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Follow Me White Paper

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1.1 INTRODUCTION

The Follow Me project has been presented as a proposal for funding under the European Commission ESPRIT programme, with the main partners being APM Ltd, FAST e.V. and INRIA. APM also acts as the lead representative for the ANSA research programme, under whose auspices this project is also running.

1.2 OVERVIEW

Life is currently becoming more and more difficult for the user of information. There are problems with both information overload and information inaccessibility. On the one hand, people need to keep control of information in many different formats - voice-mail, email, fax, bookmarks, word-processing documents, personal organisers, etc. - and the amount of data is also growing. On the other hand, because there is little opportunity to distribute this information, it becomes increasingly inaccessible - documents, email, etc. have either to be endlessly copied, or are accessible only from one computer, voice-mail can only be checked from a phone.

There is, however, a solution to these problems. This project will introduce a new paradigm to improve the accessibility and sharing of information to the user, in the context of global networks. It will -

- Demonstrate the benefits of server-based alternatives to desktop computing
- Couple distributed processing and agent technology to enable new network applications
- Explore the potential for new applications for users

1.3 CURRENT STATE

The issue facing people who wish to use information can be broken down into a simple dichotomy - they are mobile users, but they are working in global networks. The current paradigm of computer and information use does not deal well with this - the desktop workstation, monolithic and immovable, does not map to a global network. A new paradigm is needed to free the user from the tyranny of the desktop.

Mobile users have two main problems within the current paradigm -

- Due to their mobility, they cannot contact the desktop reliably. Even when they can, the protocols currently available are almost exclusively aimed at simple access of information, and not its use within applications.
- As they move, the access they have to devices for accessing information changes. This means that as information is spread between different devices - a laptop, a PC at home, a PC at work and voice-mail, for instance - the information has either to be duplicated across many platforms and devices, or faces isolation.

1.4 NEW PARADIGM

In a server-based paradigm, a user can connect to a server, which will adapt its communications with the user, based on device, location and other factors.

Understanding how global networks change the situation can lead to a new understanding of how to use information. In this environment -

- A great deal of information can be stored in many places, rather than on a single desktop. This enables it to be shared much more easily.
- Agent technology can be used to automate processes, giving agents autonomy away from the desktop, and enabling them to operate across the networks.
- A network infrastructure can be provided to enable agents to access information in a variety of different forms, for different platforms.
- Ways can be found to ‘invent’ new agents by observing the processes that are needed.

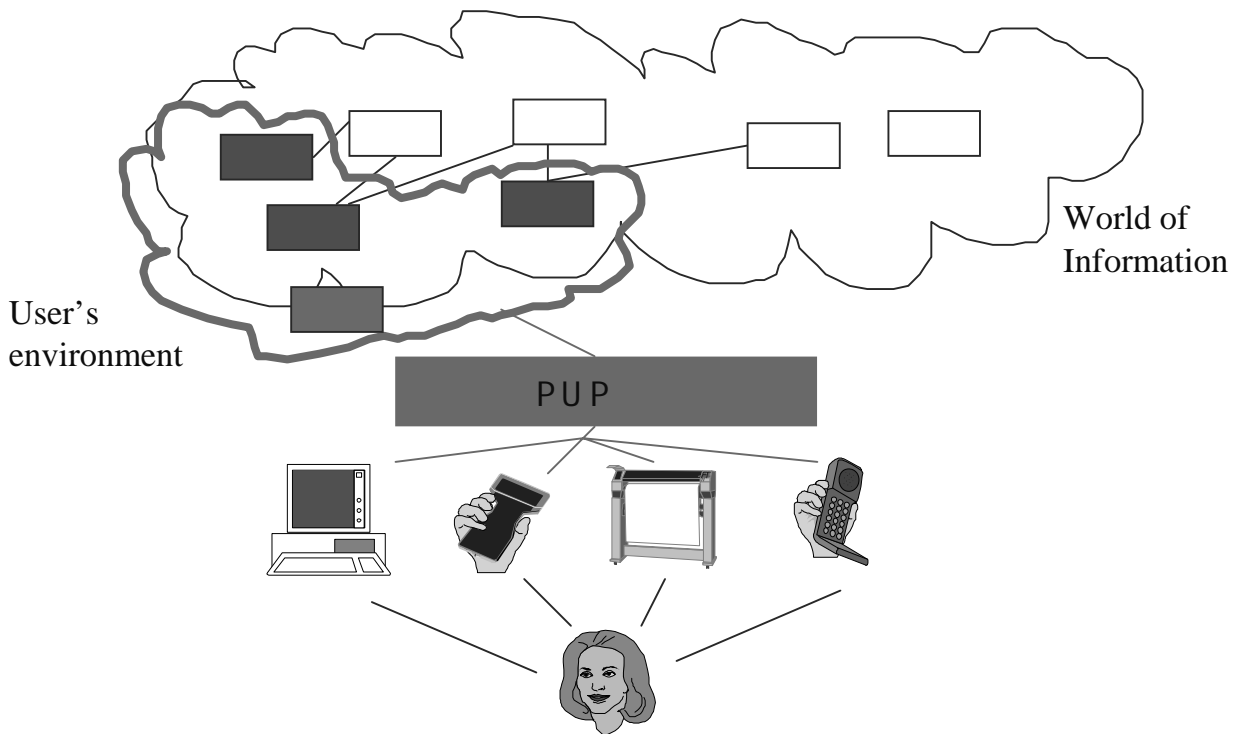
1.5 PROJECT OBJECTIVES

The aim of the project is to develop an architecture for designing “follow me” applications in globally distributed networks. This will be tested by implementing trial applications that confirm its suitability and demonstrate the benefits to the relevant industry sectors. From this work, the project will make key components widely available. The purpose of this “seedware” is to act as a catalyst for the new paradigm in computing, enabling it be general adopted and to act as the basis of ad hoc and industry standards.

1.6 BACKGROUND

The current user paradigm revolves heavily around the concept of a “home” workstation which is accessed via the facilities of the desktop. This limits mobility and restricts interactions to the form supported by that media. In the “follow me” paradigm, a users’ environment is located on an server-based network managed by a service provider. Access is obtained via device independent procedures which transform the data to a form suitable for the particular interaction.

Persistent User Profiles



In order to exploit this mobility and device independence, a user's environment is not simply a collection of references and data. By utilising a process-driven approach, the user is able to specify the objectives of their tasks. This provides the framework for agent technology to satisfy goals either individually or in collaboration with other proxies. In addition, understanding the reason why information has been obtained facilitates in the presentation and allows it to be tailored for different access media.

Such an approach is a powerful new computing metaphor. It creates the infrastructure that enables new services and facilities to be delivered. Access is provided via different media formats and in locations which are convenient to the user.

1.7 TWO PHASE OBJECTIVES

In the first phase of the project, an architecture which enables "follow me" style applications to be built will be explored and specified. This architecture report will form a deliverable and be the basis on which trial applications are designed and implemented.

1.7.1 ARCHITECTURE ISSUES

The key objectives of such an architecture are to provide a framework to:

1. Create and maintain a user's personal environment.
This provides the necessary infrastructure on an wide area server based environment to provide basic functionality and security.
2. Enable a process-driven approach to information management.

To design constructs which allow information processing tasks to be specified in terms of goals and objectives.

3. Employ agent technology to satisfy individual and collective objectives.
In an environment where a user's normal "home" is transient, agent technology offers numerous benefits. Tasks can be carried out after the user has disconnected. Similarly, agents have the ability to move locations or multiple in order to perform certain actions. For example, these might be search or collaborative tasks.
4. Provide media-independent interaction to a user's environment.
Essential to the concept of "follow me" is the ability to communicate with a user's personal environment via multiple devices and media. This could be through PC, NC, phone, fax, home entertainment, or indeed, a combination of these.
5. Facilitate user mobility, allowing access to normal facilities from all locations.
To enable efficient ubiquitous access to the system, it will be essential to derive policies and mechanisms for the internal migration and distribution of information. For example, if a user normally accesses the system from one location and moves to another, there needs to be a strategy for remote connectivity moving towards transfer of data.

1.8 Scenarios

From discussions with the users the following scenarios have been developed. These will provide input to the choice of demonstrator. In this proposal they provide a valuable overview of the user requirements which have driven the project proposal so far. The Puppy referred to in these scenarios is a Persistent User Profile, which retains information about the user, and is itself mobile.

1.8.1 Scenario 1 - Today's news - wherever I am

I have a range of interests and like to keep in touch with news. My personal Puppy knows what my interests are, and uses an agent to find information on subjects which are of interest to me. The basic information it provides may be gleaned from commercial news services, and the Puppy may authorise payment for some services, but other information may come from other sources on the Net - official sites or information servers, for instance.

My Puppy knows that I access information from a range of devices, and over time can learn my preferred access method in different situations. The Puppy formats the information according to the method by which I am likely to access it, and communicates that information to me. For instance, I may not be contactable via email over the weekend, but the Puppy could put together a 'magazine programme' which I could access via my television. If I am on a trip, the best method may be to fax the information to me, which would require very different formatting of the information - video clips would not be suitable, but in-depth editorial might be. The Puppy is aware of what formats are acceptable for which access-methods, and presents the information accordingly.

1.8.2 Scenario 2 - Meeting arranger

My Puppy has access to my diary, and can tell when I am available for different actions. However, I work with a team of people at work who regularly need to meet, so we have formed a 'federated' Puppy, which represents us. This Puppy has access to certain parts of my personal diary - it will notice, for instance, that I am booked out from work on Tuesday afternoon, but may not know that it is for a dentist's appointment. From time to time we need to have meetings with other people or groups of people, and the Puppies representing these people negotiate with our federated Puppy to arrange a time. The Puppy does this and arranges for my personal Puppy to update my diary.

1.8.3 Scenario 3 - Worlds on your desktop

Following the model of the federated Puppy in *Scenario 2* above, the company for which I work has a company Puppy. Although my personal Puppy does not have access to all details about the company, in the way that the Puppies belonging to the company CEO might do, there is certain information about the state of the company that the company Puppy can communicate to me via my personal Puppy. For instance, one of the duties of the company Puppy might involve project management. Although I am not involved in the day-to-day running of most of the projects in the company, it may well be of interest to me to see how they are progressing. The company Puppy provides graphical representations of how the projects are progressing; for instance, a globe, whose size represents the number of people working on the project, whose weather system reflects how close it is to completion, etc.. This information is taken from a variety of different systems, and may come from a variety of Puppies - my team's Puppy, for instance, may provide information about how well we are keeping to budget on our project.

1.8.4 Scenario 4 - Shopping

My Puppy has access to a shopping agent. As my Puppy knows what my preferences are for basic items, it can carry out a series of negotiations with one or more suppliers via the agent. It asks me if I have any particular requirements (or I can request its services if we have got low on particular items), and then contacts the suppliers. It works out the cheapest way to get all the shopping I need, possibly getting certain items from different suppliers, depending on the price at the time. It then looks at my diary and my partner's diary and sets a delivery time when at least one of us will be at home. Having arranged a delivery time, our diaries are updated.

1.8.5 Scenario 5 - Transport

I am making a journey which involves quite a long drive, and I wish to avoid traffic as much as possible. I tell my Puppy where I want to go, and when and the Puppy, using a route-planning agent, plans a route for me. Unlike most traditional route-planning methods, however, the agent that my Puppy uses negotiates with a traffic control system to decide the best route. Also, as my Puppy has communicated with the traffic control system, the latter now has more information that it can feed back and use to update forecasts of where traffic will be. In fact, the traffic control system may well be a federated Puppy of several different traffic control systems, which means that local traffic information can be accessed for other uses such as planning construction or road repair work.

1.9 PILOT APPLICATIONS

In order to demonstrate the viability of the architecture and to provide a catalyst for exploitation, two trial applications will be designed and implemented. These demonstration applications will be designed and built to work within the FollowMe environment. The proposed applications have been selected by the consortium members as a result of discussions with their end-user business clients (Ouest France, for example). Thus they represent real user needs.

The market is a dynamic one and the project partners wish to reserve the right to review these continuously as the project proceeds and modify or develop them as their business clients may advise.

1.9.1 Application 1 - Etel++

Etel is a project currently being run by TC Multimedia, in association with INRIA, to provide users access via ISDN networks to an electronic version of the *Ouest France* newspaper. Etel++ will extend this project, allowing users to access the newspaper via the Internet, viewing information of interest to them from a wider variety of locations and devices. This will be achieved by dynamic customisation of user profiles, taking into account:

- the location of ETEL users,
- the management of user accesses from a variety of location using diverse access points,
- the use of the agent technology including the management of agent co-operation,
- the management of data access integrating mobility aspects.

1.9.2 Application 2 - User profiles for Bavaria online

Bavaria Online, whose Internet Service Provider is IZB, currently offers a wide range of services, from freight logistics to financial services, share dealing to health information. Many of these services are, however, static, and the aim of the second demonstration application is to extend some of these services to allow them to interact with user profiles to provide customised services. Creating an infrastructure in which the profiles can interact with the services, the system will allow better service at both the service and demand ends of the supply chain.

1 .10 INDUSTRIAL RELEVANCE

1 .10 .1 TELECOMS POTENTIAL

The project opens new possibilities in terms of features and facilities that can be offered. Moving from a desktop environment to a network server based infrastructure provides opportunities for a variety of industries. For example, telecommunication companies are locked in a spiral of providing connectivity for ever decreasing margins. This project enables a new infrastructure paradigm where services and networks are intrinsically linked. This provides exploitation possibilities for Information Service Providers and also software developers and consumer electronics manufactures.

1 .10 .2 OTHER INDUSTRY SECTORS

An aim of the project is to provide the architecture and provide the basis for exploitation. Although two trial applications have been chosen to prove its viability, there are numerous other areas where this new paradigm can be applied.

Some examples are:

- Health - sharing of information between users in many locations, access to information from a variety of sources by mobile users (doctors on emergency calls, ambulance crews, disaster planning).
- Travel - availability of flights, hotels, etc. to users in many locations, using different methods of accessing the information, then allowing them to order via agents with access to financial services.
- Marketing & Sales - providing information to mobile users which can then be shared with customers, allowing ordering from a variety of platforms and locations
- Media and Publishing - access by collaborating users to common bases of information, both read and write, movement between different information types (word-processed document to printing format), information sourcing controlled by agents
- Banking and Finance - access to information in a variety of formats, shared between many users in many locations
- Support and Engineering - providing information to users 'in the field', sensitive to their needs, sharing the information if several people are working on different parts of a system/project.

1 .11 CONCLUSION

The project opens a new paradigm in personal information environments. It will deliver an architecture enabling new services and facilities to be realised. Users will have ubiquitous access to a system that enables them to specify objectives and interact using a variety of different media.

This architecture will be explored and validated through trial application projects. These applications will be specified and evaluated by a specialised user group. The systems will demonstrate the potential of this project and act as a catalyst for exploitation.