is a set of tools for transcoding and transrating MPEG-1, MPEG-2, MPEG-4 and Windows Media AV.

	Contribution Name	Responsible Partners	Description of Contribution
7	Service Scheduler Tool	Netikos, Motorola, FTR&D	This is a tool for service managers to group services into bouquets with common themes and to announce services within an ESG framework in a way that conserves battery power at the end-user terminal.
8	User Manager Tool	Motorola, FTR&D	This is a tool for service manager to deal with all unicast interactions with the end-user terminal and business players. This includes establishment of end-user contract and user profiles, on-demand subscription of services, personal unicast service management and access of terminal profile from terminal manufacturers.
9	SLA Monitoring Tool	Motorola	This is a tool for service manager to gather the quality of service data for services from network edge probes at the edge of delivery networks.
10	End-to-End Service Monitoring Tool	Netikos	This is a tool for service manager to monitor the quality of services as perceived at the end-user terminal.
11	Service Management Tool	Brunel	This is a tool that uses learning and prediction to determine whether SLA need to be renegotiated on the basis of measured data from SLA Monitoring tool and end-to-end Service Monitoring tool.

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Descriptions of Work and Responsibilities

Table 2: Task 3.3 Functions and Responsibility Assignment

Sub-System	Component	Ref	Function	Function Description	Comment	Responsible Partners	Other Contributing Partners	Other Contributing Partners	Other Contributing Partners	Other Contributing Partners
Service Management	User Manager	UM1	User Contract Management	Open Account: User registration is done once when the user registers with a service provider. It includes the registration of user and the definition of its contract profiles.		Motorola				
Service Management	User Manager	UM2	User Profiles Management	Create / Update Users Preferences		Motorola	FTR&D			
Service Management	User Manager	UM3	Terminal Profiles Management	Create/update a new entry in the database for a new terminal.		Motorola	FTR&D			
Service Management	User Manager	UM4	Service Subscription Management	On demand subscription initiate and terminate and record-keeping on a user basis.						
Service Management	User Manager	UM5	Accounting, Authentication and Authorisation	Before the user interacts with any interactive service component he needs to be authenticated to access the services (or be provided with authorisation). This authentication process could have a hierarchical structure with the authentication system of the telco network operator. Include 3 elements (Java	Cellular network authenticaion already in place but will not be used by application authentification system					
Service Management	User Manager	UM6	Personalized service list management	On demand of the terminal, "Personalized Service List Management" replies to the user the list of service available for this user corresponding to his Preferences and his terminal capabilities. This encludes portals for pulling by end-user terminals. Create, edit and delete Categories and Service Sets, managed in a hierarchy.		Motorola	FTR&D			
Service Management	User Manager	UM7	Billing Process	Billing Records Generation: time spent, service consumed (define architecture but not implement in project), subscription, licence purchace, VOD purchase, micro purchase (values < £10) administered by network operator, macro purchase (£>10)	Not in Phase 1					
Service Management	Service Scheduler	SS1	Session Announcement (of Information over Broadcast Channel)	Make the announcements to the end users using relevant protocols e.g.: SAP and SDP generation and management		Netikos	Motorola	Siemens	FTR&D	
Service Management	Service Scheduler	SS2	Service Announcements (of Enriched Informationover broadcast channel)	the same as for SS1 but for service announcements		Netikos	Motorola	Siemens	FTR&D	
Service Management	Service Scheduler	SS3	Service activation	network resources activation and servers activation		Netikos				
Service Management	Service Scheduler	SS4	Service Scheduling	Monitors the time table in order to trigger SS1 SS2 SS3.	Integrated within SS1, SS2, SS3 and SS5					
Service Management	Service Scheduler	SS5	ESG Update	Alerting/notificaion system broadcasting alerts to users alerting users in a separate manner to that used in SS1, SS2, SS3		Netikos	Motorola	FTR&D		
Service Management	Service Scheduler	SS6	Security Announcement (of Information over Broadcast Channel)	Delivers key to decrypt encrypted content at the terminal	Not in Phase 1	Phase 2				
Service Management	Service Scheduler	SS7	Service Categories Announcement (over Broadcast Channel)	A hierarchy of of topics with available services at the leaf nodes.	Integrated into Push Broadcast Portal					
Service Management	Service Scheduler	SS8	Service Description Formatting	Adapt the base service decription to suitable for different announcement mechanisms and formats	This is now a lower level function within SS1, SS2, SS5					
Service Management	Service Scheduler	SS9	Service Announcement Pushed Portal	Broadcast portal is pushed to terminal that presents the various services accessible on the broadcast channel and their counterparts accessible via a cellular link e.g. Service Categories, Service,		Netikos				
Service Management	Service Scheduler	SS10	Service Announcement Pulled Portal	Pulled telco portal that presents the various services accessible on the cellular link		Motorola				
Service Management	Service Scheduler	SS11	Category Manager	Create, edit and delete Categories and Service Sets, managed in a hierarchy	Replaced by packages which are groups of services and subservices with sessions and subsessions.					
Service Management	Service Scheduler	SS12	File Delivery Protocol							
Service Management	Service Manager	SM1	Delivery Network Switching	This function needs to take measurements of service usage over days/weeks/months and reschedule services for delivery over different networks over these longer periods of time (days/weeks/months) based on simple trends.		Motorola				
Service Management	Service Manager	SM2	End to End Service Monitoring	Monitors service availability and performance as seen from the user point of view at the application layer		Netikos				
Service Management	Service Manager	SM3	Service Level Agreement Monitoring	Understand if the contractually agreed SLA was delivered by accessing all the data from the network monitoring points and checking to see if this data agrees with the end-to-end service monitoring data.		Motorola				
Service Management	Service Manager	SM4	Service Level Agreement Establishment	Establish SLAs between Service Manager, Network, User and Service Creator. These agreements are long term (weeks, months, years) dynamic in nature with WP 5 and 7. Issue: what relation does this have with the business plan of organisations (e.g. entertainment, information etc organisations).		Motorola				

Table 3: Task 2.3 and 3.4 Function and Responsibility Assignment

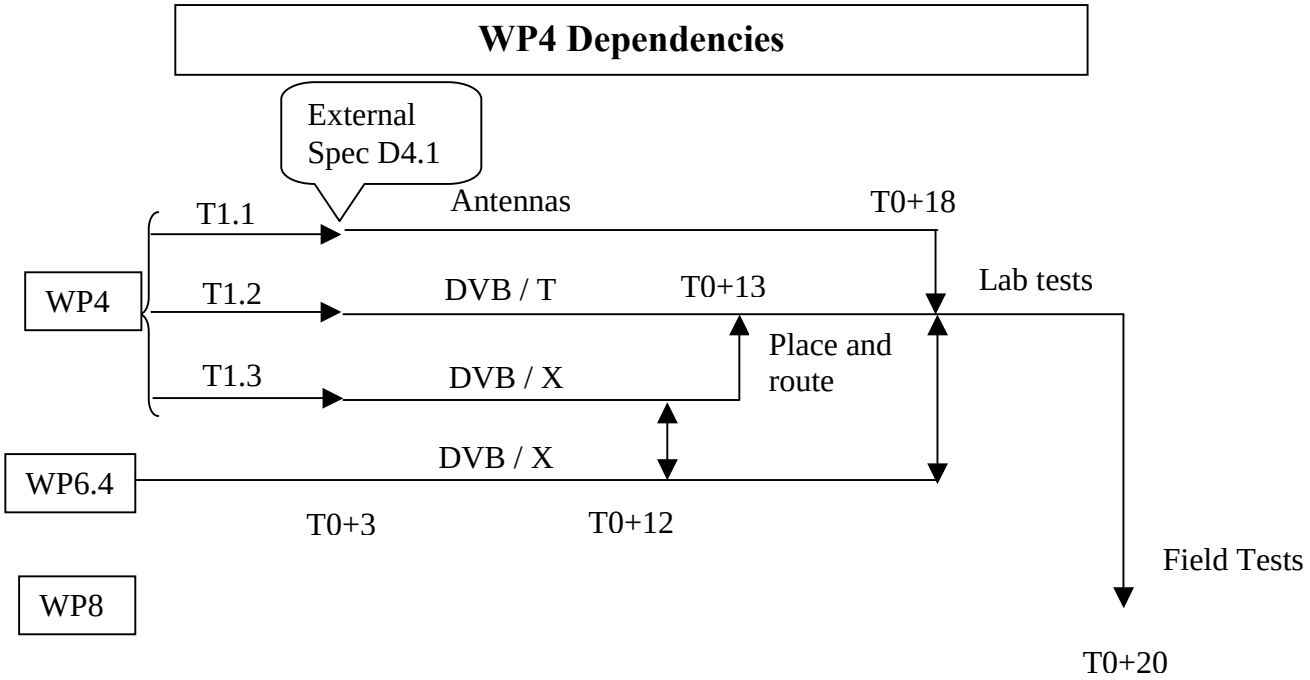
Sub-System	Component	Ref	Function	Function Description	Comment	Responsible Partners	Other Contributing Partners	Other Contributing Partners	Other Contributing Partners	Other Contributing Partners
Service Creation	Content Packaging	CPa1	Content Delivery	Use streaming protocols for delivering media over radio networks. Streaming BTFTP or Flute		IRT				
Service Creation	Content Packaging	CPa2	Transcoding and Transrating	Transcoding and transrating of live media. For pre-recorded media transcoding and transrating is made in content processing CPr1 off-line.		Optibase	RBB: we can provide MPEG2 content for transcoding, etc.			
Service Creation	Content Packaging	CPa3	Delivery Control	Service scheduling (SS4) drives the delivery control to enable the appropriate transcoders and transraters		Brunel	RBB: we can provide requirements about priority of content delivery			
Service Creation	Interactive servers	IS1	Application server	e.g. interaction for taking bets in an e-betting service and announcing winners or for taking orders in an e-commerce. Authenticating users for accesing these services	Only authenticaion in first phase for applications only	Netikos				
Service Creation	Service Description	SD1	Service and Session Description Generation	DVB-T/H and UMTS network parameters, general service and session data, session start times, conditional access information. Issue: Is the WP 3/project addressing IP over DVB-H only or will there a DVB-T element. The final time, bandwidth,bearers and loaction features will be done by this function thanks to intercation with the SM4		Brunel	Netikos	RBB: the parameters are given, we could provide requirements for bandwidth based on the services		
Service Creation	Service Description	SD1.1	QoS Description Generation	error rate, delay, switching thresholds, delivery parameters		Brunel	Netikos			
Service Creation	Service Description	SD1.2	Location Description Generation	Graphical representation of transmitter and coverage area geometry on which services can be located to on or more areas. Issue: Ask WP6 what are the planned coverage area for DVB-H and DVB-T		Brunel	Netikos			
Service Creation	Service Description	SD1.3	Bandwidth Availability	The Service Creator has a contract with the Service Manager defining the bandwidth available for his services.		Brunel	Netikos	RBB: we could provide requirements for Option 2		
Service Creation	Service Description	SD2	DRM keys management	Access of security keys.Not known if this is in first phase of project		Phase 2				
Service Creation	Service Description	SD3	Scaled Content Description Generator	Define "base" and "scaled" AV, Images, HTML etc content		Brunel		RBB: we can provide requirements		
Service Creation	Service Description	SD4	Service Level Agreement Description Generation	Service Level Agreement between Service Creator and Service Manager. See SD 1.3		Brunel		RBB: we can provide requirements		
Service Creation	UI Generation	UI1	Scaled UI Generator	Generate UIs off-line for different types of end-user terminals screen sizes and terminal capabilities (e.g CPU power). The user interface that the user will see. Keep user interface simple enough that they can be used for Tablet PCs and for PDAs.Issue: Should HTML browser be used for the user interface?		Cesar	Brunel			
Service Creation	Application Generation	AG1	Xlet/MIDlet Application Generator	Generate an MHP-Xlet/MIDP-MIDlet for each service and each terminal type.		Cesar (MidLet)	Brunel(Xlet)			

Table 4: Task 3.1 Functions and Responsibility Assignment

Sub-System	Component	Ref	Function	Function Description	Comment	Responsible Partners	Other Contributing Partners	Other Contributing Partners	Other Contributing Partners	Other Contributing Partners
Content Creation	Content Processing	CPr1	AV Content Encoder	Encode all AV content. Agree a format with Content creator,		Optibase	RBB: we can provide requirements			
Content Creation	Content Processing	CPr2	Images, graphics, text, sound content encoder	Encode images, graphics, text, sound. Agree a format with Content creator, include abstract version of each content e.g. clips, images etc		IRT	RBB: we can provide requirements			
Content Creation	Content Processing	CPr3	Pre-encoded Content Access	from ftp server		IRT	RBB: we can provide requirements			
Content Creation	Content Processing	CPr4	Digital Watermarking	Adds a digital watermark to video, images and audio to establish ownership		Phase 2				
Content Creation	Content Annotation	CA1	Content Description Generator	Contains all description of content (for one blueprint of content: bit rate, screen size). Classify content into topics. Issue: How compatible do we want our content description do be with TVAnytime or MPEG-7 content description.		Brunel	RBB	Siemens	FTR&D	RBB: we can provide requirements
Content Creation	Content Annotation	CA1.1	"Pre-recorded" Content Description Generator			Brunel	RBB	Siemens		RBB: we can provide requirements
Content Creation	Content Annotation	CA1.2	"Live" Content Description Generator	Some description of the live content can be made before the "live" broadcast whilst other description has to be provided during broadcast		Brunel	RBB	Siemens		RBB: we can provide requirements
Content Creation	Content Annotation	CA2				Brunel				RBB: we can provide requirements
Content Creation	Content Annotation	CA3	DRM Definition			Phase 2				RBB: not an issue for Phase I
Content Creation	Content/ Description Integration	CI1	Content/Description Aggregator	Aggregate content from different content providers using a content management system. Establish loose relationships between content descriptions (e.g. from radio, TV, Internet)		Brunel				RBB: we can provide requirements

WP4 : Terminal front-end aspects

Planning



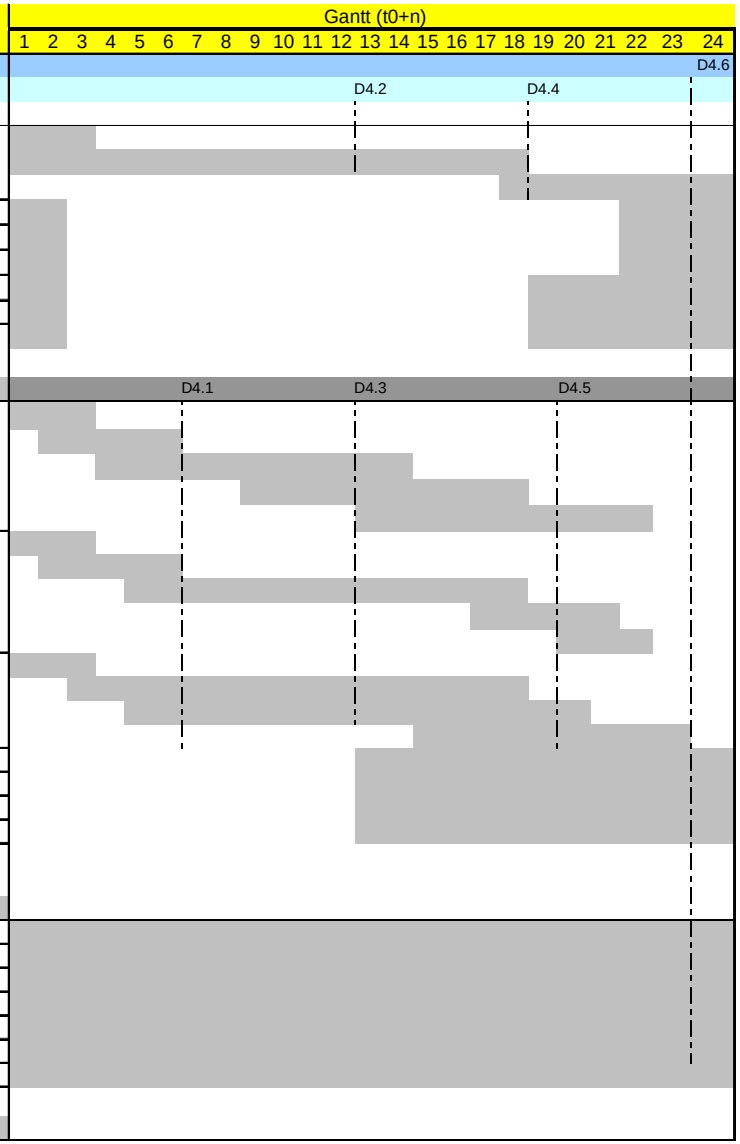
Task 4.1 planning for UPM

Activity	
1. Specifications definition	T0 - T0+3
2. Feasibility study	T0+3 - T0+12
3. Design of Type 2a receiver antenna	T0+6 - T0+9
4. Prototyping and measurement of Type 2a receiver antenna	T0+9 - T0+12
5. Design of Type 2b&3 receiver antenna	T0+12 - T0+15
6. Prototyping and measurement of Type 2a&3 receiver antenna	T0+15 - T0+18
7. Improvements in designs due to polarization diversity, or dynamic reconfiguration	T0+18 - T0+24

This activity plan has been changing according to WP4 necessities and in antenna prototyping has been advanced to provide to WP4 with antennas for the tests.

INSTINCT / WP4 ROADMAP

Who	Contribution	Total	Detail	HW	SW	Start month	End month
W4.1	**UHF Antennas and Diversity**						
UPM	External Specification		2			0	3
	Small portable antenna design and construction		21.75			0	18
	Reconfigurable antenna design	**44.75**	21			18	24
DiBcom	External Specification + Field tests	**1**	1			0	24
MSSAS	External Specification + Field tests	**1**	1			0	24
Philips	External Specification + Field tests	**1**	1			0	24
TDF	External Specification + Field tests	**2**	3			0	24
T-System	External Specification + Field tests	**2**	2			0	24
FT_RD	External Specification + Field tests	**0.5**	0.5				
total	T4.1	**52.25**					
WP4.2	**Low Power RF Front-end and Baseband**					**1**	**24**
MSSAS	External Specification		2			0	3
	Front-end architecture and dimensioning		9			1	6
	RF_IC1 design + Fabrication+validation		53			3	14
	RF_IC1 Integration / Validation with BBIC0		6			8	18
	Front-end module (RF_IC1+BB_IC1) dev. + test	**76**	6			12	22
DiBcom	External Specification		1			0	3
	Front-end architecture and dimensioning		2			1	6
	BB_IC1 demodulator design + Fab + Valid		51			4	18
	Front-end module development and test		4			17	21
	Field tests	**60**	2			20	22
Philips	External Specification		2			0	3
	RF_IC2 design + Fabrication+validation		43			2	18
	BB_IC2 demodulator design + Fab + Valid		32			4	20
	Front-end integration and validation	**86**	9			14	23
IRT	Front-end measurement	**6**	6			12	24
RAI	Front-end measurement	**2**	2			12	24
TDF	Front-end measurement	**2**	2			12	24
T-System	Front-end measurement	**3**	3			12	24
Total	T4.2	**235**	**235**				
WP4.3	**DVB-T +X**						
DiBcom		**16**	16			0	24
FTRD		**9**	9			0	24
IRT		**2**	2			0	24
MSSAS		**3**	3			0	24
Philips		**4**	4			0	24
TDF		**2**	2			0	24
Total	T4.3	**36**					
		323.25					

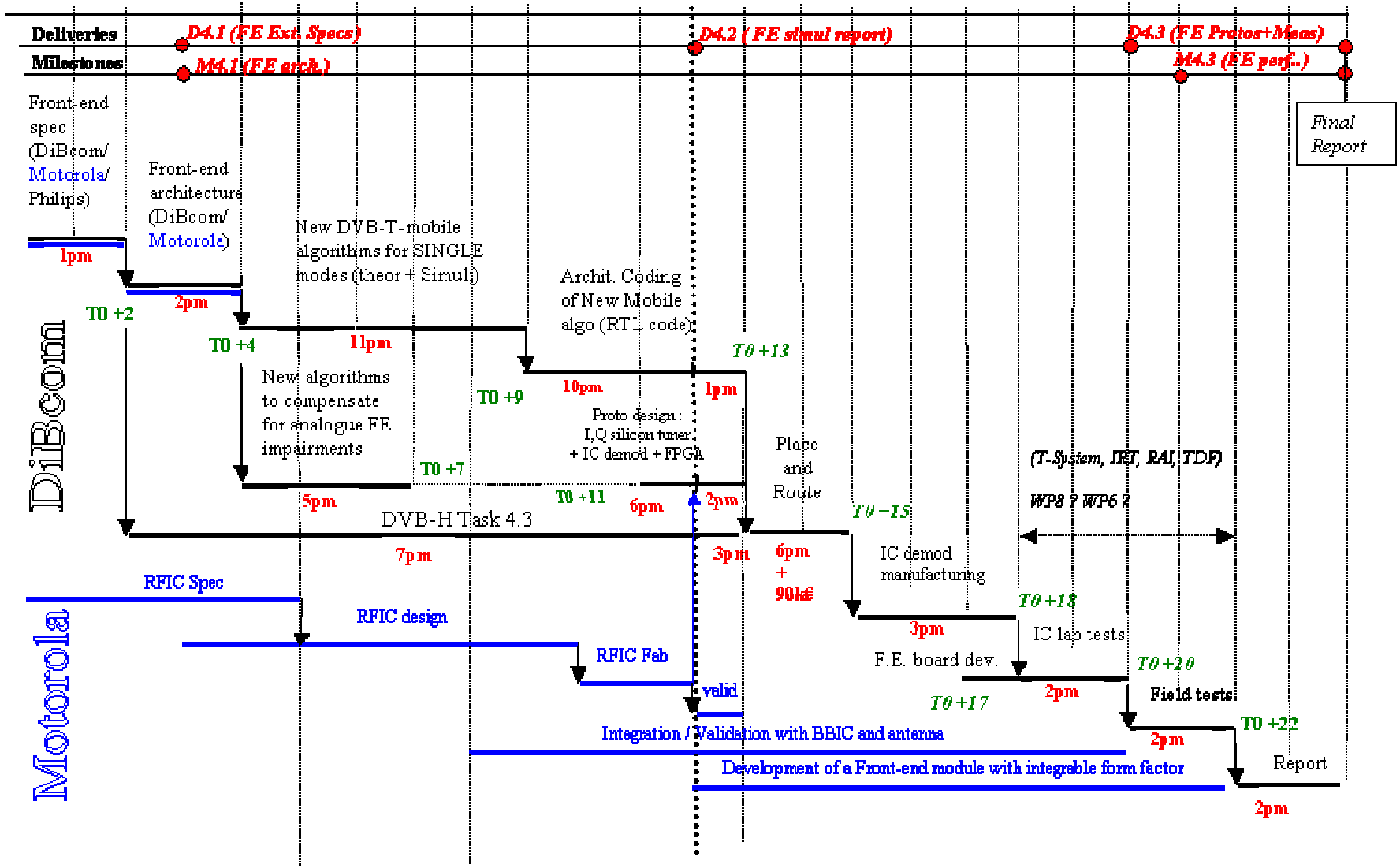


Partners contributions

Partners contributions to Tasks 4.3 and 6.4

4.3	DVB-T+/x+ receiver implementation	57	36	TDF	Testing of receivers in anechoic chamber	3	2	Cocentric
4.3	DVB-T+/x+ receiver implementation			MSPS	Impact on new standards on tuner, feedback to relevant bodies	3	3	
4.3	DVB-T+/x+ receiver implementation			Dibcom	Theoretical studies simulations and implementation of DVB-x algos	22	16	
4.3	DVB-T+/x+ receiver implementation			PS	Theoretical studies simulations and implementation of DVB-x algos, board design and validation	4	4	
4.3	DVB-T+/x+ receiver implementation			IRT	Cooperation of DVB-T and DVB-x and investigation of DVB-x for public broadcast	6	2	
4.3	DVB-T+/x+ receiver implementation			FTRD	Turbo code investigation, DVB-x lab integration and validation	19	9	
6.4	DVB-T+/x+ radio network aspects	32	49	TUBS	baseband investigations	14	12	Cocentric
6.4	DVB-T+/x+ radio network aspects			RS	Modulator and test signal generators	18	18	
6.4	DVB-T+/x+ radio network aspects			Dibcom	Theoretical studies simulations and implementation of DVB-x algos		4	
6.4	DVB-T+/x+ radio network aspects			T-systems			3	
6.4	DVB-T+/x+ radio network aspects			IRT	Cooperation of DVB-T and DVB-x and investigation of DVB-x for public broadcast		2	
6.4	DVB-T+/x+ radio network aspects			FTRD	Turbo code investigation, DVB-x lab integration and validation		10	

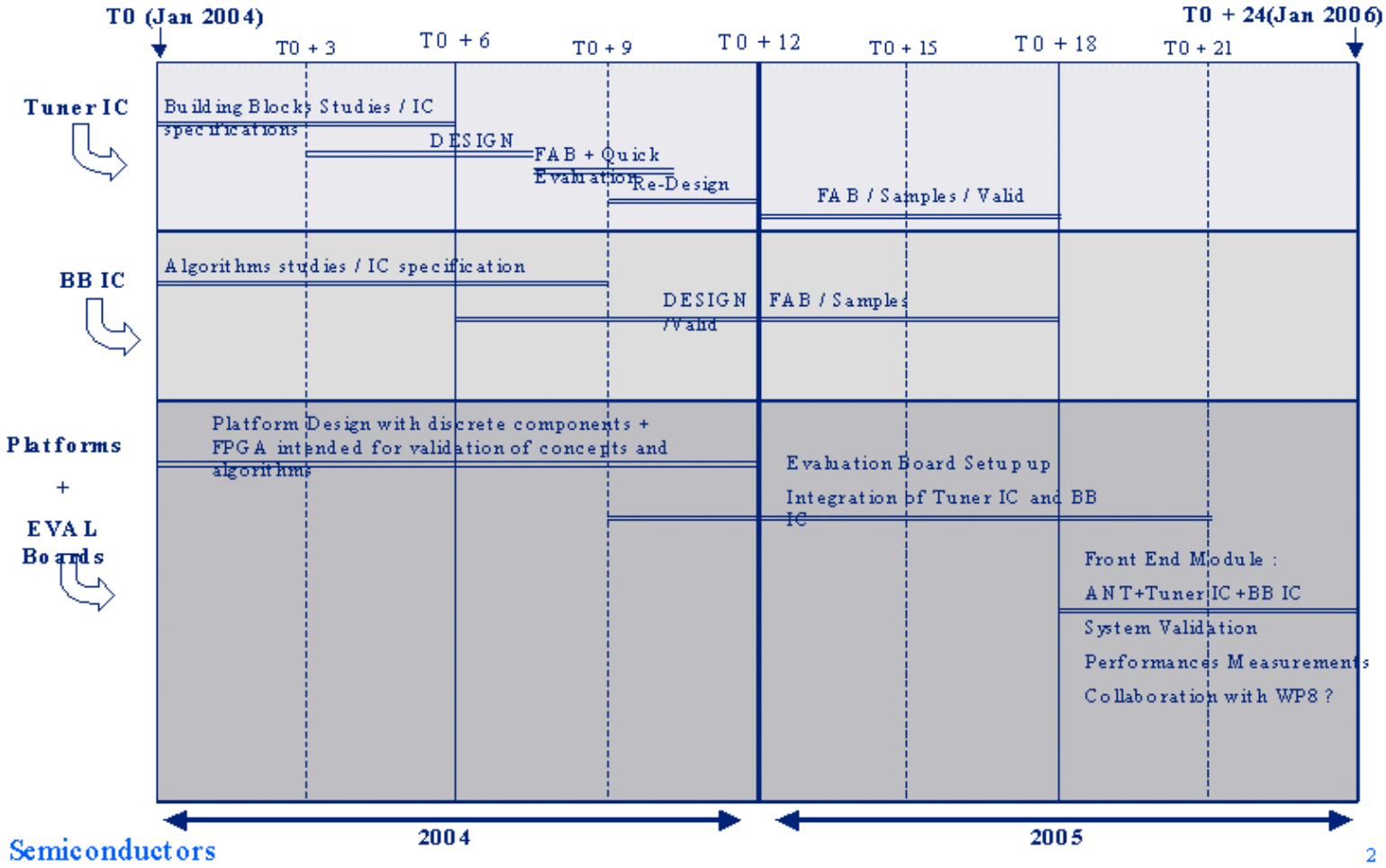
T4.2 / T4.3 Planning for MSPS/DiBcom



T4.2 Planning for Philips

PHILIPS

WP4 Objective: to Minimize Size and Power Consumption of a DVB-T Receiver preparing for DVB-H



Semiconductors

2

Milestones

Milestone Number	Date	Description of milestone
M4.1	March 2004	Architecture of front-ends and antennas
M4.2	December 2004	Antenna feasibility study
M4.3	June 2005	Performances of antenna prototypes.
M4.4	September 2005	Actual Front-ends performance, size and power consumption compared with external specification

Deliverables

Del. Number	Delivery Date	Description
D4.1	March 2004	Front-ends and antennas external specifications (Report)
D4.2	December 2004	Simulations studies on static and reconfigurable antennas and simulations results and partial tests of Front-ends (Report)
D4.3	August 2005	Static antennas and Front-ends with measurement report (Prototypes)
D4.4	December 2005	Field test measurements of front-end and antennas and recommendation for specification and measurement guidelines for DVB-T and DVB-H (Report)

Objectives

The purpose of this work package is to optimise in term of size, power consumption and cost the three main parts of DVB-T receivers, i.e. Antennas, Tuners, and Demodulator IC, in order to make them integratable in tomorrow's nomadic devices (such as convergence PDA's, smartphones and laptop computers).

Task descriptions

Task 4.1: UHF antennas and diversity – 30 pm- (led by UPM)

Antennas for DVB-T receivers depend on the terminal category being considered: to be mounted on a car, on portable (plug-free) terminal like a laptop PC, or on a handheld terminal like a PDA, or a smart phone. Moreover, depending on the terminal category polarization diversity may be useful or not.

The main goals of INSTINCT in Phase 1 are centred on portable or handheld terminals. Car terminals are not considered in INSTINCT.

Although antenna performances are related with the terminal box, within INSTINCT Phase 1, as the receiver is in development and its box shape is not definitive, the antenna design will be done to be installed on a standard laptop PC or handheld terminal, but not really integrated on them, a task which should be developed in INSTINCT phase 2.

Polarization/spatial diversity will be also included, placing several antennas on the terminal to obtain benefits from diversity techniques. However, handheld terminals will not be considered due to the low polarization discrimination actually present.

After a feasibility analysis, at least, two antenna prototypes will be developed one for a portable terminal and one for the handheld terminal. Both prototypes will be mounted on a laptop or handheld shaped metallic boxes and measured to characterize them.

Task 4.2: Low power RF front-end and baseband – 209pm- (led by DiBcom)

Within the framework of EU project "CONFLUENT" it has been proven that DVB-T robust mobile reception is possible up to 130 km/h in 8k_64QAM mode (tested in Paris) and 160 km/h in 8k_16QAM mode (tested in Berlin) at low UHF frequencies. The front-end was using a space diversity receiver equipped in a first step with a tuner "in-can" and in a second step with a "DVB-C" silicon tuner. The signal processing inside the demodulator chip was especially designed to compensate for mobile disturbance. The main goals of INSTINCT project are to decrease dramatically the power consumption of the front-end which was not completely optimised in CONFLUENT, to decrease the size of the front-end to make it in nomadic devices, to improve the signal processing in order to be able to receive the signal in portable or mobile environment even with a single antenna. The following sub-tasks are implemented:

Task 4.2.1: Front-end N°1 (MSPS Tuner + DiBcom Demodulator IC)

MSPS proposes to focus on research and development in the domain of terrestrial front-ends, to make them integrated in tomorrow's nomadic devices (such as convergence PDA's, smart-phones and laptop computers). The key factors requiring to be dramatically improved are: Form factor (sufficiently small to enable handheld or wearable devices), Power consumption (divided to allow sufficient battery life), and Cost (so that convergence technology is not limited to business users but becomes widely adopted by the European population). The work will include in Phase 1(Two first years): (1) Selection of the most suitable receiver architecture (direct conversion and zero IF or low-IF, partitioning of the system to minimize power consumption) using simulations and silicon validation, (2) Development of the analogue loops and filters, and digital algorithms required to implement this architecture with no manual alignment and a minimum of external components (and in particular filters), in cooperation with DiBcom, (3) Development of the RFIC supporting this architecture, and (4) Prototype build to validate the work and for integration with the full demonstrator developed within WP4 and WP5 and participation to WP8. In summary, Phase 1 will focus on the development of a module that can be added to a cellular terminal to enable convergence services. In Phase 2, we will study further convergence of broadcast and cellular aspects by optimising the integration in cooperation with WP5. The work will aim to develop a cost and power effective partitioning, sharing resources between the broadband side and the cellular side (memory, application processor etc.).

DiBcom proposes to focus on research and development in the domain of DVB-T / DVB-H demodulator chips, to make them embeddable in tomorrow's nomadic devices (such as convergence PDA's, smart-phones and laptop computers). The key factors requiring to be dramatically improved are: Power consumption (divided to allow sufficient battery life), Interface with silicon tuners (especially with the one developed by MSPS), and Cost (so that convergence technology is not limited to business users but gets widely adopted by the European population). The CONFLUENT project has offered the possibility to DiBcom to develop a DVB-T demodulator chip that allows receiving DVB-T even at high speeds using diversity mode.

The goal of WP4 in INSTINCT is to offer the same performance with a low power consumption single chip. The work included in Phase will be (1) External specification of the front-end module together with the other WP4 participants, (2) Front-end architecture study for optimisation of combined RF part and COFDM demodulator (DiBcom/ MSPS), (3) New DVB-T demodulation algorithms (Theoretical studies and simulations, improvement of mobile algorithms to reach high speeds in UHF bandwidths and SFN networks types (8k mode) in SINGLE mode, adjustment of algorithms to compensate (without any manual alignment) the analogue front-end implement), (4) Architecture coding (RTL code) of mobile algorithms blocks, (5) Prototype design with RF silicon tuner and mobile base-band (CONFLUENT demodulator IC + FPGA), (6) Place and route and manufacturing of low power Base-band IC demodulator integrating the new algorithms, (7) Manufacturability of the front-end (Silicon tuner + future IC demodulator), (8) Laboratory test of IC demodulator prototypes together with silicon tuners, and (9) Field tests.

o *Task 4.2.2*: Front-end N°2 (PS Tuner + PS Demodulator IC)

PS will work on both RF and base-band chips design dedicated to both mobility and low power for mobile/handheld applications. The work included in Phase 1 will be: (1) External specification of the front-end module together with the other WP4 participants, (2) Architecture study for the RF part, including front-end partitioning and development of algorithms for RF impairment compensation, (3) Design of the tuner IC (including fabrication and validation of samples), (4) Design of the low power base-band chip including coding of new algorithms for both RF impairment compensation and mobile reception (this includes, place and route, fabrication of samples, validation of samples), (5) Design of the front-end module including both RF and demodulator chips (including CAD, fabrication and assembly, integration and front-end and validation), (6) Laboratory tests of the front-end module, and (7) Field tests of the front-end module.

o *Task 4.2.3*: Lab and field test measurement

The performance of the two front-ends will be measured with test equipment specially dedicated to mobile DVB-T and the results correlated with field measurement.

Consideration of EMV-aspects for mobile receivers (e.g. pulse noise in an automotive environment) will also be taken into account. All these results might lead to recommendations for specifications and measurement guidelines.

Task 4.3: DVB-T+/H+ receiver implementation – 21 pm- (led by DiBcom)

All the services for mobile phones already exist today, except TV. One of the technological solutions is IP over DVB-H.

DVB-T presently offers 3 to 6 programs for large screens over a few Mbps. The goal of DVB-H might be to offer in addition 50 to 80 video streams for small screens over 150 to 400 kbps with in-door coverage. DVB-H aims to provide portable and mobile reception of DVB transport streams with small handheld terminals (e.g. mobile phone, smart-phone, PDA) in order to offer broadband data services to the customer in addition to the cellular mobile phone services he/she is presently used to.

Concerning terminal equipment the limiting factor is the battery usage time. Therefore developing power saving techniques is essential. Currently it is proposed in DVB-H to split the capacity of a full transmission channel between services and process only the content of the wanted service in the receiver (time slicing).

In task 4.3, the following DVB-H specific related development will be undertaken and implemented into the receiver chips (depending on final decision of DVB-H group):

- Time slicing + Power management
- Base-band input impairments compensation
- MPE-FEC
- 4K mode and de-interleaver

WP5: Terminal and Middleware aspects

Objectives

This work-package deals with the software platform and middleware aspects related to INSTINCT end-user devices. Its objectives consist of:

Specifying device profiles in accordance with reference scenarios combining DTV and 3G systems to deliver services to end-users,

Diversity of terminals will require that they be described in an exchangeable and extensible format for 1) be able to retrieve adapted content or applications from servers, 2) exchange capabilities in distributed use cases to assess compatibility, 3) assume description semantics that can be easily matched to resource requirements delivered with service descriptions.

Defining and implementing extensions and enhancements to the current DTV and 3G platforms: MHP and MIDP respectively.

Both MHP and MIDP are open applicative environments in which broadcasters and mobile operators are making significant investments. API extensions will be envisaged for 1) supporting new use cases (e.g. MHP/MIDP interworking in distributed environment), 2) supporting new content delivery means (e.g. IPDC), 3) supporting new capabilities required by the delivery nature of broadcast services (essentially for MIDP)

Building a value-added hybrid networking middleware that makes service access simple, optimised and reliable to the end user.

For simple and transparent operations in hybrid networking environment (namely DVB and 2G/3G environments), special functions need to be implemented at a level invisible from applications. This is the role of middleware. Such functions deal with horizontal handover in DVB networks, connectivity management, service discovery, storage management, etc.

The interdependences with the other work packages and tasks are depicted in Figure 5.

In order to lead to impacting results already in the first phase of the project (standards, proof-of-concept validation, etc.), the work package will build on four periods as depicted in Figure 6.

Regarding implementations, whenever possible and appropriate, the developments will build on open standards and operating systems (such as Linux).

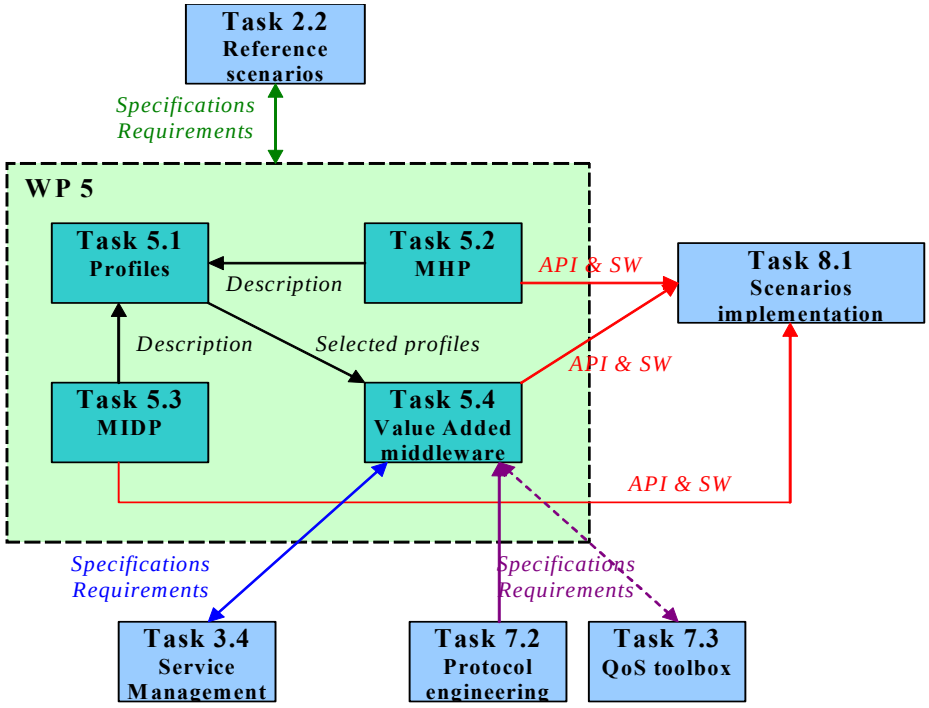


Figure 7: Interdependencies between WP5 tasks and other WPs

Strategy

Applicative platforms in (portable and handheld) terminals are a strategic topic for business reasons, but also because the need for standardization of many aspects of the terminal: applicative API's, behaviour in networks; profiles, etc.

Execution of INSTINCT project, and WP5 in particular is concurrent to the standardization process occurring in DVB (and DVB-CBMS group in particular), and OMA (BCAST work item in particular). Tasks are scheduled in such a way that this work package should both leverage from and impact these groups, tasks. Leveraging will come from the fact that a number of requirements and specifications will come from DVB-CBMS group for instance, while impact will be based on 1) the active participation of some INSTINCT partners in DVB, 2) the relatively open validation play-ground that the project offers, 3) the directions that the project can provide to DVB for future phases of the standardization process.

The relevance of WP5 work in respect of DVB and OMA will come from the fact that there will be within INSTINCT easy and open access to all the parts of the end-to-end system, hence providing sufficient understanding to INSTINCT partners of the end-to-end implications of choices made at terminal level. Building on this capability also should provide soundness to INSTINCT contributions to these bodies.

From a more technological standpoint, this work package will explore features that will provide various business case opportunities while trying to maintain the vision of a "subscriber sub-system" platform maximizing commonalities between broadcast-based and telecom-based eco-systems. This should be achieved, 1) by considering a "middleware" applicable to both MIDP and (mobile) MHP environments, 2) by extended API's for services on hybrid networks with the same classes on both environments, 3) by defining a profiling mechanism that will help in the configuration of this generic platform for proper inter-working.

One objective of this work package is also to demonstrate the achievements on actual platforms. Various platforms are considered:

- Fully featured PC (DVB-T/H + 2/3G) used as reference environment
- Fully featured tablet PC for mobility/nomadicity testing, and advanced services
- PDAs (based on Linux or WinCE) for reference environment porting on lightweight devices, and early user perception evaluation
- Mobile phone for actual applicative environment, typical form factor, etc

The exact specifications will be decided once the required developments are sufficiently known.

Planning

The work package planning starts with a definition phase where the requirements for the features to design are defined, based on inputs coming from other work packages, like WP2. Then a development phase for design and prototyping of the selected features occurs, before delivering functional platforms to WP8 while supporting the development of specific scenarios.

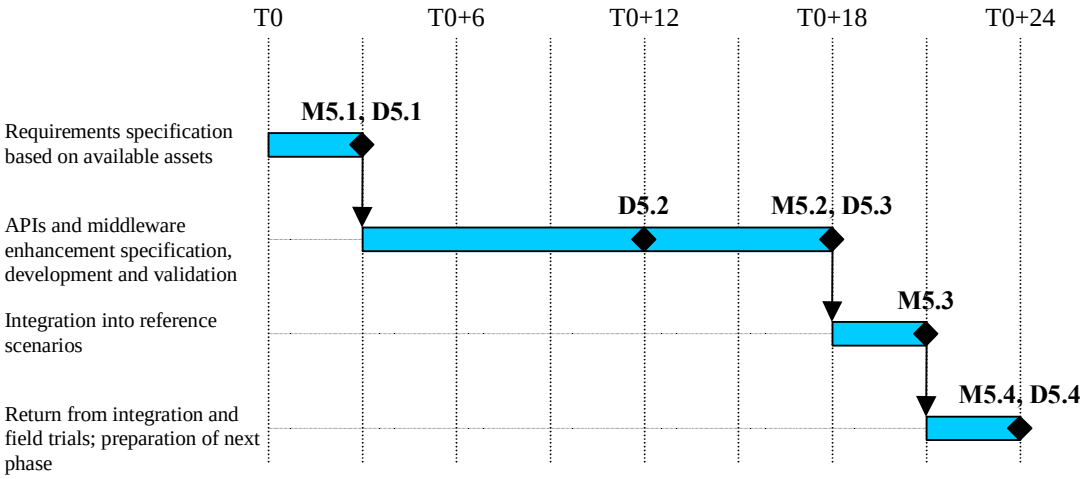


Figure 8: WP5 Planning

Milestones

Milestone Number	Date	Description of milestone
M5.1	March 05	Requirements on device API and middleware available
M5.2	June 05	API and middle ware developed / extended
M5.3	September 05	API and middleware integrated in scenarios
M5.4	December 05	Phase 2 development plans set-up based on experimentation results

Deliverables

No.	Title	Nature	Editor	Delivery Date	Description
D5.1:	Requirements on device API and middleware	Report		March 04	Identification of API extensions in MIDP and MHP for supporting INSTINCT scenarios
D5.2:	API and middleware specifications	Report		December 04	Specification and design of the support functions required for the API extensions
D5.3:	API and middleware software	Software		June 05	Implementation of the identified extensions on available platforms
D5.4:	Required enhancements to developed API and middleware	Report		December 05	Identification of additional extensions, and lessons learned from WP8 scenario development.

Task descriptions

Task 5.1 Terminal modelling and middleware

Objectives

Instantiation of terminal profiles that will allow the implementation of INSTINCT scenarios where prototype services targeted to a set of selected convergent devices (or integrated device) will be implemented.

In other words, to define a syntax, or a vocabulary based on a standard syntax (e.g., CC/PP), to describe and send a set of attributes and associated data elements between an INSTINCT client and the origin server; attributes typically describe hardware, software, network and application characteristics of the end user device, and eventually also user preferences.

Things to do

1. Collect requirements on the terminal from T3.1 for service descriptions
2. Collect requirements on the terminal from T2.2 for demo scenarios
3. Select framework for terminal profiling (e.g. CC/PP)
4. Select protocol for terminal profile exchange or update
5. Define requirements for terminal profile exchange or update
6. Extend selected framework for INSTINCT terminal profiling:
    a. Broadcast-related aspects
    b. Telco-related aspects
7. Instantiate the syntax for the selected terminal profiles to be demonstrated

Expected outputs

- Contribution for M5.1 (M3):
  - Requirements for terminal profile exchange or update. However it will not be possible to identify terminal requirements (in terms of profile exchange or update) until we have defined which structure to adopt (e.g., CC/PP) and which protocol to use. By M3 these requirements will be expressed in general terms. The requirements will be refined by M9.
  - Inputs collected by T3.1 (service descriptions)
  - Inputs collected by T2.2 (reference scenarios)
- Contribution to D5.2 (M12):
  - Syntax for terminal profiling with specific profiles instantiated for the terminals to be demonstrated in the project
  - Selection of protocol for profile exchange/update.

Expected issues

- The task should decide what kind of devices should be addressed, mainly distinguishing between integrated MHP/MIDP devices and interacting MHP/MIDP devices. In the case of scenarios using multiple interacting devices, there could be an issue of combining different profiles to fit into a customised service?
- There could be an issue of considering dynamic profiles, changing based on the network availability; if this will be considered in the project, then there might be connections with WP7

Outputs from each partner

Partner	Effort	Expected output
IRT	3	*Profile for free-to-air reception, including privacy aspects* Scenarios for IP tuner Privacy aspects
Brunel	4	*Description of the terminal for purposes of negotiation of service consumption and integration within the terminal architecture* SAVANT (service profiles)
MLABS	1	*Terminal profile definition* Device profile aspects related to the description of the terminal connectivity
NETikos	4	*Analysis and definition of the requirements and constraints of the "low-end" mobile terminals for converged services.* Definition of the terminal profile (telco attributes)

Partner	Effort	Expected output
MPCS	4	*Detailed definition of terminal profiles*
CESAR	4	Define requirements for terminal profile exchange or update
GENIUS	7.2	*Definition of terminal profile and extension of selected framework* Definition of the terminal profile (all attributes) Device profiling through framework extension
CERTI	5.2	Terminal requirements analysis focusing on Brazilian reality. Terminal requirements examination and classification based on deliverable 2.1 of Task 2.2 (Reference Scenarios).

Table 5 Contributions per partner

Time plan

Things to do	When	Participating partners	Leading partner	Output to
T1 – Collect requirements on the terminal from T3.1 for service descriptions	29/02/04	NETikos, Motorola	NETikos	M5.1
T2 - Collect requirements on the terminal from T2.2 for demo scenarios	29/02/04	NETikos, Motorola	NETikos	M5.1
T3 – Select framework for terminal profiling (e.g., CC/PP)	25/03/04	ALL	-	M5.1
T4 – Select protocol for terminal profile exchange or update	30/09/04	ALL	CERTI	D5.2
T5 - Define requirements for terminal profile exchange or update	25/03/04 + 30/09/04	ALL	CESAR	M5.1+ D5.2
T6.A – Extend selected framework for INSTINCT terminal profiling (Broadcast-related aspects)	30/09/04	Brunel , GENIUS, IRT	IRT	D5.2
T6.B - Extend selected framework for INSTINCT terminal profiling (Telco-related aspects)	30/09/04	ALL but IRT	GENIUS	D5.2
T7 - Instantiate the syntax for the selected terminal/user profiles to be demonstrated	30/12/04	ALL	MPCS	D5.2

Table 6 Task 5.1 time plan

Task 5.2 MHP aspects

Objectives

Extensions to MHP in order to support (peer-to-peer) interaction with MHP and MIDP devices, for example:

Support for JSR82 (Bluetooth)

All-IP connection (IP tuner OR/AND IPDC tuner)

MHP as gateway and/or e.g. link to OSGi framework

Support for the development of an MHP-based demonstrator for INSTINCT:

Demonstrator selection based on scenario (e.g. Helga):

Mobile PDA-like device

Laptop-like device

MHP implementation for that mobile device

Application development support:

Application skins

Portable Content Format (PCF) discussion as possible solution for Instinct

Things to do

1. Definition of HW/SW stack for demonstration
   A. Selection of a demonstrator platform
   B. Implementation of MHP for that device
   C. Implementation of extensions for device connection between MHP and MIDP
2. Connection between the generic IPDC stack (Value added middleware) and the MHP
3. Connect an IP-Tuner to MHP.

- For the points two and three implementations may be necessary for mobile target device (e.g. PDA).
- There should be a combining architecture for IPDC and IP-Tuner (as far as possible).

Expected outputs

- Contribution to D5.1 - requirements on device API and middleware (Report) (M3):
  - In-depth description of MHP specification
  - Comparison between MHP and MIDP
  - Scenario description of MHP terminal interaction
- Contribution to D5.2 (T0+12) API and middleware specifications (Report):
- Contributions to D5.3: (T0+18) API and middleware software (Prototypes)
- Contributions to D5.4: (T0+24) Enhancements to APIs and middleware (Report)
- Demonstration platform based on scenario with IP-Tuner and/or IPDC and MHP software stack

Expected issues

- WP3 UI issues have impacts mainly on 5.2
- Clarification whether Task 5.1 also defines the terminal profiles for MHP. That, probably makes sense for IP Datacast, but not for pure MHP broadcast applications
- Demonstrator-Laptop: Project aims for a Linux/laptop-based MHP demonstrator. But currently there is no Linux-MHP from project-partners available, however that will change end of 2004.
- Demonstrator-PDA: Partly MHP implementation on PDA will be available, but needs to be defined more exactly. Maybe sub-setting is needed.
- The availability of a MHP reference implementation is a fundamental condition to pursue the tasks described in WP 5.2.

Outputs from each partner

Partner	Effort	Expected output
IRT	11	• MHP expertise • MHP software extensions for reference scenarios • Development of IP Tuner interface for MHP (MPEG-TS over IP), (scanning IP networks from all networks, whether GPRS or DVB) • Get inputs from DVB-IPI (?) • EPG for IP services
Brunel	3	• Evolution of MHP with respect to local storage, gateways, user interfaces, downloadable services, events generated by users • Seamless generation of graphical user interfaces for MHP
RBB	2	• Requirements for integration of MHP into mobile environment
TU-BS	18	• Extension of MHP (e.g. BT, location based services, transfer content to mobile phones) to allow support for the INSTINCT reference scenarios • Analysis of technical feasibility of MHP on mobile devices (e.g. PDA) • Test implementation of MHP on mobile device (e.g. PDA)
CESAR	7	• MHP description and analysis • Implement MHP player to the UI specification
Genius	18.2	• MHP-over-IP implementation • Analysis of technical feasibility of MHP on mobile devices • MHP Test implementation on mobile device • Abstraction layer for MHP with respect to the available return channel

Table 6 Contributions per partner

Time plan

Things to do	When	Participating partners	Leading partner	Output to
MHP description and analysis		Cesar/ TU-BS/IRT	CESAR	D5.1
Develop stack for IP-Tuner	30/06/05	IRT	IRT	D5.3
Feasibility study of MHP on mobile device	31/12/04	TU-BS, Genius	TU-BS	D5.2
MHP test implementation on PDA	30/06/05	TU-BS, Genius	TU-BS	D5.3
MHP over IP test implementation	30/06/05	Genius	Genius	D5.3

Table 7 Task 5.2 Timeplan

Task 5.3MIDP aspects

Objectives

- Specification and development of middleware and user interface API enabling DVB contents to be handled on the UE mobile platform
- Extensions to MIDP in order to support IPDC protocol stack and (peer-to-peer) interaction with MHP:
  - IPDC protocol stack services for applications
  - Storage management
  - Distributed application download

Things to do

- In-depth description of MIDP specification
- Interactions with MHP
- A760 apps processor description, with capabilities and limitations.
- JSR 82 development
- Upper layer software architecture to control (integrated) DVB Module
  - Open flow, control flow, direct flow
  - Definition of resulting extensions to MIDP
- Enhanced User Interfaces
  - Formatting adapted to broadcast-based content
  - Management of graphical/display resources
  - Definition of resulting extensions to MIDP
  - UI developments and tests
- Standardisation of new MIDP extensions
- Implementation of a MIDP-based One Time Password authentication mechanism

Expected outputs

- Contribution to D5.1 - requirements on device API and middleware (Report) (M3):
  - Description of MIDP specification
  - Comparison between MHP and MIDP
  - Scenario description of MIDP terminal interaction
- Contribution to D5.2 (T0+12) API and middleware specifications (Report):
- Contributions to D5.3: (T0+18) API and middleware software (Prototypes)
- Contributions to D5.4: (T0+24) Enhancements to APIs and middleware (Report)

Expected issues

- Clarify the necessity of MIDP. Is it the best solution? Is MHP not a better one?
- There will be no handset with an integrated DVB tuner for the demo. A distributed architecture communicating via an IP connection over Bluetooth is being studied.
- The handset that will be used for the demo may not support video streaming capabilities. The impact of porting this capability on the available platform is on-going.

Outputs from each partner

Partner	Effort	Expected output
Netikos	15	• Contribute to the analysis and definition of the MIDP-based interface between an MHP-compliant and a MIDP-compliant device • Analysis and implementation of an authentication mechanism (both client and server will be implemented)
Brunel	2	• Determine how an API can be used to interact with MHP to develop application software for converged DVB broadcast and cellular services. • Determine how devices that require thin clients (e.g. PDAs) can use this API to receive subset of a full set of a DVB-T service
MPCS	24	• Make an expert report on the EzX platform • Specification and development of middleware and user interface API enabling DVB contents to be handled on the UE mobile platform

Partner	Effort	Expected output
CESAR	15.75	• MIDP description and analysis • Implement MIDP player to the UI specification • Application management, ESG, UI (architecture, implementation & test suites) • Communications (test suites)
Genius	18,2	• Implementation of MHP-to-MIDP Bridge API, including device profiling through components download and update • Specification of Skinning API

Table 8 Contributions per partner

Time plan

Things to do	When	Participating partners	Leading partner	Output to
Status on MIDP capabilities *vs* MHP		CESAR, MPCS	CESAR	D5.1
Status on the terminal platform capabilities/limitations	15/04/04	MPCS	MPCS	D5.1
Specification of the required extensions to MIDP/CLDC	15/04/04	**MPCS, NETIKOS, CESAR, GENIUS**	MPCS	D5.1
Design of the the required extensions to MIDP/CLDC	31/12/04	MPCS, Netikos, CESAR, Genius	MPCS	D5.2
Implementation and validation of the MIDP/CLDC extensions	30/06/05	MPCS, CESAR, Genius	MPCS	D5.3
Interaction MIDP/MHP	30/06/05	Cesar /MPCS/Netikos/ Brunel/Genius	MPCS	D5.2

Table 9 Task 5.3 timeplan

Task 5.4 Value-added hybrid middleware

Objectives

This task will provide the specification and the implementation of a value-added hybrid middleware that is in charge of:

- Retrieving, storing and updating all the IP based content that is available over a DVB-T/H link. This includes content files (images, web pages…), content associated metadata (MPEG7, etc.), service metadata or any IP based signalling information.
- Defines a middleware API that will be made available to the implementation of MIDP and MHP APIs.

Providing an interworking mechanism using Bluetooth between a DVB receiver and a device implementing the above-mentioned middleware API.

Things to do

Objectives	Leading partner	Liaisons
Retrieves IP data from the DVB stream ➔ Work still to be done for an MIDP based platform (connectivity module)	MPCS	
Retrieves and manages sessions information. ➔ Definition of mechanisms and session signaling for managing sessions	MOTLABS	WP3.3
Tracks and stores IP based service descriptions ➔ Related to the provided service		WP3.3
Tracks and stores pushed content (files) ➔ Selects transport protocols ➔ Use of platforms storage management implementations (MHP and MIDP)	MOTLABS GENIUS	WP3.3
Specify and implement extensions to provide the common Middleware API	GENIUS	WP5.2, 5.3
Manages interactions between parts of a distributed terminal	MPCS	
Interaction with the service management entities (session level authentication, reporting for statistics, service portal)		WP3.3
QoS monitoring (Service level and Session level)		WP7

Expected outputs

- Contributions to deliverables:
  - Contribution to D5.1 - requirements on device API and middleware (Report)
  - Contribution to D5.2 (T0+12) API and middleware specifications (Report)
  - Contributions to D5.3: (T0+18) API and middleware software (Prototypes)
  - Contributions to D5.4: (T0+24) Enhancements to APIs and middleware (Report)
- Recommendations to WP3.3 on the protocols and mechanisms between the terminal and the Service management located in the network.

Expected issues

- Who will develop MHP implementations
- Strong interaction with WP3, mainly on service descriptions
- To assure a MHP with open source code available for partners. This should be seen as a precondition for the feasibility of all project
- Limitations of available devices.

Outputs from each partner

Partner	Effort	Expected output
MPCS	36	Specification and development of an interworking mechanism and connectivity software module between a mobile phone and an external version and an integrated version of the DVB receiver.
GENIUS	17,2	Specification and development of an IP metadata management middleware
MOTLABS	15	Specification and development of a Middleware for the management of pushed content and delivery sessions, available from a DVB stream (IPDC stack)
CESAR	10.3	Specification and development of a Middleware for Service Schedule and Subscription

Table 10 Contributions per partner

Time plan

Things to do	When	Participating partners	Leading partner	Output to
Specification of the added-value middleware		Genius	Motlabs	D5.2
Middleware API definition	31/12/2004	,Motlabs		D5.2
Metadata management API specification	31/12/2004	Genius	Genius	D5.2
API implementation and test	31/12/2005	Motlabs		D5.4
Metadata management API implementation and test	31/12/2005	Genius	Genius	D5.4

Table 11 Task 5.2 time plan

WP6: Radio network aspects

Objectives

WP6 objective is the development of a cellular model for co-localised DVB-T/H and telecom network. This type of network shall use mobile network topologies in order to offer an equivalent granularity towards end users. This workpackage is organised into four (4) different tasks:

- First task is the description of current environmental Broadcast network topologies based on an exhaustive analysis of spectrum resource. This task starts with the analysis of analogue and digital TV networks. This task will issue recommendations on cellular model to be used and the different potential gain of DVBT/H and implementation solution for mobile reception
- Second task: - In order to cope with new telecom needs in the field of bitrates, number of users per cell, backbone network, EMC environment, the DVB-T /H transmitter architecture needs to be reviewed, adapted and cost optimised.
- Third Task: - In order to be able to optimise co-localised network, radiated power shall be limited to the actual recommendation of telco's specifications. A professional DVB/T/H receiver will allow to optimise the compromise between QoS and coverage area.
- Fourth Task: - Specific analysis and simulation shall be carried out on DVB/H standard. The aim of this task is to provide to workpackage 4 reference simulation of DVB/H performances

Connections towards other workpackages are depicted in the figure below.

These are mainly:

Needs Backbone recommendation from WP7

Needs inputs from Service management WP3

Provide WP8 with a Low power prototype of task 6.2

Provide WP8 with a Professional receiver of task 6.3

Needs reference scenarios and system architecture from WP2 for designing Transmitter and network dimensioning

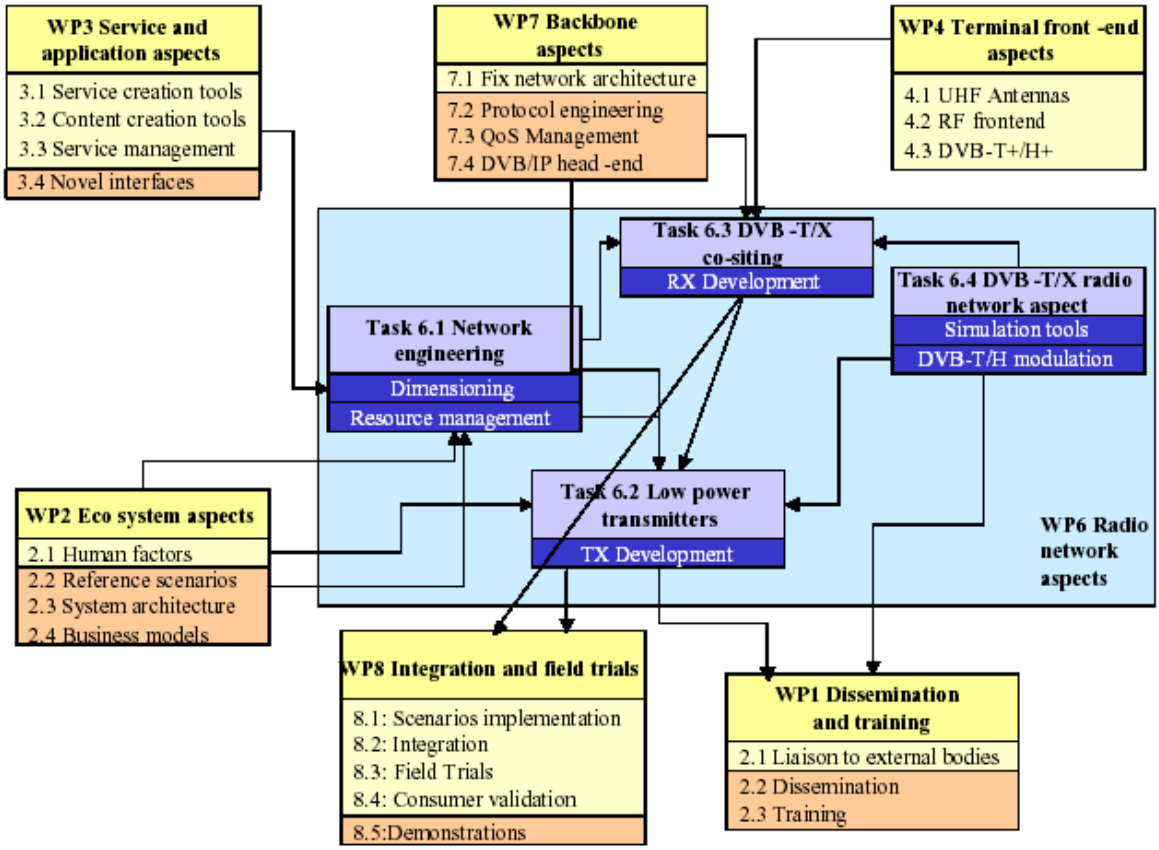


Figure 9: Interdependencies between WP6 and other workpackages

Strategy

Radio network engineering will start with the analysis of the state of the art digital and analogue Broadcast network. Once, reference scenarios and service management will be available, the work on dimensioning and resource management can start. Implementation guidelines and recommendation will follow and will be a pre-requisite for the final specification of transmitter parameterisation.

The development of low power transmitter can start at the very beginning of the project but leaving opened network data interface, environment constraints. It has been agreed in the technical annex that a sectored architecture will be used. One sectored cell will be validated during the first phase of the project. The tri-sectored architecture will be investigated during the second phase of the project. An interaction with system architecture is required to define precisely how to interconnect Broadcast type network and telco's type networks (SDH/ATM network). Once, recommendation on cell size will be issued, a first definition of TX will be issued.

For qualification purposes of new low power transmitter, of realistic coverage area frequency planning, of QoS requirement, of INSTINCT laboratory transmission chain, of INSTINCT field trials, a professional DVB-T/H measurement receiver will be defined and developed.

The DVB-T/H simulated performance (expected ERP for DVB-H, expected bit rates, how to optimise sectored cells, network topology SFN, MFN, etc., or resource management) needs to provide reference performance to WP4. This work is also in relation with the Eco system aspects topics and the service aspects.

Planning

The proposed planning of the workpackage effort is shown in Table 12:

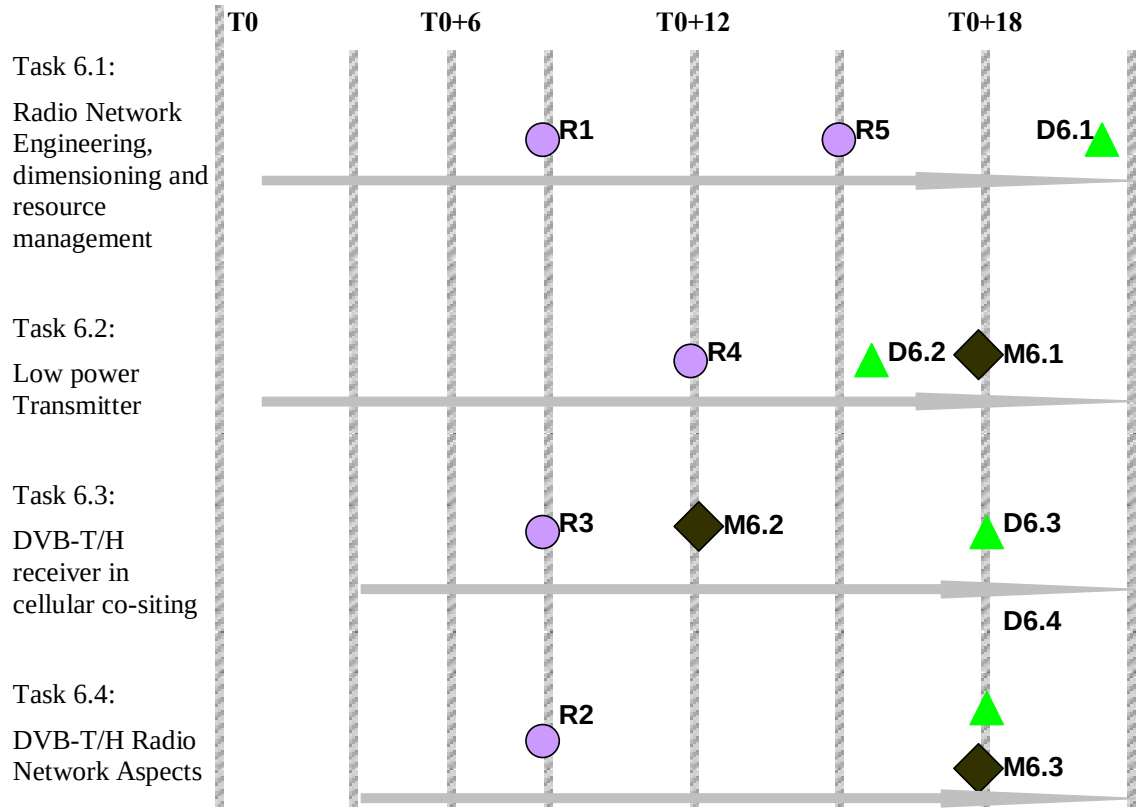


Table 12 WP6 Planning

Milestones

As described into the INSTINCT project, the WP6 milestones are as follows:

Milestone number	Date	Milestone description
M6.1	Months 18	Test of low power transmitter
M6.2	Months 12	Test of the reference receiver
M6.3	Months 18	DVB-T/H simulation chain

In WP6, tasks 6.1 & 6.2 start at the beginning of the project by reviewing the existing network topology constraints and the low power transmitter technology in regards to the DVB-H standard.

Task 6.3 & 6.4, start at T0+3 due to the potential evolution of the DVB-H standard.

The deliverable D7.1 (Fix network architecture description) coming from WP7 (already planned at To+9), preliminary Radio Network Engineering overview of spectrum usage (R1) and preliminary evaluation of DVB-H standard performance (R2) are absolutely needed for finalising the transmitter specification (R4).

A professional receiver specification (R3) will also be issued at T0+9.

At T0+15, the other output of the task 6.1 shall deliver a preliminary implementation guideline (R5) as input for workpackage WP8 (Integration and field trials).

Deliverables

No.	Title	Nature	Editor	Delivery	Description
R1	Report on state of the art spectrum usage	(Preliminary Report)	Brunel	Month 9	Comprehensive analysis of state of the art analogue and digital TV spectrum usage
R2	Intermediate evaluation of standard performance	(Preliminary Report)	FTR&D	Month 9	Preliminary Report on expected performance of DVB-H and definition of DVB-H tests
R3	Specification of professional DVB-H receiver	(Preliminary Report)	R&S	Month 9	Specification of professional DVB-H receiver
R4	Preliminary specification of low power transmitter	(Preliminary Report)	Thales B&M	**MONTH 12**	Specification of low power transmitter with sectored architecture
D6.2	Very Low power transmitter	Prototype	Thales B&M	Month 16	Demonstrator of very low power transmitter
R5	Implementation guidelines	(Preliminary Report)	Brunel	Month 18	Synthesis of spectrum usage guidelines, resource management and network dimensioning
D6.3	Measurement receiver for DVB-T/ H signals	Prototype	R&S	Month 18	Demonstrator of measurement receiver for DVB-T/H signals
D6.4	Impact of DVB-H deployment within DVB-T context	(Report)	FTR&D	Month 18	Implementation guidelines of standard performances and impact of identified options
D6.1	Radio spectrum, traffic engineering and resource management	(Report)	Brunel	Month 20	Synthesis of spectrum usage guidelines, resource management and network dimensioning

Task description

Task 6.1: Radio network engineering, dimensioning and resource management (led by Brunel)

Co-working of 2G/3G/4G telecom networks and Broadcast networks on the same site is a critical issue that needs to be addressed to cut down on roll out expenses of future services and networks. This subject will be studied from both theoretical and practical perspectives, to offer mathematical models as well as recommendations derived from field test observations. Such effort will contribute to provide "low cost access network equipment" and ensure "multi-service capability" of the sites resulting in a "reduction in capital and operational expenditure for installation and maintenance".

Recommendations will be made for the design and testing of co-working of Broadcast and telecom equipment at both transmission & reception sites. The partners will provide methods and results for radio network engineering and dimensioning aspects.

From the present state-of-the-art planning processes and regulatory aspects, the following will be addressed:

Description of the spectrum use for analogue TV,

Description of the theoretical DVB-T network dimensioning

Description of frequency planning in the real world and during the simulcast period

Possible scenarios for analogue networks switch off

Densification of networks that are not dedicated to reception in mobility

Identification of rules for "cellularised" DVB-T/H planning (ERP, Reuse pattern, etc.)

Related spectrum demands

Coverage comparison in defined scenarios

Impact of diversity receivers on spectrum planning

Expected results

Contribution to R1 (M9)

Contribution to R5 (M18)

Contribution to D6.1 (M20)

Synthesis table of partner's effort in this task

Partner identification	Effort
BRUNEL	9
FTR&D	3
IRT	3
TDF	9
T-SYSTEM	4
R&S	2

Schedule

Sub-task	Deadline	Participating Partners	Leading Partner	Output to
Preliminary report R1	30 Sep 2004	Brunel, FTR&D, IRT, TDF,T-System, R&S	Brunel	D6.1
Preliminary report R5	30 June 2005	Brunel, FTR&D, IRT, TDF,T-System, R&S	Brunel	D6.1
Final document D6.1	31 August 2005	Brunel, FTR&D, IRT, TDF,T-System, R&S	Brunel	D6.1

Task 6.2: Low power complexity transmitter (led by TBM)

To match low power broadcasting cells requirements, the appropriate protection ratio and isolation between all the co-localised DVB-T, DVB-H, Analogue TV transmitters and GSM / UMTS base stations will be derived from recommendations of task 6.1, task 6.4 and of WP7 backbone aspect.

A new generation of dedicated small power transmitters for one sectored cell application will be designed during the phase 1 of the INSTINCT project.

The tri-sectored cell transmission aspect will be postponed to the phase 2 of the INSTINCT project for allocating the time in phase 1 to concentrate the validation and field trials effort on one cell operation, to give the best performance results in co-siting operation and to examine the possible frequency resource aspects.

Two DVB-H INSTINCT transmitters will be issued as deliverables D6.2 and will provide a determined power (100W rms. max) compatible with the power requirement of the French field trials platform (managed by TDF) and also of the Brazilian test platform.

Moreover, the capability to insert local data will be taken into account in order to optimise both the performance of the cell but also to reduce drastically the price of

such equipment.

Expected results

- Contribution to R4 (M12)
- Contribution to D6.2 (M16)

Synthesis table of partner's effort in this task

Partner identification	Effort
THALES B&M	44

Schedule

Sub-task	Deadline	Participating Partners	Leading Partner	Output to
Preliminary specification R4	31 Dec 2004	Thales B&M	Thales B&M	D6.2
Final deliverable D6.2	30 April 2005	Thales B&M	Thales B&M	D6.2

Task 6.3: DVB-T/H measurement receiver in cellular co-siting environment led by R&S

A measurement receiver for DVB-H signals will be developed as needed for system tests and future installations of DVB-H networks. The receiver will be interfaced to protocol analysers, and will allow to have a reference tool which can measure the Quality of service in each cells in the shadow areas and / or at the border of the coverage area.

New solutions for reception of DVB-T/H signals carrying mainly IP data will also be developed. This includes the interfacing to protocol analysers for the various protocol layers.

Using the measurement receiver analysis of service distribution, traffic density analysis and QoS requirements of co-operating networks will be performed.

Expected results

- Contribution to R3 (M9)
- Contribution to D6.3 (M18)

Synthesis table of partner's effort in this task

Partner identification	Effort
BRUNEL	4
IRT	3
TDF	2
THALES B&M	4
R&S	18

Schedule

Sub-task	Deadline	Participating Partners	Leading Partner	Output to
Preliminary Specification R3	30 Sep 2004	Brunel, IRT, R&S, TDF, Thales B&M,	R&S	D6.3
Final deliverable D6.3	30 June 2005	Brunel, IRT, R&S, TDF, Thales B&M,	R&S	D6.3

Task 6.4: DVB-T/H radio network aspects led (by FTR&D)

This task will constitute a first step for validation of technologies and options chosen by DVB-H ad hoc standardisation group for defining a new DVB physical layer standard (initially due in June 2003 and finalised in January 2004).

Elaborating on targeted frequency bands and associated dedicated mobile channel models will be required as a first step towards handset integration of the new standard. Then the criteria for technology assessment, using software simulations and theoretical evaluations (targeted bit error rate, complexity, compatibility or evolution path for existing DVB-T infrastructure, etc.) will need to be defined according to the foreseen broadcast network configurations. Finally the standard will be evaluated and a final report on expected standard performances and impact of identified options produced.

This task will have to liase strongly with WP4 in order to approve the results of laboratory or possibly field validation of designs produced by INSTINCT WP4.

It is so far foreseen that the work in Phase 1 will include:

(1) Theoretical performance evaluation and validation of the DVB-H standard (simulations, DVB-H optimisation, investigation on time-slicing and MPE-FEC impact).

(2) Definition of new test conditions (incl. Radio channel simulation) and criteria (BER, PER, etc.) for DVB-H (and possibly lab. test bed architecture).

Expected results

- Contribution to R2 (M9)
- Contribution to D6.4 (M18)

Synthesis table of partner's effort in this task

Partner identification	Effort
FTR&D	14.5
IRT	2
R&S	6
T-SYSTEM	2

Schedule

Sub-task	Deadline	Participating Partners	Leading Partner	Output to
Preliminary Report R2	30 Sep 2004	FTR&D, IRT, R&S, T-System	FTR&D	D6.4
Final document D6.4	30 June 2005	FTR&D, IRT, R&S, T-System	FTR&D	D6.4

WP7: Backbone aspects

Objectives

WP7 aims at defining and setting up the appropriate infrastructure for the fixed part of the demonstration network architecture.

The aim of WP7 is to:

- Define and set up the fixed support infrastructure that the other WPs in the project need for their development work, validation and testing, as well as demonstrations and field trials.

  The definition starts with identifying the logical and physical interfaces to the components defined and developed in other workpackages. In the architectural model, WP7 is located between WP3 and WP6. Thus, interfaces need specified with both WPs. Over these interfaces the contents and applications are requested and delivered, and the communication between QoS management sub-systems takes place.

- Identify, specify, develop and validate the missing components that are needed to set up the INSTINCT system for verification and demonstration.

  This includes the identification, testing and integration of existing components, especially for the proprietary sub-networks that may be used during the demonstrations. It also involves the development work to provide new tools and components which allow for the usage of new transmission standards such as DVB-H, the support of IPv6, and the implementation of QoS test probes at the edge of each sub-network.

- Identify and specify, through interactions and work with the Brazilian partners, specific needs for the backbone infrastructure in Brazil.

- Identify and characterise specific issues of architectures, protocols and systems that, if properly evaluated and defined, will facilitate and even enable the deployment of the INSTINCT concepts in Brazil and Latin America.

Interdependencies with the other WPs are illustrated in the figure below.

The major items are:

- Interface specification together with WP3 to enable the backbone infrastructure to take the services created by WP3 and transport them to the interfaces which were defined together with WP6.

- Consideration of the requirements and constraints that stem from WP5, especially Task 5.4 'Value-added middleware'.

- Matching the WP7 sub-systems to the architecture as defined in WP8.

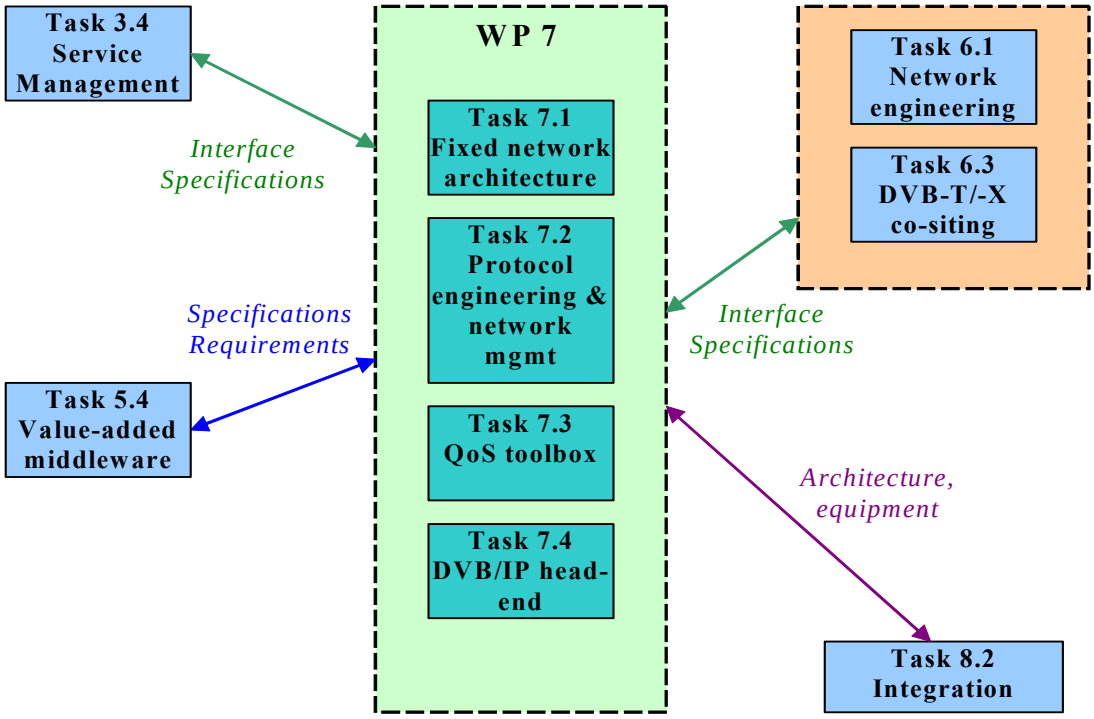


Figure 10: Interdependencies between WP7 and other WPs

Strategy

The main purpose of the sub-systems that will be provided in WP7, is the delivery of the services created and aggregated in WP3 to the radio networks provided in WP6. For this purpose, WP7 makes use of existing networks. These are standard Telco networks, including SDH/ ATM links, the 'Primary Distribution' networks as used by broadcasters to deliver their content to their transmitter stations (typically SDH/ ATM as well), and the core networks of mobile network operators (MNO) that are normally IP-based.

All these sub-networks exist and will either be used as they are currently deployed or with modifications to accommodate specific requirements from the project. For demonstrations and trials, the project partners will be in the role of end-users and thus have no or very restricted access to information from network components.

The definition of the fixed network architecture needs to be sufficiently general, in the sense that such a systems should be potentially able to reach a great number of end-users, and it should be exploitable without fundamental changes.

The QoS monitoring and management mechanisms in the area of WP7 need therefore concentrate on the evaluation of QoS at the boundaries of the sub-networks which are considered as black boxes in a first approach. The measurement results at the input and at the output of the sub-network can be compared and conclusions and subsequent actions can be derived from this information.

The actions can also be done based on more detailed information about the networks and system servers involved in the service. This led to the conclusion that integration between Network and System Management can result in more efficient actions. This is a feature that is not necessary in the demonstration scenarios that are controlled environments. The SLA Management functions in the delivery systems will use information from the QoS Management System and from this integrated Network and System Management to deal to ensure adherence to the SLAs.

The interconnections of QoS management sub-systems will be set up using standard interfaces, and a collaboration with other projects (Enthrone) is planned to establish a joint approach for an interdomain QoS management system.

The participation strategy of the Brazilian partners in WP7 is:

- Definition of end-to-end QoS control architecture and technologies for a heterogenous convergent network.
- Definition of an Integrated Convergent Network and System Management Solution for INSTINCT.
- Definition of Specific Issues of INSTINCT backbone aspects (general and demo architectures) for the Brazilian environment.
- Provision of information for the proper implementation and function of the evaluation tool that will be developed in Task 7.5.
- Evaluate necessary efforts for INSTINCT implementation in Brazil.

In the specific case of the DVB/IP head-end for mobile, and the Brazilian partners will provide the information for the European team to consider what is needed in the specification step of the project for implementation in Brazil.

Planning

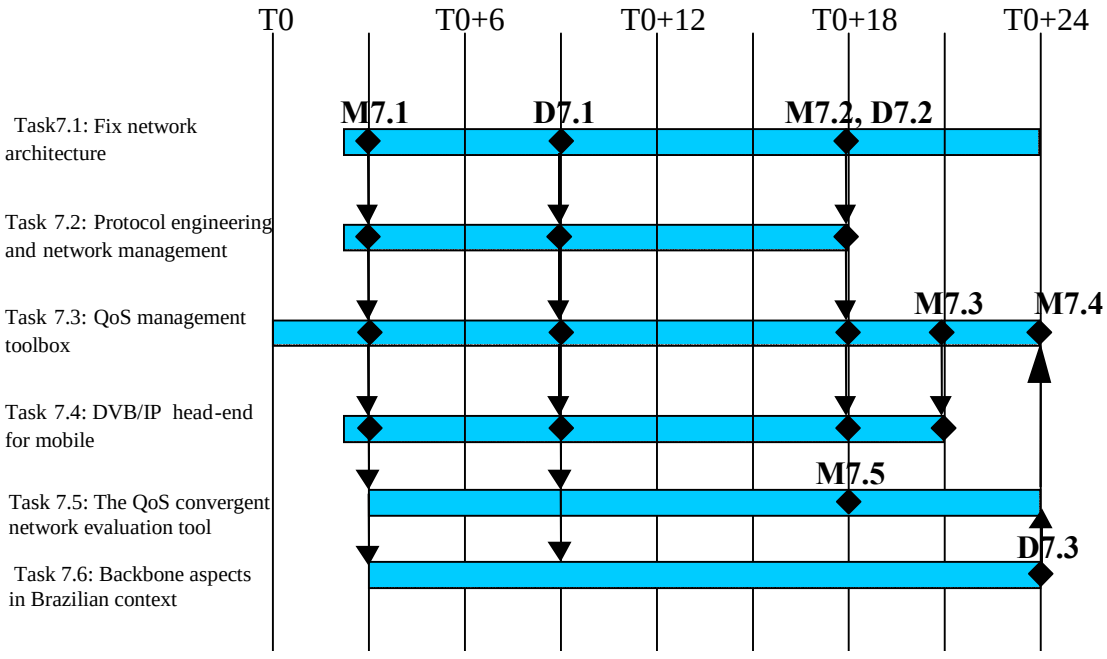


Figure 11: WP7 schedule

In WP7, the Tasks 7.1, 7.2, 7.4, 7.5 and 7.6 started in Month 3 or 4, whereas Task 7.3 started in Month 1. The reason lies in the availability of a stable draft standard for the DVB-H system that required immediate action in the development of DVB-H test signal generators, test streams and test receivers, to have them available before the end of the first project year for integration and interoperability tests.

The components for the backbone architecture are being specified during the second and third quarter of 2004 and subsequently integrated into a laboratory testbed where sub-systems will be tested for interoperability and performance. These interoperability and performance tests will take place during the 3rd and 4th quarter of 2004. Towards the beginning of 2005, the WP7 part of the test infrastructure will be available for integrating sub-systems developed and provided by other workpackages.

The work in Tasks 7.5 and 7.6 that focuses on the identification of Brazilian specific aspects for the fixed network has started in Month 4. In 7.5 a first version of a QoS Convergent Network Evaluation Tool is being developed which is planned to be validated by Month 18. Task 7.6 will target the definition of the INSTINCT architecture and protocols for a Brazilian environment. The results of both tasks will be compiled into Deliverable 7.3.

Deliverables

No.	Title	Nature	Editor	Delivery	Description
D7.1	Description of the fixed support infrastructure in INSTINCT	(Report)	SAG	Month 9	Description of the WP7 sub-system, its components, agreed interfaces, specified protocols etc.
D7.2	Results of the validation of the infrastructure components	(Report)	RS	Month 18	Results of performance measurements and interoperability tests of the components and sub-systems in the WP7 work area
D7.3	Definition of the INSTINCT architecture and protocols for a Brazilian environment and a QoS Convergent Network Evaluation Tool Specification (Report)	(Report)	PUSP	Month 24	Definition and description of specific aspects of Fixed Network Architecture due to Brazilian environment, definition of specific Brazilian needs for protocol engineering (IPv6, billing, etc) except QoS control, proposal of an architecture of protocols to control QoS

Milestones

Milestone Number	Date	Description of milestone
M7.1	Month 3	Outline specification of the fixed network infrastructure
M7.2	Month 18	Validation of network infrastructure components
M7.3	Month 21	Validation of protocol implementations
M7.4:	Month 24	Validation of QoS tools (prototypes)
M7.5	Month 18	Validation of Evaluation Tool

Task descriptions

Task 7.1: Fix network architecture (led by SAG)

Objectives

A comprehensive survey of the available equipment for a full IP backbone architecture for broadcast services will be carried out, including an assessment of the hardware used by telecom operators (microwave links, cross-connects, etc.). Suitable devices will be selected and tested in the field to verify that they can be smoothly integrated in a traditional broadcast architecture part of the INSTINCT system. Strategies for the integration of low power transmitters into such an infrastructure will be explored. The partners will also investigate the mechanisms that are necessary to provide DVB services over telecom/ IP networks. This investigation will be carried out in close collaboration with WP 2.

Things to do

1. Assessment of available equipment for the IP backbone architecture for the testbed
2. Verification of integration and interoperability of all devices
3. Verification of delivery mechanism for DVB over IP networks

Expected outputs

- Contribution to D7.1 (M9):
- Contribution to D7.2 (M18):

Expected issues

- A potential problem is the availability of network equipment for interoperability test (or the price for renting such equipment).
- Clarification will be required on the network equipment that will be used for the Brazilian testbed, the differences in protocols, interfaces etc.

Outputs from each partner

Partner	Effort	Expected output
SAG	12	General proposal for a complete backbone architecture suitable for Instinct Verification of integration and interoperability tests of existing IP backbone equipment (IPv4 and IPv6) and of mobile network operators core network equipment
TDF	3	Verification of integration and interoperability tests of telco network equipment for transport of DVB services Contribution to backbone architecture
TBM	6	Verification of integration and interoperability tests of DVB core network equipment, including DVB-H multiplexers/ inserters Contribution to backbone architecture
PUSP	4	Comparison and synchronisation of definition of Brazilian Fixed Network aspects.

Time plan

Sub-task	Deadline	Participating partners	Leading partner	Output to
Outline document for general proposal for complete backbone architecture	30 April 04	SAG, TDF, TBM	SAG	D7.1
Preliminary verification and interoperability tests	31 July 04	SAG, TDF, TBM	SAG	D7.1
Final document D7.1	30 Sep 04	SAG, TDF, TBM	SAG	D7.1
Definition of Brazilian Specific Aspects for Fixed Network Architecture	31 Mar 05	PUSP	PUSP	D7.3

Task 7.2: Protocol engineering and network management (led by FTRD)

Objectives

An architecture of cooperating networks will be defined for this project. Existing and newly developed tools for seamless delivery of multimedia services as specified in other WPs will be validated and integrated into the fixed support infrastructure. This includes the evaluation of the potential of IPv6 on the fixed network, which is used as a secure protocol for mobility, and to the evaluation of return channels performance as influenced by the fixed networks.

Things to do

1. Development of strategies for delivery of DVB services over narrow bandwidth IP networks including mechanisms for remote services requests.
2. Development of rules for session management including strategies for handover between networks.
3. Development and implementation of suitable negotiation protocols between different types of networks. Specification of an end-to-end QoS Control Architecture.
4. Specification of a Brazilian Solution for Protocols Issues.
5. Specification of an Integrated Convergent Network & System Management Solution (ICNSM).
6. Specification of Characteristics for Brazilian Environment for ICNSM.

Expected outputs

- Contribution to D7.1 - requirements for protocols for the delivery of Instinct services, including DVB over IPv6
- Contribution to D7.1 - requirements for the protocol stack for DVB-H delivery via DSL links or similar
- Contribution to D7.2 - rules for using the backbone infrastructure and suitable protocol stacks
- Contribution to D7.3 – Proposal of an architecture of protocols to control end-to-end QoS in the Brazilian environment.
- Contribution to D7.3 – Definition of specific Brazilian needs for protocol engineering (IPv6, billing, etc) except QoS control.

Expected issues

- The standardization process for DVB over IP is ongoing in DVB and IETF. Delay may have to be expected with the availability of the merging standards.
- Preference of CS or PS service classes in UMTS networks is still unclear. Instinct relies on the availability of PS service classes.
- Some Network Operators are not willing or even ready to share network and system management information

Outputs from each partner

Partner	Effort	Expected output
FTRD	15	Definition of protocols for smooth handover between networks based on existing and emerging standards
Brunel	4	Implementation of handover protocols in the service management sub-system
RAI	4	Testing of implementations of DVB over IP systems, tests of handover efficiency and security
TDF	8	Integration of all protocol stacks into the backbone testbed
PUSP	12	Specification of a Brazilian Solution for Protocols Issues Specification of a End-to-end QoS Control Architecture and protocols

Time plan

Sub-task	Deadline	Participating partners	Leading partner	Output to
Definition of handover protocols	September 04	FTRD, Brunel	FTRD	D7.1
Implementation and validation of handover protocols in the service management	December 04	FTRD, Brunel, TDF	Brunel	D7.2
Development and validation of handover protocols	March 05	FTRD, Brunel, Netikos	FTRD	D7.2
Implementation and validation of DVB over IP systems	April 05	RAI, TDF	RAI	D7.2
Integration of protocol stacks into testbed architecture	April 05	FTRD, Brunel, TDF	TDF	D7.2
Specification of a Brazilian Solution for Protocols Issues	April 05	PUSP	PUSP	D7.3
Specification of an End-to-end QoS Control Architecture and protocols	April 05	PUSP	PUSP	D7.3

Task 7.3: QoS management toolbox (led by RS)

Objectives

For all parts of the infrastructure used in this project, QoS tools will be selected and/ or developed and implemented that provide relevant information to a management system in charge of allocating appropriate capacity to applications and users. Key words are load balancing, test probes for several protocol layers, QoS mapping across different networks, access network specific QoS algorithms, and support of handover strategies in the radio access networks. With the contribution of Brazilian partners specific local characteristics would be identified, facilitating and even enabling the deployment of the QoS management tool box in the Brazilian environment.

Things to do

- Definition and development of QoS management sub-systems
- Implementation and verification of QoS management sub-systems
- Development, modifications and up-grades of QoS tools and test probes
- Integration and validation of all QoS related components and systems
- Identification of specific issues for the QoS management toolbox for the Brazilian environment and evaluation of its deployment in Brazil.

Expected outputs

- Contribution to D7.2 – DVB-H protocol analyser (Hardware/ software)
- Contribution to D7.2 – Perceived quality measurement tool for multimedia content
- Contribution to D7.2 – QoS management sub-system
- Contribution to D7.2 – Basic set of test probes integrated into the backbone testbed
- Contribution to D7.3 – Specification of issues to be considered in the Brazilian environment for the deployment of the QoS Management Toolbox.

Expected issues

- The standardization of QoS parameters will most likely consider inputs from Instinct and make them part of a recommendation. Inputs to this standardization process are also expected from other sides. The final ETSI recommendation may include specifications that require an up-date of the tools and sub-systems developed in Instinct.
- To date it is not clear how much the approach to QoS management in Instinct differs from that in other projects eg. Enthrone. If the differences are greater than expected, this may necessitate additional effort in Instinct.

Outputs from each partner

Partner	Effort	Expected output
RS	30	Development, validation and integration of QoS tools and test probes to be connected at the edges of sub-networks in the backbone testbed, addressing physical layer, protocol layer and application layer
Brunel	4	Requirements for QoS management, especially load balancing Verification of QoS management sub-system
RAI	6	Verification of DVB-H related QoS strategies
TDF	6	Design and integration of QoS monitoring tools, especially for in-car QoS measurements
TBM	12	Design and implementation of supervision software including de-bugging tools
PUSP	7	Identification of specific issues to be addressed in the QoS Management Toolbox for the Brazilian environment and evaluation of deployment in Brazil.

Timeplan

Sub-task	Deadline	Participating partners	Leading partner	Output to
Development and validation of QoS test probes for DVB-H	30 April 2005	IRT, RS, TDF, TBM,	RS	D7.2
Development and validation of QoS sub-system for load balancing	30 April 2005	Brunel	Brunel	D7.2
Validation of in-car measurement system	30 April 2005	TDF, RS	TDF	D7.2
Development and validation of a QoS supervision tool	30 April 2005	RAI, TBM, TDF,	TBM	D7.2
Specification and addressing of specific issues of the Qos Management Toolbox for the Brazilian environment and evaluation of its deployment in Brazil	31 July 2005	PUSP	PUSP	D7.3

Task 7.4: DVB/IP head-end for mobile (led by MLAB)

Objectives

The DVB/ IP head-end will be specified, implemented and validated. This head-end represents the borderline between the fixed support infrastructure and the radio networks as provided by WP6. Communication between quality test probes and a network management system via standardised interfaces and protocols will be established across the borders of fixed and radio networks, especially for probes located at future combined base stations (DVB-T, -H and UMTS).

Things to do

- Development, implementation and validation of a preliminary vision of a mediation platform for a combined DVB-H/ UMTS base station
- Depending on the progress in standardisation, an up-grade of this preliminary version may be necessary

Expected issues

- The plans for the standardisation work within the DVB CMBS group (Converging Multimedia Broadcast Services) include as a date for the delivery of a final draft June 2005. This follows from the Call for Technologies for IPDC over DVB-H (closing date 16 September 2004). Depending on other than technical issues, there may be delays in the process, resulting in the implementation of a preliminary solution for the mediation platform that may need up-dates later to become standard compliant.

Outputs from each partner

Partner	Effort	Expected output
MLAB	10	Development and implementation of sub-systems for the mediation platform components needed in a DVB/IP headend for mobile
IRT	2	Verification tests of sub-systems in an independent testbed
TDF	3	Adaptation and integration of sub-systems
TBM	6	Implementation and verification tests on a specific headend
PUSP	3	Study of transferability of the CMBS solution to a Brazilian environment

Time plan

Sub-task	Deadline	Participating partners	Leading partner	Output to
Specification and development of sub-systems for mediation platform	30 June 2005	MLAB, TBM	MLAB	D7.2
Verification tests of sub-systems	30 June 2005	MLAB, IRT, TBM	IRT	D7.2
Report on transferability of sub-systems to Brazilian environment	30 September 2005	PUSP	PUSP	D7.3

Task 7.5 The QoS Convergent Network Evaluation Tool– (led by PUSP)

Objectives

In this task a first version QoS Convergent Network Evaluation Tool will be developed. This tool will enable customised solutions for network analysis and optimisation. The proposed application level tool will, in its final version, permit the evaluation of consumer acceptance where no infrastructure is available.

Things to do

- Development, implementation and validation of a QoS Convergent Network Evaluation Tool
- Development, implementation and validation of a tool for evaluation of consumer acceptance

Expected outputs

- Contribution to D7.3 – Description and specification of a proposal for an integrated network and system management solution in an heterogeneous convergent network.
- Contribution to D7.3 - Identification, definition and description of Brazilian characteristics for the Management Solution.

Expected issues

The adaptation of the solution for the evaluation tool may meet unexpected constraints in an European scenario. These need to be studied and may resuscitate an up-date or a modification for full integration in the project work.

Outputs from each partner

Partner	Effort	Expected output
PUSP	26.5	Specification, development, implementation and verification of an Integrated Convergent Network Evaluation Tool supporting the System Management Solution
UEA	10	Development and verification of the evaluation tool

Time plan

Sub-task	Deadline	Participating partners	Leading partner	Output to
Proposal of an end-to-end QoS control architecture	30 November 2004	PUSP	PUSP	D7.3
Specification of an Integrated Convergent Network supporting the System Management Solution	30 April 2005	PUSP, UEA	PUSP	D7.3
Verification of characteristics of the Management Solution for Brazilian environment	31 December 2005	PUSP, UEA	PUSP	D7.3

Task 7.6 Backbone Aspects for Brazilian Environment – (led by PUSP)

Objectives

This task will provide the specific evaluations, analysis, proposals and definitions for the implementation of INSTINCT in a Brazilian environment. It includes surveys of the equipment available for a full IP backbone architecture for collaborating broadcast networks in Brazil, specifically assessing the suitability of the hardware used by Latin American telecom operators for the delivery of IP services. The Brazilian partners will identify and propose a list of specific local issues that need to be addressed.

Things to do

- Definition of Brazilian scenarios, including identification of sub-systems and components
- Interaction with WP9 Task 2 (Eco System) for the definition of Brazilian Scenarios
- Definition of Brazilian Specific Aspects for usage of IPv6 in the proposed Fixed Network Architecture
- Proposal for a QoS control model for the INSTINCT system in Brazil

Expected outputs

- Specification of Brazilian Fixed Network Architecture and Requirements – contribution to D7.3 (M24)
- Survey and evaluation of Brazilian reality for realization of INSTINCT in Brazil - contribution to D7.3 (M24).

Expected issues

- Clarification will be required on the network equipment that will be used for the Brazilian testbed, the differences in protocols, interfaces etc.
- Non-availability of ATM based backbone networks, availability og Gigabit Ethernet instead in Brazil

Outputs from each partner

Partner	Effort	Expected output
PUSP	26	Definition of Brazilian Fixed Network aspects and evaluation of reality for implementation of INSTINCT in Brazil. Specification of characteristics of the Brazilian environment for the Management solution.

Time plan

Sub-task	Deadline	Participating partners	Leading partner	Output to
Survey and evaluation of Brazilian reality for simulation and demos	31 Mar 2005	PUSP	PUSP	D7.3

WP8: Integration, Demonstration and Field Trials

Objectives

The objective of this work package is to evaluate and demonstrate the benefits of INSTINCT concepts and developments. Technology, business and usage aspects will be validated both in the laboratory and in the field, using two on-air platforms in Europe and two lab demonstrators, respectively in Europe and Brazil.

The main tasks of WP8 are to:

Provide implementations for reference scenarios combining DTV and radio-communication systems

Integrate and test developments of other work packages

Validate in the laboratory and in the field all the concepts and implementations

Validate the consumer perception of the services, and the system in general

Organising the technical aspects of demonstrations

In Europe, this work package will strive to implement, demonstrate and validate both a broadcast-centric convergent system and a telco-centric one. To do so, it is anticipated that two distinct terminal concepts will be demonstrated, while the network and service infrastructure will try to share as many common features as possible.

In Brazil, this work package will focus on the implementation of one scenario. Considering the many possibilities to scenario implementation and the differences between a broadcast, or telco-centric approach, the Brazilian scenario implementation will be set depending on system availability as well as on market drivers. This way, one terminal concept will be demonstrated, while the network and service infrastructure will try to share as many common features as possible with the European systems.

Strategy

Platforms

European platforms are located in the three most represented countries in the project. This should enable easy access to those platforms. The UK-based platform is built as a stand-alone demonstrator, upon the existing system implemented for CISMUNDUS. This demonstrator will be used to demonstrate the general concept at technical exhibitions.

The two real on-air platforms, in France and Germany, will strive to have complementary features. It is anticipated that the Metz platform could focus on the telco approach that offers TV on mobile handsets, using DVB-H while the Munich platform would concentrate on the broadcast approach, revolving around a MHP based terminal and standard DVB-T. These platforms could be interconnected to evaluate the ability to have distributed servers and network components.

For the Brazilian platforms, an important issue to be considered is the lack of infrastructure and the availability of on air systems, strongly restricting the possibilities of field trial to these activities. The build-up of a Brazilian demonstrator is anticipated to be based on a combination of network simulations and real radio access and terminal components, subject to lending by INSTINCT partners or sponsors. This platform will be the base environment for demonstration of INSTINCT concepts at technical exhibitions and specialised forum.

The goal of INSTINCT is to provide the key enablers for a commercial exploitation of convergent services. Hence, WP8 will focus on demonstrating and testing these enablers rather than a final off-the-shelf system. This is all the more true in phase one of INSTINCT, and for the terminal aspects. In this first phase, terminals will be distributed rather than integrated, enabling to demonstrate envisaged services and user interfaces while restraining the time-consuming work of optimisation that can be hazardous, as shown in the past.

The availability of UMTS facilities should be ensured by the end of 2004 for all European platforms. However, experience has shown that UMTS networks roll out has been differed many times in each of the corresponding countries. Besides, there is a clear interest of showing how a broadcast channel can be used in conjunction with GSM/GPRS to offer low cost multimedia services that UMTS might be able to offer in the future. INSTINCT developments will therefore strive to comply with both 2G and 3G networks. As a very particular market, it is clear that Brazil will not keep up to speed in the short term with European technology system deployments (TV and cellular systems). This way, it is very unlikely that UMTS will be available to be integrated on the demonstration activities in Brazil. The Brazilian team will work over this scenario trying to integrate 2G and 2,5 G systems, developing ways to show how a broadcast channel can be used in conjunction with GSM/GPRS to offer low cost multimedia services helping INSTINCT developments to comply with both 2G and 3G networks.

The use of IPv6 may be a promising solution for solving several issues, among which mobility. Whereas IPv6 compliant equipment now appear on the market for the broadcast industry, gaining access to a test 2G/3G network that offers IPv6 features seems to be out of scope in INSTINCT. Therefore, it is envisaged that only some parts of the INSTINCT infrastructure will make use of IPv6 or that alternative technologies (e.g. WLAN) will be used as a substitute for demonstration of specific features.

Since it builds on all other work packages, an identified risk is the delaying of other WP components delivery. Because of a very tight schedule and the number and variety of components to be integrated onto the platforms in the first phase, there is a chance of not being able to produce working demonstrations of all expected features. INSTINCT will therefore reuse parts developed in previous projects so that missing tools, hardware components, etc. can be replaced by older versions or similar components.

For these reasons, scenario implementations and preparatory integration work will start as soon as in the second quarter. Besides, field trials will start in the second semester and will be scheduled every time a significant step has been achieved. This particularly entails testing of early prototypes of DVB-H transmission and reception equipment.

Integration will be organised so that components developed in other WPs are integrated first on the platform that is best designed for a time-effective integration of this component. Therefore integration can happen in parallel on several platforms, even though every single component gets integrated/bug fixed on only one platform before being delivered to other platforms. Eventually, platforms will share a maximum number of common features, though and reuse of components on all platforms will be fostered whenever possible.

In Europe, two major demonstrations will be organised that match the INSTINCT integration planning, one at a broadcast fair (likely to be IBC2005) and one at a telecom fair (possibly 3GSM World Congress 2006). However, it may be difficult to select a telecom fair that will fit with the schedule so that this demonstration may be postponed to the first months of the second phase. Besides, INSTINCT will be represented at other workshops or conferences to present preliminary results (e.g. DVB-H demonstration). In Brazil, two additional events will be targeted: one at a broadcast fair (probably within the Brazilian Television Society-SET schedule) and one at a telecom fair (Futurecom- October/2005). Brazilian partners will also encourage the participation to other events outside Brazil, within Latin American.

Planning

As a rule, milestones and deliverables are common to Brazil and Europe even though development, integration and tests can run in parallel with a reasonable level of independence between the two.

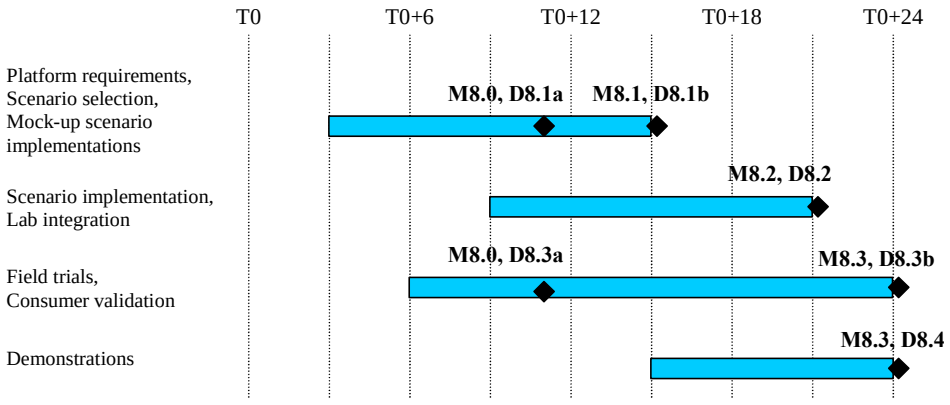


Figure 12: WP8 Planning

Milestones

No.	Date	Description of milestone
M8.0	November 04	**Draft version of platform requirements identified, sample services and mock-up services. Early DVB-H field trials results reports.** Towards reaching Milestone 8.1, a first intermediate milestone is set. An intermediate D8.1 is provided. Additionally, results of first DVB-H trials are reported.
M8.1	March 05	**Platform requirements identified, sample services selected, mock-up implemented** This first milestone consists in preparing the integration, field trial and demonstration work. To do so, the output of other work packages and especially WP2 have been analysed to define the most appropriate elements of service scenarios to be demonstrated. Network and terminal components to test and demonstrate have been selected as well. Mock-ups of the services are finalised, possibly after an iteration process realised in conjunction with the consumer needs analysis/validation task. Each of the three test/demonstration platforms has evaluated precisely its needs in terms of equipment, which is now ordered and installed whenever possible. Radiofrequency licenses have been obtained.
M8.2	September 05	**Services implemented and platforms integrated** For the second milestone, all WP developments to be field trialed in phase 1 are completed and integrated into a demonstrable system. This includes service scenario implementations, content and servers, network and terminal implementations and/or a simulation of some of these components, for the Brazilian platform.
M8.3	December 05	**Field trials and demonstrations performed** For this third milestone, field trials have been carried out, either on sub-systems of INSTINCT or fully integrated test beds. Consumer validations have been conducted. This has been done whenever possible on real systems rather than mock-up scenarios. One or two significant demonstrations have been performed at a major broadcast and/or telco exhibition, on each continent.

Deliverables

No.	Title	Nature	Editor	Date	Description
D8.1	Platform Requirements	Report	RBB	1st draft: Nov. 04 Final delivery: Mar.05	This deliverable defines all the technical and logistic requirements for designing and building the European demonstrators. In addition to this report, a CD containing mock-up versions of the service scenarios is produced.
D8.2	Integrated Platforms	Hardware/Software	TDF	Sept. 05	A video of one working demonstration platform is produced, on each continent. Additionally, it may be complemented by a non-contractual document, for internal use only, that captures integration procedures and/or functional tests performed on the system.
D8.3	Field Trials and Customer validations	Report	IRT	1st draft: Nov. 04 Final delivery: Dec. 05	This deliverables summarises the conclusions of all field trials and customer validations carried out in the course of the first phase of the project. Platforms architectures, the set of tests conducted and the methods to perform these tests are described in this deliverable. An analysis of the results of technical, functional and user trials concludes the document.
D8.4	Demonstration Activities	Report	Brunel	Dec. 05	This deliverable reports on demonstration activities conducted throughout the lifetime of the project. Demonstration objectives and scope as well as feedback of attendees are reported in this document.

Note: So as to offer better visibility on the intermediate results of WP8, two draft versions of D8.1 and D8.3 will be delivered in November 2004. The first draft of D8.1 will offer a close-to-final description of service features demonstrated, and the requirements on other WP developments (especially Terminal), as well as a good overview of platform specifications. D8.3 will provide the intermediate results of the first DVB-H field trials conducted in Metz and Berlin.

Task descriptions

Task 8.1 Scenario implementation

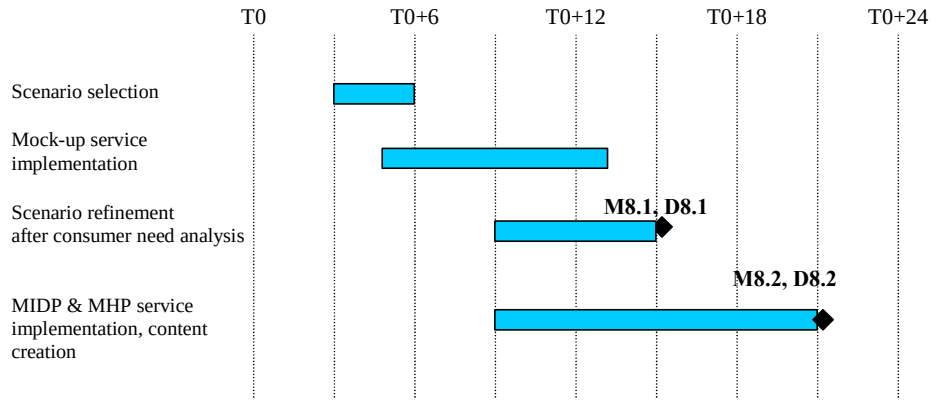


Figure 13: Task 8.1 workplan

Task 8.1 will be composed of four phases:
- Selection of the service components that must be demonstrated
- Mock-up implementation of these services for validation of consumer needs and early demonstrations of INSTINCT services
- Refinement of the demonstrated services after user input is gathered, update of corresponding mock-ups
- Implementations of services using MIDP & MHP middleware, and the contents that come with these services.

This task is carried out in strong connection with WP2, for the service definition and user aspects but also with WP3, for the content creation and generation tools, as well as WP5, for terminal middleware platforms.

For phase one of INSTINCT, three major kinds of terminals will be demonstrated:

- A mobile phone, running MIDP applications, connected to a DVB-H reception module, possibly via a PC or USB
- A tablet PC, running MHP applications, receiving DVB-T programs from a USB or PCMCIA module
- A PDA, running a light-weight version of MHP and/or MIDP, with WLAN/Bluetooth connection to a DVB-T/H module, possibly through a PC

It is anticipated that two scenarios will be implemented in Europe and one in Brazil, one that focuses on a more traditional broadcast approach, with a large part of free-to-air services, while the second one will be designed to benefit more to telco operators and the last one will be specifically tailored for the Brazilian market. The envisaged mapping between the scenarios and the target demonstration terminals should be the following:

	Telco oriented scenario	Broadcast oriented scenario	Brazilian market scenario
Mobile Phone	MIDP, DVB-H based	No	To be defined
Tablet PC	No	MHP, DVB-T based	MHP, DVB-T based
PDA	MIDP, DVB-H based	MHP, DVB-T based	MIDP, DVB-H based

Netikos and FT RD will focus on development for small handheld terminals, with the telco approach in mind (MIDP based, pure IP and DVB-H). Conversely, RBB and Brunel will ensure the development of MHP applications that target larger handsets, that are also capable of receiving traditional DVB-T services.
Optibase will contribute to the production of multimedia contents in different formats adapted to the selected terminal platforms. Brunel will finally use the service creation tools (WP3.1) and content encoding tools (WP3.2) to index and encode contents in a scalable way.
CERTI will specify the Brazilian service, implement a reference mock-up of this service and the user interfaces, while UEA will actually develop the application and USP will provide the contents.

Partner	Effort	Expected output
Brunel	10	Mock-up services implementation. Development of MHP services for large handset devices (TabletPC, webpads, PDAs) to implement the broadcast oriented vision focused on DVB-T/GPRS/UMTS Indexing and encoding of contents and services
FT RD	6	Contribution to the design and mock-up implementation of a telco business centric service, based on MIDP mobile phone with DVB-H/GPRS interfaces. Provision of content for internal purposes only.
Optibase	2	Formatting of multimedia contents for all services
RBB	8	Detailed specification of the service scenarios to be demonstrated, feed-back on mock-up implementation. Production of the contents for the broadcast oriented scenario, supervision of all service scenario developments. Coordination of task 8.1
Netikos	10	Specification of the service scenarios to be demonstrated. Implementation of a selected service in MIDP.

Partner	Effort	Expected output
CERTI	14	Realistic Brazilian service scenario design, mock-up and interface implementation.
UEA	13	Aplication development of the Services and applications to Ilustrate Instinct's Brazilian Scenario; Use the content creation tools developed on WP3 for content production and publishing;
USP	9	Creationa and gathering of the necessary media for Brasilian demonstrations;

To recap the responsibilities as to specific targeted scenarios,

	Telco oriented scenario	Broadcast oriented scenario	Brazilian market scenario
Specification	Netikos, FT RD	RBB	CERTI
Content design	FT RD	RBB	USP
Prototyping	Brunel	Brunel	CERTI
Implementation	Netikos	Brunel	UEA

Task 8.2 Integration

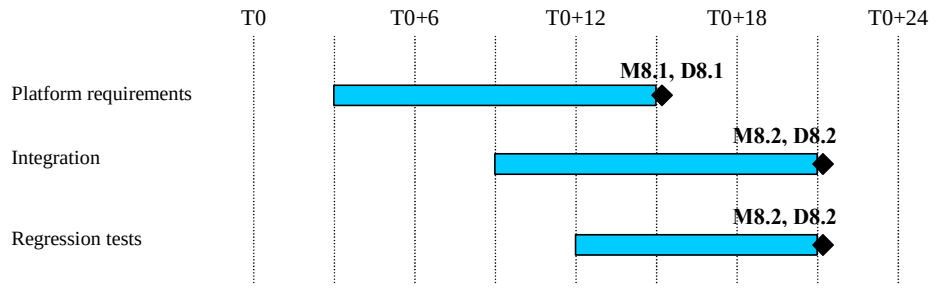


Figure 14: Task 8.2 planning

Integration is performed in three steps:

- **Platform description and requirements**

Each platform will be described, in terms of what is already available, especially from past projects, and what needs to be later integrated to the platform.

At this stage, decisions will be taken about the required radio network set-up (coverage area, radio engineering studies, need for DVB gap fillers, penetration in urban areas, availability of 3G networks, need for transmission licenses) that very much depends on the demonstrated scenarios.

An important aspect dealt with by this task is the scheduling of the integration phase for the various components provided by other work packages.

The results of this task will be captured in D8.1.

- **Integration**

The key phase of integration intends to combine the various developments of all work packages and off-the-shelf hardware and software components available on the market to produce three fully-featured platforms, among which one itinerant demonstrator.

This phase entails the definition of the exact sequence of integration steps to be carried out to realise an integrated INSTINCT demonstration platform. It also implies the actual installation of hardware and software, basic testing of single equipment or pieces of software, basic testing of the interaction of these components with the rest of the system, reporting of issues to the relevant parties, and follow-up of these issues.

This should be reported in one or several internal documents so that partners can later take advantage of this integration phase and reproduce an INSTINCT or part of it for their own purposes.

- **Regression testing**

Regression testing consists in making sure that the addition of new features and capabilities to the integrated system does not interfere with existing tested functionalities. It must be done on a regular basis so as to be able to assert that a well defined set of components, in a specific version, can be labelled and considered a baseline for later trials and demonstrations.

The idea, as for the rest of this work package, is to make sure that the progress is incremental and that, in the end, if not all envisaged features work, at least a significant portion of the work can be evaluated and demonstrated.

Regression tests will de defined and documented so that partners can keep track of the exact status of the system, and know what features have been successfully implemented.

Brunel, IRT and TDF will be involved in all these tasks, as they maintain the European platforms. Besides, on the terminal side, MSPS will ensure the integration of the mobile handsets, Netikos that of the services. MotLabs and Rohde&Scwharz will support the integration of network and QoS aspects. Thales will set up and finely tune the radio network components on all platforms. CERTI will lead the specification of the Brazilian, and try to obtain equipment on loan for the Brazilian platforms. UEA will be responsible for the integration of the Brazilian platform with the simulation of the INSTINCT system.

Partner	Effort	Expected output
Brunel	8	Specification of itinerant demonstrator requirements. Integration of most relevant and demonstrative INSTINCT developments on the itinerant demonstrator for show cases. Regression testing
IRT	12	Specification of platform requirements. Integration of a sub-set of INSTINCT developments on the Munich field trial platform. Regression testing
MSPS	8	Integration of front-end aspects with mobile phone terminal
MLABS	3	Integration of network aspects: service/user management system, dvb/ip head-end control
Optibase	2	Integration of content generation/transcoding tools
Netikos	8	Integration of service applications on reference terminals
RS	2	Integration of QoS tools on test platforms
TDF	12	Specification of platform requirements. Integration of INSTINCT developments on the Metz field trial platform and more specifically service and network aspects. Support of demonstration terminal integration, particularly for DVB-T enabled terminals. Regression testing.
Thales	9	Integration of co-siting and low power transmitters on test platforms
CERTI	4.3	Evaluating the feasibility to explore a DVB-T/H demonstration; Considering the possibility to get specific equipments lent by interested companies to show their equipments with Brazilian Demonstrator;
UEA	15	Based on the Brunel's platform a stand alone demonstration platform will be developed and installed on Brazil; Integration of simulation of the INSTINCT system with Brazilian demonstration platform. Test, validate and integrate the last project's application and APIs over the Brazilian Demo Terminal

Task 8.3 Field trials

The aim of this task is to carry out the field tests on the on-air Metz and Munich platforms. Tests will verify the INSTINCT concept and deliver pratical recommendations, on technical and functional performances.

This phase encompasses the definition of the tests, the actual testing and the reporting in D8.3.

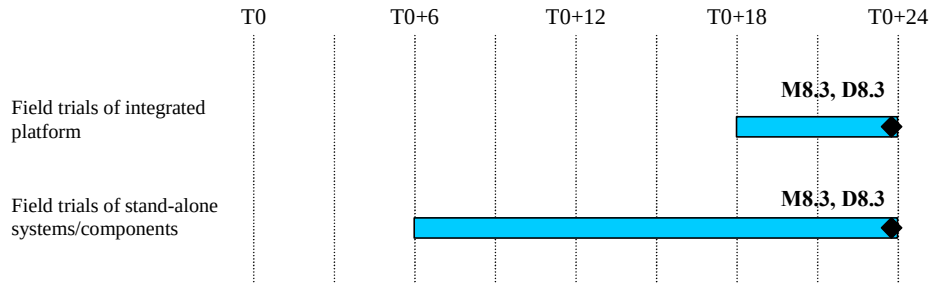


Figure 15: Task 8.3 workplan

TDF and IRT, with the support of Thales, will test the performance of the new INSTINCT system as integrated at the end of the first two-year period. Possible investigations could include but are not restricted to testing of DVB-T/H mobility and low power/small form factor DVB-T/H receivers, evaluation of the Quality of Service management tools, solving of scalability issues, validation of the service, user and resource management tools, evaluation of the networks for transporting data and signalling up to radio access networks, evaluation of combined networks latency and synchronisation, etc…

In addition to this task of validation of a typical INSTINCT converged system, a number of field tests will be dedicated to the validation of more stand-alone components that might be integrated either in phase one or in phase two. For instance, T-Systems, Rohde & Schwarz and TDF are likely to focus on evaluation of DVB-H hardware and software releases that will evolve until final standardisation.

Partner	Effort	Expected output
IRT	3	Hosting of field trials for German partners, in Munich, centered on DVB-T/UMTS/MHP approach. Functional validation of services.
RS	3	Support to field trial of QoS mechanisms and management tools
TDF	10	Hosting of field trials in Metz, centered on DVB-H/GPRS/MIDP approach. Early validation of DVB-H standard for use in INSTINCT. Testing of DVB-T/H mobility management, validation of network/user management mechanisms, validation of network engineering concepts, validation of protocol engineering choices, functional validation of services.
Thales	4	Field trials of co-siting/low-power transmitter aspects
T-Systems	2	Early DVB-H field trials in Berlin, to feed back DVB-H group

Task 8.4 Consumer validation

Based on the outcome of *Task 8.1 Scenario implementation* and using the platforms as set up in *Task 8.2 Integration*, consumer validations will be carried out in two major steps.

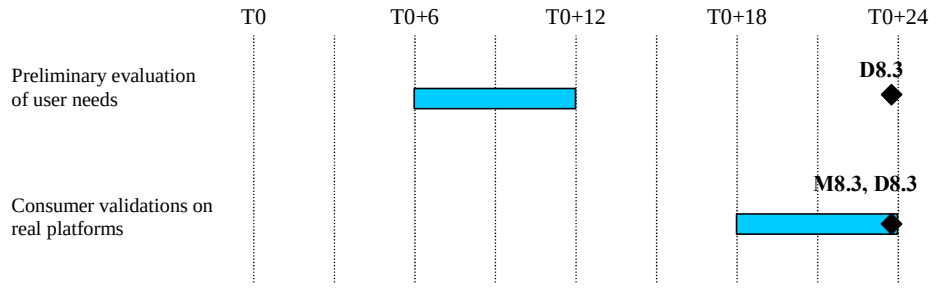


Figure 16: Task 8.4 workplan

First, using mock-up implementations of the service scenarios, the actual expectations of the users will be assessed.

This will be done with a realistic and pragmatic approach and a view to serving the public. RBB will validate the navigation structures and the user interfaces with surveys of user groups recruited from appropriate target groups.
UoC, Brunel and CERTI in Brazil will carry out trials with methodologies from experimental psychology and existing testing standards, based on these mock-up implementations as well.
The task includes defining the test methodology, selecting the group of testers, carrying out these tests and analysing the results, then finally reporting to task 8.1 and WP2 about the necessary changes in the services and possibly business models.

Then, when the INSTINCT will be close to complete integration, user trials on the Brunel or TDF platforms will be conducted, with UoC methodology, so as to gain feedback on the perception of the user about the quality and interest of the technology that has been developed for the first phase of the project. RBB will try to get the feedback of the audience at IFA2005. CERTI and USP will use their final demonstrator, connected to available telco and local broadcast networks when possible to have more realistic feedback and a better understanding of the new services potential.

There again, the task includes defining the test methodology, selecting the group of testers, scheduling the tests, carrying out the tests and analysing the results, then finally reporting in deliverable D8.3.

As a result of this task, R&S will derive the relation between statistical parameters describing service quality for a user population, and the topology of the network. They will also investigate to which extent quality measurements can be translated into valuable information for billing systems and for resource management systems.

To recap the responsibilities for task 8.4,

	Telco oriented scenario	Broadcast oriented scenario	Brazilian market scenario
Validation on mock-ups	UoC, Brunel	UoC, RBB	USP, CERTI
Validation on system	UoC, Brunel, TDF	UoC, RBB	USP, CERTI

Partner	Effort	Expected output
Brunel	4	Hosting of the user trials using mock-up implementations and the itinerant demonstrator in Uxbridge
RBB	3	Validation of services against RBB targeted user groups, navigation of the scenarios on stand-alone demonstration terminals, around Berlin
RS	1	Analysis of relationship between statistical parameters and network topology, translation into billing information
TDF	2	Video quality testing along standardised procedures. Hosting of consumer validations in Metz
UoC	8	Specification and carrying out of consumer validations using first mock ups, then the real INSTINCT platforms
CERTI	2	Focus Group Planing, design and analysis; Interaction with WP2 Team to validate/feedback scenario and target results;
UEA	6	Support of necessary applications and technical infrastructure for consumer validations

Task 8.5 Demonstrations

The purpose of this task is to promote the INSTINCT developments and technology by showing a relevant demonstrator for technical exhibitions such as IBC2005. An exhibition at an appropriate telecom fair will be sought as well, that matches the integration agenda. This telecom fair is expected to be 3GSM World 2006, programmed in the early beginning of 2006. Besides, there is a strong interest in attending a consumer electronics fair such as IFA2005, where the interest of users could be assessed. IFA2005 will be mostly organised by German partners of the project, who have good experience of this event.

In Brazil, this task will be strongly connected to the consumer validation task, which is essential to evaluate the validity of INSTINCT concepts in Latin America. INSTINCT developments and technology will be demonstrated at a major Broadcast trade show in Brazil(probably connected to one of the events promoted by the Brazilian Television Society-SET on 2005).

An exhibition at an appropriate telecom (probably FutureCom 2005) fair will be sought as well, that matches the integration agenda. Besides, there is a strong interest in attending and participating on other events within Latin America enabling a broader spread of Instinct's concepts and standards.

Such exhibitions must be prepared well in advance. This includes:

- Planning and booking of the booth
- Planning the logistics (equipment shipping, request for transmission licences, request for specific facilities, etc…)
- Preparing papers and powerpoint presentations for presentations at the related conference
- Scheduling and doing the local integration/set-up of the system
- Defining and conducting the tests on the booth
- Designing, printing flyers, posters, brochures and any other kind of dissemination material

T-Systems will lead this activity, providing the industry perspective to the demonstrations, with a strong support of Brunel for organisation issues.

Partner	Effort	Expected output
Brunel	5	Planning, stand design, logistics, papers, posters for selected exhibitions
T-Systems	2	Organisation of exhibitions with an emphasis on DVB-H promotion
CERTI	5	Take part on one Telco and on one Broadcast event in Brazil, presenting the Instinct Vision to a selected Technical Audience
UEA	4	Provide the necessary demonstration infrastructure for tradeshow demonstration activities