FollowMe

ESPRIT Project N. 25 338

Work Package L
Periodic Progress Report
3/98 to 9/98

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dl2.doc	First skeleton, for input from partners	M. Breu	22.9.98
dl2.doc	First complete version	M. Breu	30.10.98
dl2.doc	Incorporation of board review comments	M. Breu	30.11.98

Contents

1 Summary of Key Indicators of Project Progress

The objective of the FollowMe project is to create a support infrastructure for mobile users. Users are enabled to connect to network-based services using a variety of devices and from different locations. The project will implement core facilities for the development of distributed mobile applications and a number of representative pilot services.

The project progress is measured against the planned results of the project. These are

1. a component **architecture** for distributed mobile applications that includes object mobility and distribution control, a framework for autonomous agent, and user access facilities.

2. an **infrastructure prototype,** providing a complete basic set of components for FollowMe application, to be integrated into marketable products for servicing mobile agents

3. two **pilot application** that demonstrate the architecture and the components,

4. a **public report** on the architecture, user needs, implementation guide, and the pilots.

The measures for theses results are the timely availability, and the quality of the intermediate deliverables and their benefit to support other work packages.

The main focus in the first six month was on the development of an overall architecture of the FollowMe framework and the design of the individual components. In the six month of this reporting period the project focussed on the implementation of the design documents. For the core work packages B to H now coded versions a available that a gradually refined. The pilot applications have developed first demonstrators that integrate the individual components.

The **architecture** is available in a second version (deliverable DA1.2) as planned. It was decided to shift the final version DA1.3 to project month 15, to finally integrate the experiences made in the individual projects.

For the **infrastructure prototype** there exists now a set of revised implementations. These implementations are integrated into the individual components. Especially the two **pilot applications** play now a major role in integration. For both pilot applications now first implementations are available that bring together FollowMe components.

The **public report** will consist of the architecture paper and the set of software reports issued for each component.

The next section gives details on the project's progress. The project review at the 12th of June was passed successfully. Section 3 summarises the reactions of the partners on the reviewer's comments. Section 4 gives an overview to the exploitation activities of each partner.

2 Project Progress

2.1 Management Information

Overall the project is on schedule. There was the joint decision to shift the final release of the architecture deliverable by three months, in order to base it onto the experiences made inside the development and integration of the individual components.

The mobile object workbench and the information space is now integrated in all other components and heavily used. The agent framework is now back on track. Version 1.2 of the framework is released. First integration in WP I are in progress. The release planning for the agent framework was extend in order to take into account constant maintenance of the components. A first set of monitoring tools for service deployment (WP G) is available. An announced delay due to staffing problems is considered uncritical, because there are no dependencies of other partners.

The user access has released v1.1 of the user access component. It supports four types of devices: Web-browsers, SMS-devices, email and fax.

The Bavaria-Online pilot application has concentrated on the "Regional Events Service". A first prototype, that mainly served for studying the potential implementation of the components was released. The second version under development and will be deployed by begin of November. The portfolio service is also under development.

The ETEL++ pilot application for a personalised newspaper has now produced an initial prototype which includes an article loader that fetches articles from the journalist's database and stores these articles into an Information Space. The prototype supports personalisation of editions by means of thematic and location keywords.

2.1.1   WP A (Architecture)

Little activity has taken place on this work package in the reporting period. APM has agreed a proposal for the content of DA1.3 the final architecture report and discussed it with the other project partners.

The partners have agreed to provide input to this task over the months of October and November and APM is to act as an overall editor of content and style with the final architecture document being delivered in December 1998.

2.1.2   WP B (Mobile Object Workbench)

The basic 'cluster' abstractions were re-implemented to allow it to be used as the basis for both mobility and persistence (MOW and IS)

A Class Repository was designed and built, to support wide area class mobility and versioning. (MOW)

During the period other partners have extensively used the Mobile Object Workbench (MOW). This usage has both generated feedback and has led to changes in then protocols used to support mobility and led to the need for extensive support activity the other partners in exploiting the capabilities of the MOW.

Work has also been undertaken in re-engineering of the MOW to create an appropriate set of abstractions that are common between the MOW and Information Space (IS).

Finally a security architecture has been developed based on SSL to support secure communications between (mobile) objects that may exist on different host machines.

These changes have both been provided incrementally to support the other partners and as a complete release MOW 2.0.

2.1.3   WP C (Personal Information Space)

During the last reporting period the design and implementation of Black Box Objects was completed. These objects provided a simple "file system model" of persistent objects. During this period the design and implementation of White Box Objects have been completed. White Box Objects provide a transparent implementation of persistence. In this model an object resides at a store. Methods may be invoked on the object while it is in the store. Method invocation results in the object being retrieved from a long term store (e.g. disk), de-serialised, and activated. The method runs in the object to completion, the results are returned and the object is re-serialized to long term store.

The current limitation imposed on the programming of White Box Objects is that they are single threaded (note this does stop a method in a White Box Object from spawning multiple threads during the methods execution, however they must all be closed down when the method returns). The design documents and implementation have been delivered.

2.1.4   WP D, E & F: Agent Framework

Due to the high degree of overlap between the UWE work packages it has become meaningful to describe the combined output of Work packages D, E and F as an Agent Framework. This grouping was presented to the first FollowMe review successfully and the deliverable schedule has now been presented as the roll out of the Agent Framework versions.

The Agent Framework has been under constant development through the summer period in order to try to make up time. As at the project progress meeting at FAST in July the basic script engine was at v1.1.4. This release provided a working script interpreter with console input/output. Full integration with Java was available so that it is possible to instantiate and use any object in the CLASSPATH of the running script interpreter. The Agent Framework was partially integrated with Flexinet and MOW objects (TrivTrader & PlaceImp) but not part of a cluster. Several demonstration scripts were included in the release. By the middle of August we had released v1.2 of the Agent Framework which put the mission scripts into the desired XML structure. Access to Personal Profile and simple Diary expressed in the mission script was also provided. By mid September the Agent Framework was at v1.2.3 and included the trader and an AWT front-end to a Personal Assistant. Using this release it is possible to load an agent mission into a trader, locate the mission by browsing, launch it from the AWT front-end version of the Personal Assistant and customize the agent via the XML forms interface (also implemented in this release using AWT).

Roll-out summary:

- v1.1.4 (27/7/98)

- v1.2alpha1 (18/8/98) // MOW v1.1

- v1.2.alpha2 (20/8/98)

- v1.2 (11/9/98)

- v1.2.1 (17/9/98)

- v1.2.2 (28/9/98) // MOW v2.0

- v1.2.3 (29/9/98)

The integration with v2.0 of the Mobile Object Workbench was particularly demanding due to design changes and this held up progress.

The focus of the v1.3 release is the complete integration of the Personal Assistant, Task Agent and User Access. In order to complete this task we will need to complete the integration of the PA with the Information Space and then 'switch on' access to the Personal Profile, Diary, Information Space and User Access from the Task Agent so that the PA mediates all of these connections. The hooks already exist in the code but are commented-out whilst integration work with User Access and the Information Space is completed. The second part of the work involves full integration with User Access. There is also a small amount of work required to tidy up the Diary. The delays that have built up from the delayed start to implementation are reflected in the roll out schedule in Appendix A which also states the status of the deliverables. Due to the way in which the Agent Framework work packages have overlapped we have shown a mapping from project deliverable to Agent Framework version and thus combined 16 deliverable items into 6 versions of the software.

2.1.4   WP G (Service Deployment)

The work-package G (Service Deployment) provides a set of monitoring tools. Monitoring tools return various quantitative information, each reflecting the usage of a particular resource like a CPU, a memory, disks or network links. That quantitative information can be used by applications as a base for building load-balancing policies. This is the case for Etel++.

The first period of the project (until last April) has been dedicated to analyse the requirements imposed on this work-package, to design it, and to publish an initial set of interfaces. This tasks are reflected in the documents DG1, DG2 and DG3.

The second period of the project, since April and until last September was almost solely dedicated to implementation. The first release of the software for the Service Deployment work-package has been delivered. This version makes possible the monitoring of the behaviour of several resources. The notion of Resource has also been implemented, and the object model offers the opportunity for programmers to define their own resources, that may not be mapped to concrete physical resources, in addition to the built in resources such as the CPU. The notion of Monitor has been implemented. In a nutshell, a Monitor is an active object that periodically observes a set of resources and gather their value. The notion of history has also been implemented. An History can be seen as a log in which gathered values can be stored for subsequent processing. Several Filters have also been implemented for processing Histories.

This first release is integrated with the work-package B, the MOW. Therefore, it is possible to monitor resource irrespective of their location, or of the location of the process that request monitoring.

Together with the delivered software, we included several examples that act has a road-map for other partners wishing to use this work-package.

The implementation of this work-package is not complete, however. First, we have to extend the set of monitored resources, and in particular, to implement the classes needed to monitor the behaviour of network links. Second, we have to implement a filter referred to as a "predictive filter". This filter returns predictions of possible behaviours of the monitored resources in the short term, based on all the gathered information that is stored in the history.

2.1.5   WP H (User Access)

The user access component is responsible for managing the interaction between a mobile agent and its (mobile) user. As common interaction medium XML and XSL was chosen and an appropriate design was developed (Deliverable DH3&4).

In the last six month the implementation of the user access started. Main work went into the design and implementation of the user access kernel and device gateways for mail, fax, SMS and http-connections. A revised implementation of the user access was delivered mid of August (DH5.2).

The discussions of with the partners led to an updated design that is governed by the pattern of self-rendering data. Currently an early release of the implementation of the updated design has been delivered.

2.1.6   WP I (Pilot Application Bavaria Online)

The requirements, and the architectural design for the pilot applications was finished (Deliverables DI2). Details of the architectural design were clarified in close co-operation with UWE in a dedicated meeting in Bristol.

Main work in PM 6 to 8 went into the detailed design (DI3) and a first test implementation of application-specific java classes.

At the 25th of May an initial meeting with representatives of the Bürgernetzvereine took place to clarify the co-ordination of the service development and deployment with the operational team. On recommendation of the EC reviewers supplement requirements deliverable to capture the end-user requirements is under preparation.

A first prototype of the pilot application was released End of July. This prototype mainly served to study the potential implementation based on the FollowMe components. A major revision will be released beginning of November.

The development on the "portfolio application" has started.

2.1.7   WP J (Pilot Application Etel++)

Etel++ is the second pilot application that will be implemented on top of the FollowMe infrastructure. Etel++ is an electronic newspaper offering to its readers (i) personalization, (ii) multi-terminal support, (iii) context-sensitive data and (iv) multimedia enrichment.

 The second period of the project follows an initial phase where requirements were isolated and the design of the application completed. This second phase, not surprisingly, has been

dedicated to the implementation of a first, yet incomplete, prototype of the application. In parallel to this implementation, additional design steps have been performed to integrate the concepts brought by other work-packages on top of which our application is built. Namely, we had to finalise our design to guarantee a smooth fusion with User Access and the Agent framework.

The initial prototype, as described by the deliverable DJ4.1, is able to produce personalized editions that are delivered to users connected to servers physically distributed. The delivered editions are solely based on HTML. This initial prototype also includes a article loader that fetches real Ouest-France articles from the database used by journalists and, after several transformations, stores articles into an Information Space. The prototype supports personalization of editions by means of thematic and location keywords. The core of the assembling phase, as described in DJ2 is complete. The prototype heavily uses the transparent reference model provided by the Work-package B and the black box model from Work-package C.

The short term will see the integration of User Access and the Agent Framework.

2.1.8   WP K (Exploitation)
The activities of this work packages are given in an extra section (see section 4 below).

2.1.9   WP L (Project Management)
The review at the 10th of July in Brussels was prepared and successfully conducted. The recommendations of the reviewers were taken into account to steer the further development in the project (see section 3).

As a first task the project implementation plan was updated with a detailed effort and dependency planing for the remaining deliverables.

2.2 Project Meetings

The following project meetings took place during the reporting period. Minutes and/or slides are available on the project server.

Date	*Location*	*Meeting*
22nd-24th April	Cambridge	FollowMe Team Meeting and Management Board
27th-28th May	Bristol	Meeting between UWE and FAST to discuss implementation of Pilot Application (WP I) using Agent Framework
9th June	Brussels	Preparation for 1st Review
10th June	Brussels	FollowMe 1st Review
27th – 29th July	Munich	FollowMe Team Meeting
30th September – 2nd October	Rennes	FollowMe Team Meeting and Management Board

2.3 Roster of Personnel on the Project

The following staff members contributed to the project.

Company	Name	Role in the Project
APM	M. Bursell	Software Engineer: Architecture and Mobile Workbench
	D. Donaldson	Software Engineer: Architecture, MOW and Personal Information Space
	D. Franklin	Software Engineer: Architecture and Personal Information Space
	W. Harwood	Software Engineer: Architecture and MOW
	R. Hayton	Software Engineer: Architecture and MOW
	A. Herbert	Project leader at APM, Project Board , Chief Architect
	R. Chiltern	Software Engineer: MOW
	J. Cooper	Software Engineer: MOW
	M. Madsen	Software Engineer: Internal Review
	T. Ugai	Software Engineer: Security
FAST	M. Breu	FollowMe Project Manager, software engineer
	L. Gebauer	Contact Manager: Pilot Application
	R. Haggenmüller	Project Board
	H. Nandasena	Project Assistant
	S. Pöllot	Software Engineer: User Access and Pilot Application
	A. Rajakarunanayake	Software Engineer: Pilot Application
	H.-G. Stein	Software Engineer, Work package coordinator WP J (Pilot 1)
	A. Sindermann	Software Engineer: User Access
	E. Triep	Work package coordinator WP H (User Access)
	R. Sembacuttiara.	Software Engineer: Version Management
	H. Köhler	Project Assistant
INRIA	L. Amsaleg	Full time engineer: ETEL++
	M. Banatre and V. Issarny	Project leaders at Inria
	M. Billot	Full time engineer: WP-G (Service Deployment)
	P. Couderc	PhD student: mobility of documents
	A-M. Kermarrec	Researcher: mobility of documents
	J-P. Routeau	Engineer, helps in building the bridge between ETEL and ETEL++
TCM	M. Le Nouy	Engineer: Etel++.
	C. Philibert	Project leader at TCM, project board,
	B. Toullier	Engineer: Etel++,
UWE	S. Battle	Software Engineer and Researcher: WP D
	L. Bull	Project Mentoring: WP D, E and F
	N. Taylor	Software Engineer and Research: WP F
	J. Tidmus	Software Engineer and Research: WP E
	M. Yearworth	Work Package leader for WP D, E and F, FollowMe Management Board and Project leader at UWE, Exploitation activities

3 Reaction on Reviewers Comments

The first review took place 10th of June in Brussels. Overall the reviewer's had a good impression of the project.

The reviewers hinted some problem areas, and suggested corrections in the project. In this section we cite the respective comments from the reviewer's report and summarise the corrective actions taken in the FollowMe project:

Comment 1: the interfaces between components of the architecture are currently designed with too little detail, especially with respect to a classification of events that may trigger the execution of the interfaces; this may imply a risk of not being able to produce wide-scale reusable components by leaving in the end too much to the application level logic (is there a need for a stronger model of Agency?); *we would suggest to develop more tightly specified interfaces to invite the Consortium to take clear decisions with respect to what the limits of the FollowMe framework will be, and to keep focus only on issues which are within scope*;

The interfaces are defined in detail in the respective design documents. By the very nature of this project the interfaces are gradually refined, driven by the mutual requirements of the individual work packages. A finally documented version will be available in the SW report of each component.

Comment 2: we want to note that issues related to the use of existent databases and their typical interfaces (DDL, DMLs) do not seem to be addressed by the current architecture (e.g. Information Space);

The Information Space is an implementation of an logical object file system and as such is a layer on top of existing databases. Thus existing databases could be integrated although it does not have a major implementation priority.

Comment 3: there isn't enough visibility with respect to the evolution of deliverables in terms of contents and functions within the workpackages; this needs to be refined, because if, as it seems, a rapid application development approach is chosen, a strong configuration management and tight control over iterations (e.g. time boxing) to avoid the never ending loop problem is essential; *we therefore suggest the Consortium to explicitly plan for testable builds of components on one hand, and for specific versions of components to be integrated in both pilot applications on the other hand (an integration for each application should be planned before the next review)*;

As a reaction to this comment the *project implementation plan* was refined. It now extends the technical annex by a detailed description of the contents of each deliverable together with the availability and the effort estimated for each deliverable. It also shows the dependencies between the deliverables.

For each work package several releases (versions) of software packages are scheduled in the project implementation plan.

For the pilot applications the following releases are planed, that integrate the successively available results.

WP I: Bavaria Online Pilot Application		
Deliverable DI4.1: Working System	July 98	Integrates MOW (DB7.3/8.3), Information Space (DC5.1/DC6.2), User Access (DH5.2/6.2).
Deliverable DI4.2: Working System	Dec. 98	Additionally integrates Agent Framework (DD5.3/6.3, DE5.3)

WP J: ETEL++ Pilot Application		
Deliverable DJ4.1 Working System	July 98	
Deliverable DJ4.2 Working System	Dec. 98	Integrates all work packages

Guidelines for a project internal release management are defined.

Comment 4: the pilot application Bavaria-Online doesn't focus enough on real-word user requirements; *we suggest the Consortium to enhance the description and identification of user requirements that the application is expected to address*;

The Bavaria-Online pilot application is developed in close relationship with the "Bürgernetze". A formal co-operation agreement wrt. FollowMe between the Bürgernetze and FAST was already signed in Feb. 98. In reaction to this comments an requirements document supplement is produced that captures the results of the interviews carried out with users, information providers, and future operators of the services.

Comment 5: validation criteria are not explicitly defined at this stage: *we suggest the Consortium to define criteria to measure the success of how key technology is being used (e.g. improvements of the development process expected, as referred to in the Project Programme)*;

The success criteria are discussed on the 1st of October in the FollowMe Board Meeting

Comment 6: it isn't clear to what extent design patterns as they currently are will be of future use in the project; *we would therefore ask for visibility on examples of implemented patterns within the components (e.g. mobile object pattern) and suggest the Consortium to enrich and revise all patterns continuously*;

The purpose of the architecture document is changing during the project. The first version was just a repository of design concepts and requirements. The second version (presented at the review) was a structured list of design patterns recovered from the individual component design papers. The final version will serve as a repository of reusable design patterns, to document them for reuse after the project.

The architecture paper will be extended to give pointers to the implementation of the patterns in the software reports.

Comment 7: finally with respect to exploitation a strong dependency exists with the evolution of leading tools within the marketplace; we want to stress, however, that there must always be a point at which main market players provide tools which need to be complemented to overcome their limits; as such there must be scope for exploitation not only through consulting but by commercialisation of products; *we suggest the Consortium to clearly state all sources of revenue that are envisaged from supplying such add-ons based upon FollowMe concepts*;

The commercialisation of products (besides exploitation by consulting) will be discussed on the next board meeting. Some partners may submit to the EC a non-disclosed exploitation plan that states the planned exploitation strategy.

Comment 8: management and co-ordination is resulting particularly strong and well-organised; we feel however, from a reviewers point of view, that future evaluation of project progress would be facilitated by attaching a view on resource consumption with respect to effort planned *within* the period*; we therefore suggest the Consortium to use the model provided by the Commission and to attach an updated schedule (see Project Programme, §3.6) for the next progress review.*

The Periodic Management Report uses a model that is derived from the model proposed in the CEC document entitled "Checklist for the preparation of PPRs, and PMRs for RTD and Trial Applications Projects (V2.0 from 28/08/1996)". Both models do not consider the effort planned for a period, rather it gives the planed total effort, and the effort invested so far.

Indeed the effort for each task was not broken down to reporting periods. This can only indirectly derived from the starting and end date of each task. To take into account the reviewer's comments the effort planing is now broken down further to deliverable level. This makes it possible to compare planned effort for a deliverable to used effort.

4 Exploitation activities

A draft exploitation plan has been compiled. APM, FAST, UWE, and TCM have started individual exploitation activities. This section gives an overview to the individual exploitation activities of each company.

4.1 APM Exploitation Activities

Since APM's acquisition by Citrix effort has been spent on the investigation of product opportunities within the Citrix product range. This has involved a significant amount of work by the APM project members. However the exact nature of the exploitation is commercially sensitive. If details are required APM is willing to provide a separate disclosure to the commission or reviewers in an agreed format.

4.1.1   Publications

Papers were presented at:

- SIGOPS Workshop

- Middleware 98

- Mobile Agents 98

The first two presented the FlexiNet infrastructure use by the MOW and the second the mobile object workbench.

4.2 FAST Exploitation Activities

FAST plans to exploit agent based technology in further customer projects. Major target groups are financial institutions and public administration.

4.2.1   Presentations

FAST made a number of presentations to address potential customers.

Date, Location	Participants	Contents
13.1.98, Waldkraiburg	Representatives of the Sparkasse (savings bank) and Raiffeisenbank Waldkraiburg and of the Bürgernetze	Presentation of FollowMe portfolio pilot application and discussion of the involvement and future service to bank customers
26th and 27th of June, Munich	Bayern-Online Kongress	Presentation on FollowMe, and a stall organised by the Bavarian Bürgernetze at the exhibition

7th of July, Munich	Techno-Z CEO G. Kreilinger, Braunau (Austria)	Presentation of FollowMe, discussion of a pilot installation of an active call for tender data base.
17th of July, Munich	B. Gebauer, Vice President of the Dachverband der Bürgernetze	Discussion on potential extensions and commercialisation of the pilot application in 1999.
23rd of July, 22nd of Sept., Munich	Dr. Franzen, Bavarian Ministery of Interior, H. Göttlinger, CEO of Behörden-Online	Presentation of FollowMe and discussion on potential exploitation in public administration.

4.2.2   Publications

A publication for an overview to the bavaria-online pilotapplication was prepared.

4.2.3   Collaboration with other Projects

FAST is a partner in AgentLink, an EU sponsored initiative for the co-operation of agent based projects. FAST registered for the SIG on Intelligent Information Agents and participated on the formation meeting at the 24th and 25th of September.

FAST was invited to present FollowMe on the Climate (Cluster for Intelligent Mobile Agents for Telecommunication Environments) Workshop on Mobility on 5th of May. FollowMe is registered as an associated project to the Climate initiative.

4.3 UWE/ICSC Exploitation Activities

ICSC has started dialogue with a small Bristol based company that is developing Java applications for mobile Java enabled devices with a view to investigating possible collaboration on developing products. ICSC is also talking to the Transport Research Laboratory Ltd. in order to obtain near real time road traffic information so that ICSC can look at Agent based applications for the dissemination of road congestion reports to users.

UWE is participating in the AgentLink initiative.

4.4 TCM Exploitation Activities

The major targets of TCM exploitation plan, are Ouest-France and its partners of the French SPQR (Daily Regional Press Society). Because electronic newspaper will become a necessary and complementary channel to broadcast news, the design of Etel++ has been done in order to deliver a pilot application close to concerns of electronic press publishing.

TCM has present Follow-Me and especially Etel++ to the partners of the French SPQR. The first presentation in Paris (April the 1st) was an overall description of the concepts, the second one (13th of May) was done to address potential customers and to get their expectations in regard with their further project.

With the first prototype of Etel++, three presentations have been done:

Date, Location	Participants	Contents
23rd of September, Rennes	Ouest-France Antoine de Tarlé (vice-president) Jean-Paul Boucher (Technical Director)	Presentation of FollowMe Etel++ pilot application. Discussion about the commercial potential strength of these application in the press market
29th of September, Rennes	Atlantel (Multimedia Subsidiary of Sud-Ouest second major french regional daily newspaper after Ouest-France) Jean-Lois François (Director) Bernard Lafitedupond (Technical Director)	Presentation of FollowMe Etel++ pilot application. Discussion on potential extensions and commercialisation with their electronic newspaper.
7th of October, Rennes	Precom (Ouest-France's advertising production agency) Philippe Toulemonde(Director) Serge Fiedler (account executive)	Presentation of FollowMe Etel++ pilot application. Discussion of would be possible to show (promotional sale ...) when you move inside the Ouest-France's regional area. Potential cost of this service for advertiser

5 Deliverables

The following list shows the status of each deliverable as of 30/09/98. The status of the deliverables is either:

- *Internally available*: The deliverable was produced and distributed project-internally. It either serves as an internal basis for technical decisions and preparation of the further deliverables or is a software product that is distributed project-internally. Those deliverables are not handed over to the reviewers. But they can be made available on demand

- *available*: This piece of software was produced and distributed project-internally. These components were integrated in partner's software. These deliverables can be demonstrated and handed-over to the reviewers on request.

- *released*: The deliverable has successfully undergone a formal project-internal review process.

Some deliverables are rescheduled in order to take account the availability of required documents.

Deliverables that are already available are shown in grey:

Deliverable	*Name*	*Type*	*Month*	*Status*
DA1.1	Architecture Report	Report	2	Internally available
DA1.2	Architecture Report	Report	6	released
DA1.3	Architecture Report	Report	12	shifted to PM 15
DB1	Survey	Report	1	Internally available
DB2	Requirements	Report	2	released
DB3	Design	Report	3	released
DB4	Interface Specification	Software	3	released
DB5.1	O/S Objects	Software	4	Internally available
DB5.2	O/S Objects	Software	7	available
DB6.1	Object Locator	Software	4	Internally available
DB6.2	Object Locator	Software	7	available
DB6.3	Object Locator	Software	9	available
DB7.1	Mobile Object Workbench	Software & Report	4	Internally available
DB7.2	Mobile Object Workbench	Software & Report	7	Internally available
DB7.3	Mobile Object Workbench	Software & Report	9	internally

Deliverable	Name	Type	Month	Status
				available
DB7.4	Mobile Object Workbench	Software & Report	12	released
DB8.1	Mobile Data Ob ject	Software & Report	5	Internally available
DB8.2	Mobile Data Object	Software & Report	7	Internally available
DB8.3	Mobile Data Object	Software & Report	9	released
DC1	Requirements	Report	3	released
DC2	Design	Report	4	released
DC3	Interface Specification	Software	5	Internally available
DC4	Object Sharer	Software	9	available
DC5.1	User Authentication	Software	9	Internally available
DC5.2	User Authentication	Software	13	released
DC6.1	PIS Object	Software & Report	6	Internally available
DC6.2	PIS Object	Software & Report	9	released
DC6.3	PIS Object	Software & Report	13	released
DD1	Survey	Report	3	Internally available
DD2	Requirements	Report	4	released
DD3	Design	Report	5	released
DD4	Interface Specification	Software	6	released
DD5.1	Task Agent Shell	Software & Report	7	available
DD5.2	Task Agent Shell	Software & Report	10	released
DD5.3	Task Agent Shell	Software & Report	13	
DD6.1	Personal Assistant	Software & Report	7	internally available
DD6.2	Personal Assistant	Software & Report	8	released
DD6.3	Personal Assistant	Software & Report	10	shifted to PM 13
DD6.4	Personal Assistant	Software & Report	14	
DE1	Survey	Report	2	Internally available
DE2	Requirements	Report	3	Internally available
DE3	Design	Report	4	released
DE4	Interface Specification	Software	4	released
DE5.1	Profile Object	Software & Report	5	delivered
DE5.2	Profile Object	Software & Report	8	released
DE5.3	Profile Object	Software & Report	11	
DF1	Survey	Report	2	Internally available
DF2	Requirements	Report	4	Internally available
DF3	Design	Report	5	released
DF4	Interface Specification	Software	6	released

Deliverable	Name	Type	Month	Status
DF5.1	Service Shell	Software & Report	7	available
DF5.2	Service Shell	Software & Report	10	released
DF5.3	Service Shell	Software & Report	13	
DF6.1	Service Directory	Software & Report	7	shifted to PM 13
DF6.2	Service Directory	Software & Report	10	shifted to PM 13
DF6.3	Service Directory	Software & Report	13	shifted to PM 13
DG1	Survey	Report	3	Internally available
DG2	Requirements	Report	4	Internally available
DG3	Design	Report	6	released
DG4	Interface Specification	Software	7	available
DG5	Group Profile Analyser	Software	8	available
DG6.1	Service Deployer	Software & Report	12	shifted
DG6.2	Service Deployer	Software & Report	14	
DH1	Survey	Report	2	Internally available
DH2	Requirements	Report	3	Internally available
DH3	Design	Report	4	released
DH4	User Interface Language	Report & Software	5	released
DH5.1	Device Adapters	Software	6	internally avail.
DH5.2	Device Adapters	Software	9	available
DH5.3	Device Adapters	Software	13	internally available
DH6.1	User Access Module	Software & Report	6	internally avail.
DH6.2	User Access Module	Software & Report	9	released
DH6.3	User Access Module	Software & Report	13	internally available
DI1	Survey	Report	3	Internally available
DI2	Requirements	Report	6	released
DI3	Design & Objectives	Report	8	Internally available
DI4.1	Working system	Software	10	available
DI4.2	Working system	Software	15	
DI5	Evaluation Report	Report	18	
DJ1	Survey	Report	3	Internally available
DJ2	Requirements	Report	6	released
DJ3	Design & Objectives	Report	8	available
DJ4.1	Working system	Software	10	available
DJ4.2	Working system	Software	15	
DJ5	Evaluation Report	Report	18	
DK1	Agreement on IPR	Report, External	6	available (with DL 1)
DK2	Consortium Exploitation Plan	Report, External	15	first draft int.

Deliverable	Name	Type	Month	Status
				available
DL1	Consortium Contract	Contract	3	internally available
DL2	Project Progress Report	Report	6	released
DL3	Project Progress Report	Report	12	(this document)
DL4	Final Project Report	Report	18	

6 Next Reporting Period

The focus in the final reporting period is on the integration of all components in the pilot application and the improvement of the components.

Thus the final period concentrates on three issues

- The technical work package have finalised (WP B, C) or will (WP D, E, F, G, and H) finalise the technical implementation and carry on maintenance.

- The pilot applications (WP I and J) will integrate these components and build up the planned demonstrators.

- The documentation will be finalised. The architecture will be brought into a form to represent a repository of reusable design patterns, to document them for reuse after the project.

Annex: Table of Resource Consumption

In order to adapt the project plan to the actual needs of the project and to the availability of staf smoothing" of their effort across their tasks. This will not change the overall effort or the dates o discussed and accepted by the project board. The changes are reflected in an project implementation |

	Planned					Total	Used					Total	
Architecture													
NAME	*APM*	*FAST*	*INRIA*	*TCM*	*UWE*		*APM*	*FAST*	*INRIA*	*TCM*	*UWE*		
Scenarios	1,0	1,0	0,5	0,5	0,5	3,5	2,0	1,0	0,5	0,5	0,5	4,5	
Model Creation	4,0	1,0	0,5	0,5	0,5	6,5	2,7	1,1	0,5	0,4		4,7	
Total:	**5,0**	**2,0**	**1,0**	**1,0**	**1,0**	**10,0**	**4,7**	**2,2**	**1,0**	**0,9**	**0,5**	**9,2**	
Mobile Objects Workbench													
NAME	APM	FAST	INRIA	TCM	UWE		*APM*	*FAST*	*INRIA*	*TCM*	*UWE*		
Survey	1,0					1,0	1,0					1,0	
Requirements	1,0	0,5	0,5		0,5	2,5	1,5	0,5	0,5		0,6	3,1	
Design	2,0					2,0	3,4					3,4	
Interface Specification	2,0	0,5	0,5		0,5	3,5	2,0	1,0	0,5			3,5	
Implementation	14,0					14,0	11,1					11,1	
Tests	3,0					3,0	2,2					2,2	
Deployment	3,0					3,0	0,9					0,9	
Total:	**26,0**	**1,0**	**1,0**		**1,0**	**29,0**	**22,1**	**1,5**	**1**	**0**	**0,6**	**25,2**	

Personal Information Space

NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Requirements	0,5					0,5	0,5					0,5
Design	1,0					1,0	1,9					1,9
Interface	0,5					0,5	0,5					0,5
Implementation	4,0					4,0	4,5					4,5
Tests	1,0					1,0	0,8					0,8
Deployment	1,0					1,0	0,2					0,2
Total:	**8,0**					**8,0**	**8,4**	**0**	**0**	**0**	**0**	**8,4**

Autonomous Agents

NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Survey					2,0	2,0					2,5	2,5
Requirements	1,0				2,0	3,0	1,0				0,5	1,5
Design					3,0	3,0					3,2	3,2
Interface Specification					2,0	2,0					0,5	0,5
Implementation					16,0	16,0					8,9	8,9
Tests					3,0	3,0						
Deployment					2,0	2,0						
Total:	**1,0**				**30,0**	**31,0**	**1**	**0**	**0**	**0**	**15,7**	**16,7**

Personal Profiles

NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Survey					1,0	1,0					1,0	1,0
Requirements	1,0				1,0	2,0	1,0				1,2	2,2
Design					2,0	2,0					1,9	1,9
Interface					0,5	0,5					1,4	1,4
Implementation					5,0	5,0					2,5	2,5
Tests					1,5	1,5						
Deployment					1,0	1,0						

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Total:	1,0				12,0	13,0	1	0	0	0	8,1	9,1

Service Interaction

NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Survey					1,0	1,0					1,1	1,1
Requirements	1,0	2,0	1,0	1,0	1,0	6,0	1,0	1,9	1,0	1,0	0,9	5,8
Design					2,0	2,0					2,6	2,6
Interface					1,0	1,0					1,0	1,0
Implementation					5,0	5,0					3,3	3,3
Tests					1,0	1,0						
Deployment					1,0	1,0						
Total:	**1,0**	**2,0**	**1,0**	**1,0**	**12,0**	**17,0**	**1,0**	**1,9**	**1,0**	**1,0**	**9,0**	**13,9**

Service Deployment

NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Survey			2,0			2,0			2,0			2,0
Requirements	1,0	2,0	2,0	1,0	1,0	7,0	1,0	0,2	2,0	1,0		4,2
Design			3,0			3,0			3,0			3,0
Interface			1,0			1,0			1,0			1,0
Implementation			8,0			8,0			6,0			6,0
Tests			1,0			1,0			0,6			0,6
Deployment			1,0			1,0			0,6			0,6
Total:	**1,0**	**2,0**	**18,0**	**1,0**	**1,0**	**23,0**	**1**	**0,2**	**15,26**	**1**	**0**	**17,4**

User Access

NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Survey		2,0				2,0		3,5				3,5
Requirements		2,0				2,0		4,2				4,2
Design		3,0				3,0		4,3				4,3
Interface		2,0				2,0		2,5				2,5
Implementation		16,0				16,0		9,9				9,9

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NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Tests		3,0				3,0		1,0				1,0
Deployment		2,0				2,0						
Total:		**30,0**				**30,0**	**0**	**25,3**	**0**	**0**	**0**	**25,3**

Pilot Application 1

NAME	APM	FAST	INRIA	TCM	UWE		*APM*	*FAST*	*INRIA*	*TCM*	*UWE*	
Survey		2,0				2,0		2,2				2,2
Requirements		3,0				3,0		4,1				4,1
Design		4,0				4,0		1,1				1,1
Implementation		24,0				24,0		13,1				13,1
Deployment		6,0				6,0		0,7				0,7
Trials		9,0				9,0		2,9				2,9
Evaluation		3,0				3,0						
Total:		**51,0**				**51,0**	**0**	**24,0**	**0**	**0**	**0**	**24,0**

Pilot Application 2

NAME	APM	FAST	INRIA	TCM	UWE		*APM*	*FAST*	*INRIA*	*TCM*	*UWE*	
Survey			2,0			2,0			2,0			2,0
Requirements			2,0	2,0		4,0			2,0	2,0		4,0
Design			3,0	1,0		4,0			3,0	0,8		3,8
Implementation			21,0			21,0			14,7			14,7
Deployment			6,0	2,0		8,0			4,5	0,6		5,1
Trials			3,0	0,5		3,5				0,2		0,2
Evaluation			2,0	0,5		2,5						
Total:			**39,0**	**6,0**		**45,0**	**0**	**0**	**26,2**	**3,5**	**0**	**29,7**

Exploitation

NAME	APM	FAST	INRIA	TCM	UWE		*APM*	*FAST*	*INRIA*	*TCM*	*UWE*	
Exploitation	2,0	2,0	2,0	3,0	2,0	11,0	1,0	0,6		1,1		2,7
Total:	**2,0**	**2,0**	**2,0**	**3,0**	**2,0**	**11,0**	**1**	**0,6**	**0**	**1,1**	**0**	**2,7**

Project Management

NAME	APM	FAST	INRIA	TCM	UWE		APM	FAST	INRIA	TCM	UWE	
Projekt Management		9,0				9,0		6,8				6,8
Total:		**9,0**				**9,0**		**6,8**				**6,8**
Overall Total	45,0	99,0	62,0	12,0	59,0	277,0	40,2	62,5	44,5	7,4	33,9	188,5